



RESEARCH ARTICLE

Managing obesity with lifestyle modification, outcomes, and recommendations

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ABSTRACT

Introduction: Obesity is a chronic illness affecting people from all regions and socioeconomic classes. Body Mass Index (BMI) is the measure used to define overweight and obese individuals. A BMI between 25 to 29.9 is considered overweight and more than 30 is considered obese. The prevalence of obesity has increased drastically in the last few decades making it an important health problem worldwide.

Objectives: The objective of this research paper is to identify various recent scholarly sources that focus on the importance of lifestyle modifications in the prevention of obesity and associated illnesses.

Methods: The articles were searched using databases such as PubMed, NCBI, UpToDate, BMJ, and other sources. The keywords used were obesity, overweight, lifestyle modifications, dietary modifications, exercise, modifiable factors, and other related words. Articles published after 2000, those with a high number of citations, larger sample size, experimental evidence, and done in larger institutes were selected.

Results: The studies provided evidence that lifestyle modifications as the most important factor in the reduction of overweight and obesity. Dietary modifications such as low-calorie, low-carbohydrate, Mediterranean diet, etc., done regularly or intermittently helped in weight loss. Exercise and physical activity were identified as the second-best interventions for weight management. Additionally, behavior and cognitive therapy is another intervention. The research paper also identifies outcomes of lifestyle modifications and the challenges and barriers faced by individuals.

Conclusion: Obesity can be successfully reduced by modification of dietary habits, improving patient-physician relationships, educating the masses about management strategies, and most importantly, inculcating more physical activity in daily life.

Introduction

The role of being overweight in causing mortality and morbidity to the general population dates back to the time of Hippocrates, more than 2500 years ago. Obesity has been known to the medical profession as a significant factor for bad health outcomes for centuries. The criteria for defining overweight and obesity have been refined after comparing the weight of a person with their height, which is known as Body Mass Index (BMI). It compares a person's weight with the weight of normal people in society. It is generally accepted that a BMI of 25 to 29.9kg/m² is defined as overweight. A BMI above 30kg/m² is defined as obesity and more than 35kg/m² is defined as severe obesity⁽¹⁾. This method of defining obesity is quite useful in determining the general idea of obesity, but its effects on the health of a person vary considerably from one individual to another. WHO defines obesity as the abnormal accumulation of fat that causes bad health outcomes. Obesity is a chronic disease that is increasing worldwide and causing significant morbidity in various regions. Globally, it is estimated that roughly 604 million people have obesity, which has doubled since 1980 in 70 major countries and is increasing significantly in others as well.

Globally, the changes in individual lifestyles have been attributed to the observed significant increase in obesity prevalence rates. The individual dietary patterns have significantly changed from natural and organic food sources to processed and fast foods. Moreover, the lack significant physical activity in individuals' daily routines equalizes calories' input and output, and has been acknowledged as a key risk factor for obesity. Regardless of these correlations between lack of physical activity, lifestyle changes, and obesity development, there is a staggering lack of education about the importance of keeping oneself fit and healthy, especially among people from middle and low-income countries. Notably, after the Industrial Revolution, people's daily lives were at a fast pace, which required machines rather than physical energy. This modification immensely

altered the work pattern of individuals, giving rise to a sedentary lifestyle and ultimately resulting in obesity and its associated complications.

Owing to the above observation, the present literature review seeks to establish the significance of lifestyle modifications with regard to prevention of obesity and related illnesses. To attain this objective, the researchers aim to search, identify, and evaluate various journal published research articles that have focused on the correlations between lifestyle modifications and obesity prevention/management. Thus, this study is particularly focused on determining the role of lifestyle changes in preventing obesity by backing up with the recent studies available in the literature.

Methodology:

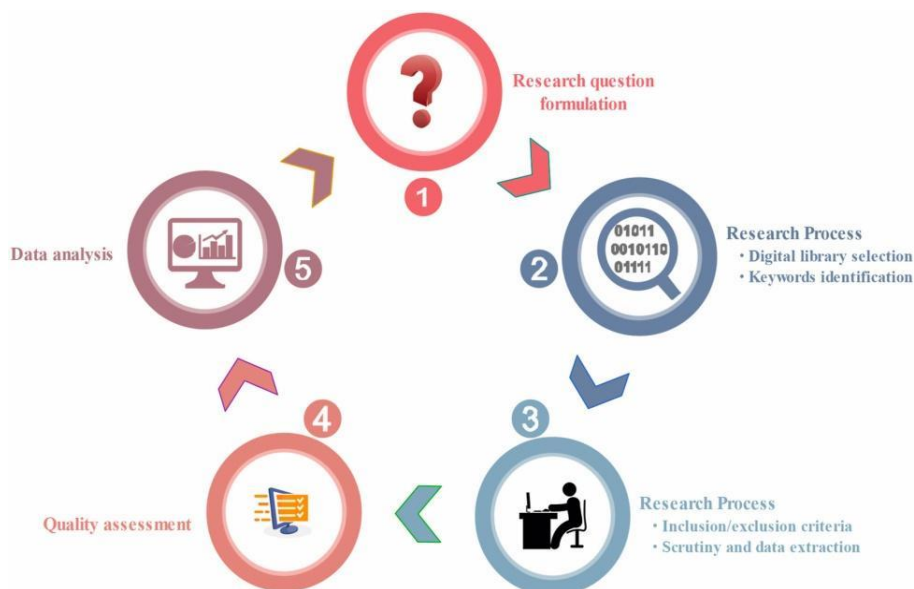
For this study, a literature search was conducted for primary studies that have focused on the effects of lifestyle modifications on obesity prevention. To attain this objective, the search was conducted on various online databases that were selected based on factors that included authenticity and updated information. The databased searched included PubMed, NCBI, Google Scholar, and BMJ. Further, the researchers additionally searched the trials registry (clinicaltrials.gov) for ongoing studies on obesity and lifestyle modifications. The reference lists of the selected studies and articles were further screened for identification of pertinent reviews and also for identification of other studies not found through the search on electronic databases. To identify the pertinent articles for this literature review, the researchers utilized various keywords that included "overweight," "obesity," "lifestyle modifications," "dietary modifications," "exercise," "modifiable factor," and other related words.

Further, the inclusion and exclusion criteria were set based on the article's publication time. For instance, the inclusion criteria for the literature entailed articles published between 2000 and 2024. Only articles published in English language were included. Also,

the inclusion criteria entailed articles that focused on various interventions aimed at preventing or managing obesity, including dietary interventions, exercise/physical activity interventions, behavioral therapies, and combinations of any of the listed interventions. Consequently, the exclusion criteria entailed articles research articles published before 2000, Articles published in languages other than English were also excluded. The exclusion criteria

also took in opinions, editorials, and dissertations. The selection of studies was usually done based on experimental evidence. Studies with large sample sizes were selected as compared to those with small sample sizes. Those studies were preferred and were done under the supervision of well-known institutions and hospitals. The whole methodology process is summarized in the figure below.

Figure 1: Summary of the research methodology in the literature review



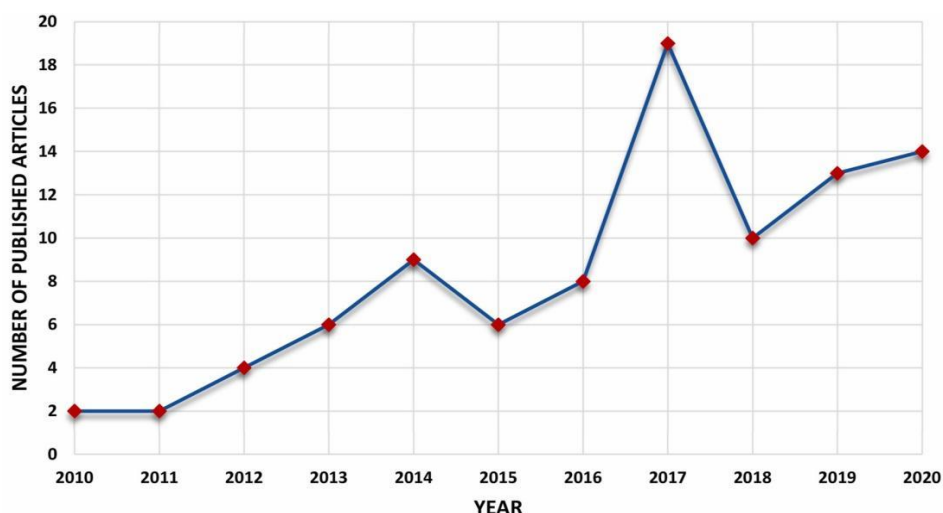
Discussion

Overview of lifestyle modifications:

Lifestyle modifications include those specific activities that can certainly enhance the weight control strategies of any individual. These modifications can help in effective weight reduction for overweight

and obese individuals and can help maintain the already fit individuals^[2]. There is a whole spectrum of such modifications that can play a vital role for someone targeting a reduction of weight. The number of articles published regarding obesity in different years is depicted below in Figure 2.

Figure 2: Temporal view of the published articles^[3].



Dietary habits are considered as the most important factor in the weight control of the individual. The world's food environment has dramatically changed over the past 70 years. In the past few years, studies have been done to classify diets as high-calorie and low-calorie diets. These diets can be defined as beneficial and hazardous for the body, especially in weight control strategies. The weight control strategies may include a low-calorie diet, low-carbohydrate diet, Mediterranean diet, etc^[4]. These can be taken regularly, continuously, and sometimes

at controlled intervals, known as intermittent fasting. Increasing exercise and other physical activities is the second-best intervention for patients targeting weight loss^[5]. It starts from basic approaches like walking and jogging daily for a certain distance, which is then increased systematically to achieve certain weight targets. It is a very effective and natural way of reducing weight and achieving agility in the body. The recommended guidelines mentioned in the literature are summarized in the table below^[6].

Table 1: Shows a high-intensity comprehensive lifestyle intervention to achieve and maintain a 5–10% reduction in body weight.

Component	Weight Loss
Frequency and duration of treatment contact	14 or more in-person counseling sessions in 6 months with a trained interventionist (individual or group contact). <i>Similarly structured, comprehensive web-based interventions, as well as evidence-based commercial programs may be recommended.</i>
Diet	Low-calorie diet (typically 1200–1500 kcal/d for women, 1500–1800 kcal/d for men), with macronutrient composition <i>based on patient's preferences and health status</i> . [‡]
Physical activity[±]	≥150 min/wk of aerobic physical activity (e.g., brisk walking).
Behavior therapy	Daily monitoring of food intake and physical activity, facilitated by paper diaries or apps. Weekly monitoring of weight. Structured curriculum of behavior change (e.g., DPP), including goal setting, problem solving, and stimulus control. Regular feedback and support from a trained interventionist.

There are many studies done over a long period that show the effectiveness of physical exertion in achieving required weight targets^[4,7]. There has been a clear understanding in the general population regarding the usefulness of exercise in this regard. Exercise modalities can involve the whole body, like jogging and running, or can target specific muscles and regions, like abdominal fat reduction, lowerbody fat reduction, and increasing core strength etc. The recommended exercises were different according to the age and configuration of the population and

even varied from one individual to another^[4]. Overall, it is accepted that 40 to 240 minutes of running or brisk walking per week can significantly reduce the weight of an individual combined with dietary modifications^[8]. The combined weight loss and resistance training is most effective in older adults as compared to the younger population^[8]. In addition to weight loss, exercise is also helpful in maintaining the approached weight. It helps prevent the weakness in the body, which is caused by dietary changes.

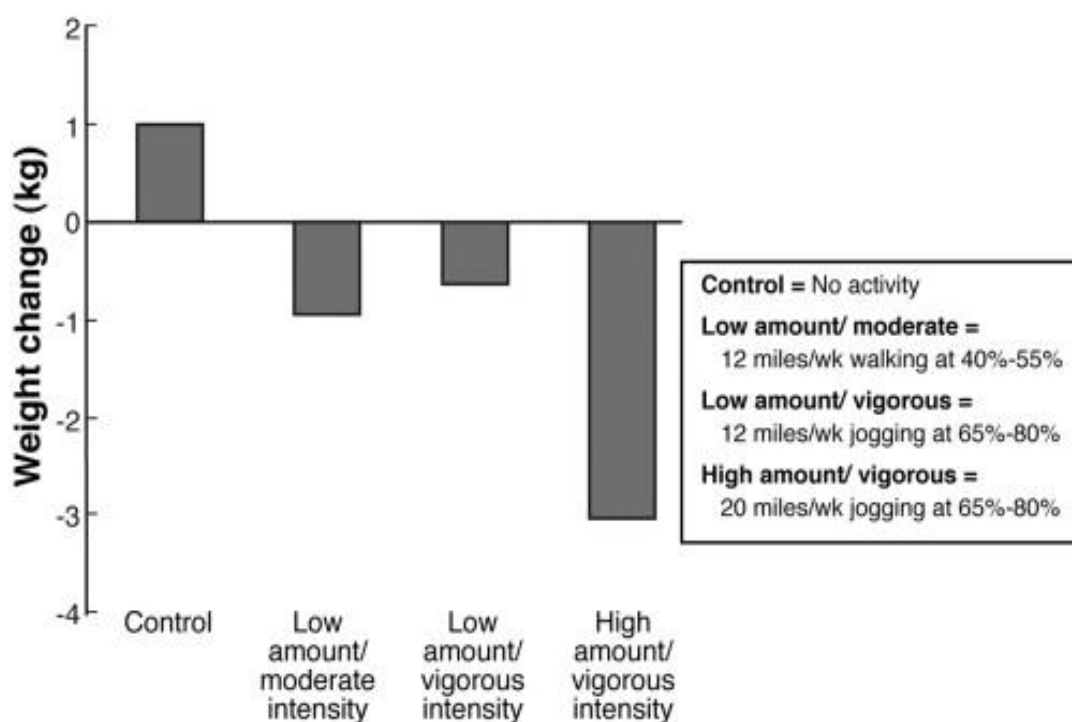
In addition to that, some behavioral and cognitive therapies are also employed to decrease the weight of the individual. Obesity, indeed, has a hormonal and genetic basis. However, some changes in the behavioral patterns of eating and physical activities played a significant role in achieving a healthier weight in individuals^[2]. It is very commonly known that people lack the motivation to achieve healthier weights when subjected to vigorous exercises and dietary stoppage so it is necessary to have counseling and motivation sessions which can enhance their motivation levels and change their approach towards a healthier lifestyle^[2]. Some of the essential components of behavioral modifications include self-monitoring, control of stimuli, slower eating, setting of specific targets and how to achieve them, behavioral contracting, education, and social support from relatives or peers. All these approaches have been proven to be effective in multiple different studies^[4,5,9]. Recently, people have been using smartwatches, bands, mobiles, and trackers to keep track of their activities and eating habits. There is not much literature available on the effectiveness of such apps, but some studies prove that there is long-

term weight control when tracking is done with these apps. They help provide strategies for weight control and keep a record of a person's activity. Their effectiveness is usually achievable when the individual follows the required plans religiously^[10].

Outcomes of lifestyle modifications:

The outcomes of lifestyle modifications are vast, and many studies have proven that they are amazingly effective in reducing and controlling weight, diabetes, hypertension, and other associated illnesses. Lifestyle modifications provide a short-term reduction in weight, diabetes, and blood pressure^[9]. A comprehensive weight loss program includes multiple short bouts of physical activity rather than a long bout. It is effective in decreasing blood glucose levels as it helps reduce insulin resistance in the body. It provides better glycemic control, cholesterol levels, blood pressure readings, and a healthier lipid profile^[11]. All these factors are combined to produce an overall healthier lifestyle for any individual. The figure below shows the effectiveness of different exercise intensities in weight reduction.

Figure 3: Comparison of intensity of exercise and reduction in weight



The long-term effectiveness of these strategies includes a stable, non-fluctuating weight and a decrease in the risk of many life-threatening diseases^[12]. There is a lot of specific evidence regarding the decrease in the risk of developing diabetes, hypertension, and other metabolic disorders. They are also helpful in decreasing the chances of developing obesity and other chronic sinister diseases that can affect any organ of the body in the long run^[7]. Behavioral therapies are also effective in achieving short-term and long-term goals. Modern technologies have also transformed the deliverance of such services to the needful and have created a fast and effective environment for patients to approach their health provider at any time.

Challenges and Barriers:

There are multiple challenges associated with the weight control strategies and programs. The most important of them is the patient's adherence to the devised plan and the measures to be adopted. The fast-paced life of today's world does not give much time for individuals to perform physical activities to control their weight. Most of the occupations in today's world involve sitting and performing tasks that do not involve any physical exertion. This lifestyle creates time management issues, leading to difficulty performing physical exertions. Some socioeconomic factors also play a significant role in the management of obesity. Some people cannot afford to consult a physician to manage their obesity^[13]. Many people in low and middle-class countries are uneducated about maintaining a healthy weight. On the other hand, the dietary cultures of the higher income countries are extremely unsuitable for managing a healthy weight^[14]. People in these countries' work patterns contribute massively to their disturbed eating patterns and timetables. Fast food culture is contributing a lot to making people obese in these countries^[9]. Some people in poor countries do not have access to healthy diets as prescribed by physicians for managing obesity. Peer pressure also plays an important role in effectively managing obesity^[15]. Society plays a pivotal role in the

management of overweight and obesity. Psychosocial factors are also important in the creation of a healthy environment for the management of overweight. Medical practitioners and healthcare workers are also not formally trained in the management of obesity^[15]. They are unable to provide effective management techniques to patients regarding diet plans, duration, and exercise type. Due to this, patients are subjected to consult some quacks and pseudo trainers that misguide and mistreat them. It is also important for clinicians to "medicalize" obesity and consider it a proper disease rather than just considering it a result of the lack of willpower of the patient and surrounding society. Counseling of primary care physicians regarding obesity is also not done as considerably as for the other diseases^[14]. It is due to the physicians' perceived notion that obesity is the problem of the patient himself. It is also noted that the physician's weight is important for the patient to understand the methods mentioned by the physician effectively. The general perceptions regarding obese patients and thinking that physicians cannot change the behavior of the patients regarding weight management are also considered valuable in the general management of obesity^[7]. The cost of a healthy diet and comorbidities associated with the use of medications for the management of obesity also pose a significant barrier in the management of overweight individuals^[15]. Some patients also opt for Bariatric Surgeries to remove the excess body fat in case of extreme obesity. Still, these surgeries pose a greater threat to the patients and are not recommended by physicians. All in all, it is concluded that many problems are still prevalent in society regarding the management of obesity, whether on the part of physicians or the side of the patient. These problems need a more careful approach if society needs to eliminate obesity.

It is identified in the literature that the most effective management of obesity is a wholesome package of weight management consisting of diet, exercise, family support, correct knowledge, and effective practices, which can vary from patient to patient.

There is still a need for more research regarding obesity as it can cause multiple other chronic diseases. Region-wise research is necessary, and correct factors must be targeted for specific populations and their special ways. Newer criteria are needed to correctly identify the level of obesity and the best possible methods to treat it. Future research needs to focus on genetic causes and treatment of obesity, which will become the most effective and non-invasive method. Correct and evidence-based education of the physicians, healthcare providers, and even patients must be done in different conferences, seminars, and media campaigns. Focused training of all physicians should be done at all levels so that patients are managed effectively at all levels and regions.

Conclusion:

Obesity is a widespread problem in today's world not only in low-income countries but also in the resourceful countries of the modern world. The dietary habits of the people of these countries need to be revitalized and reconsidered to achieve long-term goals in the management of overweight. Cultural and societal habits are the backbone of weight management in every part of society. The interpersonal relationship between the patient and physician is also important in determining management outcomes. It is important to educate the masses to consider the problem of overweight as a proper disease and procure the best health advice regarding its management. Inculcation of physical activity in the daily lives of all individuals is the takeaway of literature regarding the management of obesity.

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All authors declare no conflicts of interest.

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Author contribution:

All authors played several overlapping contributory roles such as: Conceptualization, design, cross-referencing, and fact-checking; Formal Analysis and interpretation of data; project administration, curation, visualization, writing – original draft, writing – review & editing; supervision, oversight, and leadership, correspondence, data curation, quality control, internal review, communications, data collection and archiving, software, literature search, validation, and approval.

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