

Evaluating the Effectiveness of Nutrition and Exercise Interventions in Adults with Chronic
Obesity

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It is hereby recommended that the project prepared by Robert Englehart entitled Evaluating the Effectiveness of Nutrition and Exercise Interventions in Adults with Chronic Obesity be accepted in partial fulfillment of the requirements for the degree of Master of Science in Healthcare Administration.

THESIS/PROJECT APPROVED by

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Table of Contents:

Abstract.....	5
Dedication.....	6
Acknowledgments.....	7
Introduction.....	8
Background.....	9
Problem Statement.....	11
Purpose Statement.....	12
Significance of Study.....	12
Definition of Terms.....	13
Capstone Research Question.....	15
Hypothesis.....	15
Literature Review.....	16
Research Methodology.....	24
Limitations.....	24
Ethical Issues.....	26
Results.....	28
Discussion.....	32
Conclusion.....	33
References.....	34
Appendices.....	40

List of Tables & Figures:

Table 1- BMI Bodyweight Ranges.....14

Figure 1- Obesity prevalence in Adults by age and sex.....17

Figure 2- Obesity prevalence by sex and education level.....19

Figure 3- Appendix A.....41

Figure 4- Appendix B.....42

Abstract:

This graduate project examines the extent to which nutrition and exercise interventions reduce body mass index (BMI) and improve functional mobility among American adults with chronic obesity. A literature-based research design was used to identify and assess peer-reviewed studies published between the years 2013 and 2025 that evaluated different lifestyle and behavioral interventions. The data collected was public information with no individual privacy concerns. The project also explored administrative implications for integrating these strategies. A hypothesis is used to test whether or not exercise and nutritional interventions are effective in reducing body mass index and improving functional mobility. Findings from the reviewed studies suggest that interventions are effective in reducing both BMI and improving functional mobility. Specific results varied depending on the individual and the method of intervention being tested. The findings consistently showed that combining nutrition and physical-activity methods produced more consistent improvements in weight and mobility outcomes than single-component programs. A significant barrier to positive results was found to be long-term adherence. The findings suggest the need for future research on more specific variables, including the long-term use of medication for weight management.

Dedication:

I would like to dedicate the completion of this paper to my family first and foremost, for always pushing me to be the best I can be. They have always been there when I need them the most to love and support me. To my mother and father, I always promised that one day I would make you proud and that this day would come when I finish school, and it is finally here. Grandpa John, you taught me so much and I wish you were still here to celebrate the completion of my degree. Lastly, I would like to dedicate this paper to my golf coach here at UAFS- Daniel Hayden. Coach Hayden, without you I certainly would not be in the position I am in today and for that I am very grateful.

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I would like to thank Dr. Dockins personally for pushing me in the final semester of my graduate studies. He helped me out greatly by pointing me in the right direction with this project. I would also like to thank the University of Arkansas at Fort Smith and all of the other professors in the Healthcare Administration program that have had their hand in helping me get to where I am at. I would like to especially thank Dr. Holden for her kindness, guidance, and direction during my time in the program.

Introduction:

The landscape of healthcare is one that is never the same from year to year. It is constantly changing, whether it be slight changes or major changes. This is driven by patient needs, changing policies, regulations, new information, emerging medical practices, and advancing technology. From a general standpoint, the population being treated is always changing and therefore has changing needs.

One of the most common forms of change for every individual is simply aging. As adults age, their prevalence of chronic conditions rises and therefore they require greater assistance from the healthcare system. In certain scenarios, conditions arise for a population, not from age, but from other factors. Obesity is one of the current conditions that has been increasing in recent years. While obesity is not necessarily a sole byproduct of aging, it is however a large part of the current challenge to healthcare providers. Current data shows that more than 40% of American adults now meet the clinical criteria for obesity (Emmerich et al., 2024). This burden has increased steadily over the past several decades, reflecting broader global shifts in dietary patterns, physical activity, and chronic disease epidemiology (Hruby & Hu, 2015). Because obesity is closely linked to type 2 diabetes, cardiovascular disease, diminished functional status, and premature mortality, its continued rise carries serious implications for healthcare systems.

In order to effectively address the population struggling with obesity, it is necessary to identify the root causes behind the issue. Once the main factors that cause obesity are identified, healthcare administrators and practitioners can do a much better job of forming, suggesting, and implementing solutions. For administrators, the significance of obesity extends beyond clinical outcomes. Individuals with obesity incur disproportionately higher medical expenditures and many other struggles that make health inequities worse. Not only that, but individuals with obesity have an increased risk of nearly every other chronic condition from diabetes to poor

mental health(Hruby & Hu, 2015). Given the rising prevalence of obesity and its clinical and economic consequences, healthcare organizations face a growing need to implement effective and sustainable management strategies. This analysis aims to investigate and identify factors that lead to obesity and the overall effectiveness of different interventions.

Background:

Obesity has evolved into one of the most significant chronic health challenges in the United States, with prevalence nearly tripling over the past five decades and now affecting more than 40% of adults nationwide(Hruby & Hu, 2015). The literature suggests the upward trajectory contributes to the development of chronic diseases including type 2 diabetes, cardiovascular disease, mobility impairment, and osteoarthritis. As chronic disease associated with obesity continues to rise, so does the utilization across emergency, inpatient, and preventive care settings. This contributes to national expenditures related to obesity now exceeding \$170 billion annually(Hruby & Hu, 2015).

Beyond direct medical costs, obesity creates substantial indirect economic burdens through reduced workforce productivity, disability claims, and early mortality. These consequences influence reimbursement structures, workforce planning, and long-term sustainability of care delivery. From a systems perspective, obesity represents a population-health challenge requiring coordinated, evidence-based strategies rather than episodic treatment.

Obesity affects certain populations differently, with disparities tied to race, ethnicity, socioeconomic status, and geographic location. Communities with limited access to quality foods or safe environments for physical activity experience elevated obesity risk (Drewnowski et al., 2020). Those in low and middle class face a double issue of malnutrition as well as obesity(World Health Organization, 2025). These factors have the ability to compound the

chronic disease burden and widen health inequities, highlighting the need for interventions that address both clinical treatment and specific social factors.

Long-term weight management is a serious challenge. Behavioral, nutritional, and medications can all assist with short-term results, but sustaining the weight loss over time is still a difficult challenge itself. Weight reduction leads to physiological changes such as decreased resting metabolic rate and increased hunger signaling (Most & Redman, 2020). These physiological changes are also serious and difficult to manage.

Recent advances in pharmacotherapy—most notably GLP-1 receptor agonists—have introduced new possibilities for clinically meaningful weight reduction in adults (Ng et al., 2025). However, these medications present certain limitations including cost, insurance restrictions, and high discontinuation rates (Berg et al., 2025; Rodriguez et al., 2025). As a result, current evidence supports combining pharmacotherapy with lifestyle modifications such as nutritional counseling, supervised exercise, and behavioral support to help ensure long-term outcomes (Bellicha et al., 2021; Eglseer et al., 2023).

Collectively, these trends show the magnitude of the obesity epidemic and the pressures it places on healthcare systems, communities, and individuals. Projections predict obesity to continue to rise in the future, peaking between 2030 and 2050 (Janssen et al., 2020). With obesity likely to still be a burden in the future, it reinforces the importance of healthcare organizations implementing changes capable of meeting the needs of their patient populations.

Problem Statement:

The healthcare system within the United States has been under serious stress from the burden of chronic disease in recent years, including the issue of obesity. Despite decades of clinical guidelines emphasizing nutrition education, physical activity, and preventive lifestyle interventions, obesity rates in the United States continue to rise, contributing to higher prevalence of type 2 diabetes, cardiovascular disease, osteoarthritis, and mobility impairment. This issue is driven by a variety of factors such as limited access to healthy food, safe spaces for physical activity, and increased sedentary behaviors in modern life. Even though the rising level of adults with obesity creates an array of problems currently, it could become much worse if the levels keep rising in the future. In the U.S. specifically, some projections predict over 85% of adults being overweight or obese by 2030(Hruby & Hu, 2015).

Evidence-based interventions do exist, but many adults do not receive consistent or sustained lifestyle support within healthcare settings. Barriers include limited access to preventive services, inconsistent provider counseling, socioeconomic challenges, and fragmented care delivery that prioritizes acute treatment over long-term weight management.

At the same time, healthcare organizations have implemented a variety of behavioral, educational programs, yet these initiatives often remain inconsistent, resource-dependent, and insufficiently scaled. Pharmacologic treatments such as GLP-1 receptor agonists show promise but face challenges related to cost, accessibility, treatment discontinuation, and long term effects. Consequently, lifestyle interventions-despite their foundational role-are not being deployed at an intensity or scale sufficient to improve population-level outcomes.

There is recent research on which combinations of structured nutrition and exercise interventions most effectively improve BMI and functional mobility among adults with chronic

obesity. Furthermore, there is not much research about how healthcare administrators can feasibly implement and sustain interventions within real-world clinical environments.

Purpose Statement:

The purpose of this study is to research the issue of obesity and evaluate which lifestyle factors influence the prevalence and severity of this disease. The research will search for evidence concerning the effectiveness of nutrition and exercise interventions for reducing BMI and improving functional mobility in American adults with this chronic disease. The goal of the research is to help the overall understanding of how interventions can affect quality of life within the American population. Along with that, this study aims to identify strategies that healthcare administrators can potentially use to integrate these interventions into daily practice and therefore help change patients' lives for the better.

Significance of Study:

With obesity continuing to pose a challenge for healthcare organizations and individuals across the United States, the findings of this study carry significance for many different grounds and individuals. For example, those involved in patient care, population health management, or those interested in the topic of obesity in general would benefit from reviewing this project. By examining the effectiveness of nutrition and exercise interventions, this study provides valuable insight for patients or providers struggling with managing obesity and its associated comorbidities. Along with that, understanding the combinations of interventions that have the potential to yield the most meaningful improvements in weight and functional mobility enables clinicians to deliver more tailored, evidence-based treatment plans to enhance patient outcomes and reduce long-term disease burden.

For healthcare administrators, this study may help guidance with designing, scaling, and sustaining comprehensive obesity management programs within real-world clinical environments. Administrators are responsible not only for ensuring effective care delivery, but for navigating financial constraints, staffing models, resource allocation, and quality control- all areas that obesity has the potential to affect. The insights from this study could be useful for decisions regarding program funding, staff training, and evaluation metrics that promote equitable access to obesity care. Ultimately, this study contributes to the collective effort to reconceptualize obesity as a chronic disease that requires long-term support, care, and attention rather than short term fixes or brief counseling.

Definition of Terms:

Obesity: A chronic complex disease defined by excessive fat deposits that impair multiple areas of health. A BMI of 30 or higher indicates obesity(WHO, 2022).

Chronic Obesity: Chronic Obesity refers to long-standing, persistent obesity for an extended period of time rather than a temporary weight fluctuation.

Body Mass Index(BMI): Body Mass index is a calculation that is measured by dividing someone's weight by their height. This calculation is used to determine a person's weight classification whether underweight to obese(USAF, 2025). This calculation does not differentiate between fat, muscle, or bone; because of this, results can sometimes be misleading.

Functional mobility: Functional mobility is an individual's physiological ability to move independently and safely in a variety of environments with the purpose of accomplishing functional tasks or activities with regards to daily living at home, work, and in the community(Bouca-Machado et al., 2018).

Pharmacotherapy: The use of medication to treat, manage, or prevent disease.

Intervention: In medicine, an intervention is a treatment, procedure, or other action taken to treat a disease or improve health in another way(National Cancer Institute, n.d.).

GLP-1 Receptor Agonist: Class of newer medications that are used to enhance satiety and regulate metabolism to help manage weight reduction and diabetes(Ng et al., 2025).

Healthcare Administrator: A healthcare administrator is a professional responsible for planning, organizing, directing, and evaluating healthcare services along with programs, staffing, and operating for a facility.

Table 1- Different BMI Ranges:

BMI Category	BMI Range
Underweight	Less than 18.5
Healthy	18.5 to less than 25
Overweight	25 to less than 30
Obese	30 or greater
Class 1 Obesity	30 to less than 35
Class 2 Obesity	35 to less than 40
Class 3 Obesity	40 or greater(Emmerich et al., 2024).

Capstone Research Question:

This research question guides the examination of current evidence for this project. In response to gaps in knowledge and practice, this capstone project seeks to answer the following question:

How effective are nutrition and exercise interventions in reducing BMI and improving functional mobility in American adults with chronic obesity?

Hypotheses:

The hypotheses for this study are used to test whether or not nutrition and exercise programs make a significant difference in BMI or functional mobility. These factors were chosen because they are closely related to both obesity and quality of life. The evidence found in the study will be used to determine which hypothesis is true.

Null Hypothesis:

Adults with chronic obesity who participate in structured nutrition and exercise programs do not demonstrate statistically significant reductions in BMI or measurable improvements in functional mobility.

Alternative Hypothesis:

Adults with chronic obesity who participate in structured nutrition and exercise programs do demonstrate statistically significant reductions in BMI and measurable improvements in functional mobility.

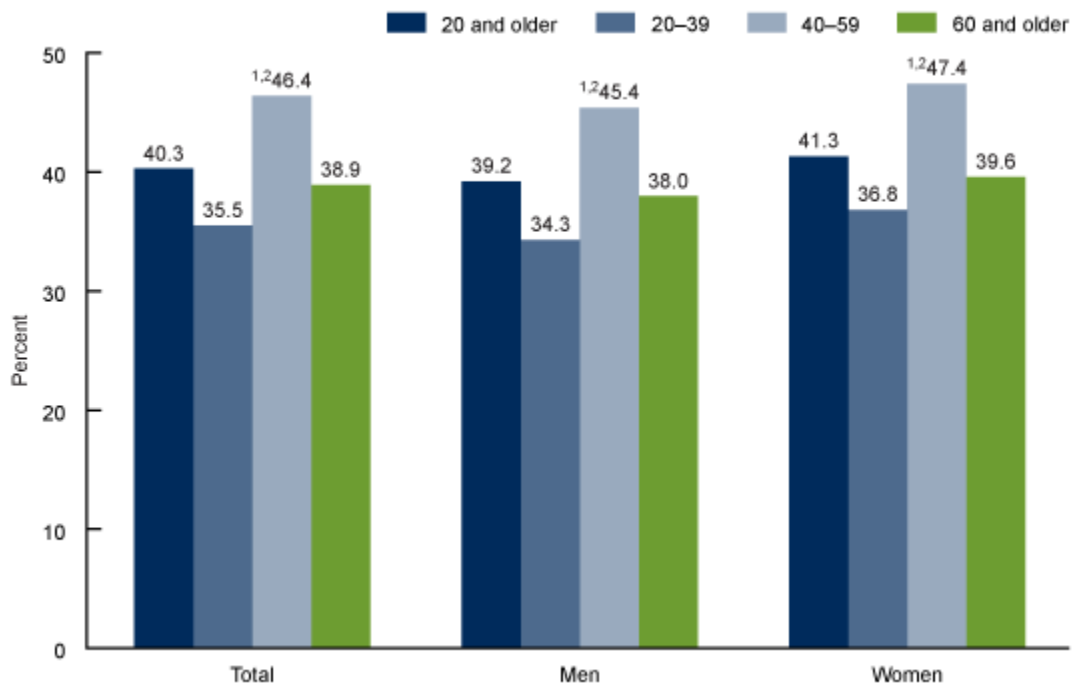
Literature Review:

Introduction

A growing body of research has examined the effectiveness of lifestyle-based obesity interventions, with particular attention to how nutrition, physical activity, and behavioral strategies influence weight reduction and functional mobility. The literature consistently suggests that obesity is shaped by not one, but many complex factors among biological, environmental, behavioral, and socioeconomic factors. Numerous reviews and randomized controlled trials highlight that exercise programs contribute not only to weight loss but also to improvements in muscle mass, physical functioning and long term mobility. Nutrition-focused research similarly emphasizes the critical role of dietary patterns in long-term weight management. In this review, there are several different dietary approaches that are explained further. This review looks to summarize current evidence from population data and studies to give greater context on how obesity affects quality of life, movement, and how certain lifestyle interventions may improve outcomes.

Prevalence and Impact of Obesity

Recent national and international data confirm that obesity continues to rise. The Centers for Disease Control and Prevention reported that between 2021 and 2023, an estimated 40.3% of U.S. adults met criteria for obesity, with 9.4% classified as severely obese. Women tend to have higher rates of obesity compared to men across all adult age groups as seen in Figure 1(Emmerich et al., 2024).

Figure 1

Obesity prevalence in Adults by age and sex: United States, August 2021-August 2023(Emmerich et al., 2024).

Long term trend analyses show that U.S. obesity rates have increased steadily and significantly since the mid-20th century(USAF, 2025). Forecasting studies project the growth in obesity prevalence to continue without population-level intervention(Janssen et al., 2020). Explanations for these trends are complex, but tend to include shifts in food systems, socioeconomic conditions, and environments that are conducive to high calorie diets and sedentary behavior(Swinburn, 2019; Drewnowski et al., 2020). The clinical and functional impacts of obesity are substantial. Obesity is a major contributor to type 2 diabetes, cardiovascular disease, osteoarthritis, and reduced physical functioning; it also increases the risk of premature mortality(Hruby and Hu, 2015). Obesity's burden goes beyond individual

morbidity; The condition severely drives healthcare utilization and costs(Woolf & Aron, 2013). These statistics give a good idea of how prevalent obesity has become and the basic impacts it has.

How Obesity Affects Functional Mobility

Obesity's consequences extend beyond metabolic health. Forhan and Gill (2013) discuss how excess adiposity alters biomechanics, joint load, and neuromotor control, leading to reduced balance, slower gait, and increased risk of mobility disability. Their review highlights how added body mass shifts the center of gravity, changes gait patterns, and increases stress on the knees and hips; mechanical factors that often cause pain and limit activity. These mobility restrictions contribute to diminished independence and poorer quality of life. Environmental factors such as inaccessible facilities and social stigma further compound these physical limitations (Forhan & Gill, 2013).

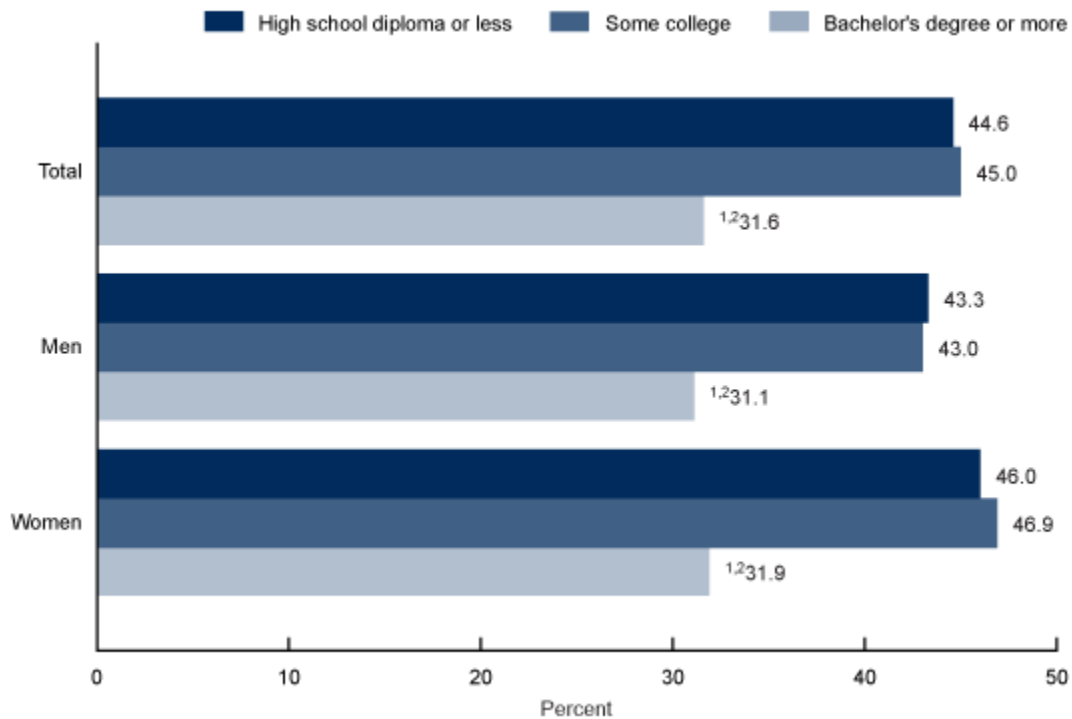
Contributing Factors of Chronic Obesity

Obesity is a multifactorial and chronic condition influenced by various interactions among biological, behavioral, environmental, and social factors. In most simple terms, obesity is caused when there is an imbalance in energy intake and energy expenditure(World Health Organization, 2025). While excessive caloric intake and physical inactivity remain primary contributors, genetics, metabolism, psychological factors, and social determinants of health play equally significant roles (Hruby & Hu, 2015). Studies estimate that up to 70% of the variability in body weight can be attributed to genetic factors influencing metabolism, fat storage, and appetite regulation. For example, adopted children would have higher correlations in BMI to their biological parents than they would to their foster parents (Speakman et al., 2018). Beyond biology, the modern food environment promotes high-calorie, low-nutrient dietary patterns

through widespread availability of processed foods and aggressive marketing, particularly in low-income communities(Swinburn, 2019).

Behavioral and psychosocial influences also contribute substantially. Chronic stress, poor sleep, and emotional eating patterns often perpetuate weight gain, while socioeconomic factors—such as education level, income, and neighborhood food access—shape individuals’ ability to maintain healthy lifestyles(Drewnowski et al., 2020). As seen in Figure 2 below, the obesity prevalence of individuals who received a bachelor's degree or more is significantly less than those who did not complete that level of education.

Figure 2



Obesity prevalence in Adults age 20 and older, by sex and education level: United States, August 2021-August 2023(Emmerich et al., 2024).

Additionally, environmental barriers, including urban sprawl and limited walkability, contribute to sedentary lifestyles and reduce opportunities for daily physical activity (Cacciatore et al., 2025). These factors create a cycle of caloric excess and energy imbalance that becomes difficult to reverse without serious effort or lifestyle intervention. Understanding these underlying determinants is essential for designing population-level nutrition and exercise programs that are realistic, equitable, and sustainable.

Evidence-Based Nutrition Interventions

Nutritional modification remains the cornerstone of obesity management and prevention. The literature consistently demonstrates that structured dietary interventions-particularly those emphasizing caloric restriction and improved diet quality-are effective in promoting weight loss and improving metabolic outcomes in adults with obesity (Most & Redman., 2020). One study investigated a calorie matched diet with ultra-processed and unprocessed foods. The adults who consumed an ultra-processed diet had higher weight gain compared to those who consumed an unprocessed diet, even though they were matched for macronutrients like calories, sugar, fat, protein, and fiber(Hall et al., 2019). Diets such as the Mediterranean which focus on high fat foods such as olive oil or nuts without restricting calories have shown minimal changes in BMI and waist circumference, suggesting high fat diets do not lead to significant weight gain (Estruch et al., 2019). This research suggests that food quality may play a larger role than most would believe.

A calorie deficit of 500-750 calories per day is commonly recommended to achieve gradual, sustainable weight loss. A “low calorie” diet means an individual is consuming around 1,000 to 1,500 calories per day, whereas a “very-low calorie” diet would be consuming less than

800 calories per day. The lowest calorie diet is typically not recommended because of unhealthy metabolic adaptations that take place (Kim, 2021). However, adherence to a plan is often a greater predictor of success than diet type alone. One particular study involved overweight and obese patients at a large health system utilizing a mobile application to self-monitor dietary intake for 8 weeks. The results showed strong promise with positive reports. Results like this indicate that the use of self-monitoring mobile apps might play a role in the future, considering 97 percent of Americans own a mobile phone and 85 percent own a smartphone (Payne et al., 2021). Overall from the literature regarding nutrition, replacing high-calorie, nutrient-poor foods with lower calorie, highly nutritious options supports satiety and helps regulate appetite hormones, leading to improved long-term outcomes.

Exercise and Physical Activity Interventions

Physical activity plays an equally large role in managing chronic obesity and improving functional mobility. Regular exercise enhances energy expenditure and fat loss but most importantly preserves lean body mass during weight loss. All forms of exercise are good, but high-intensity interval training has become a promising exercise method for adults with obesity (Bellicha et al., 2021). The U.S. Department of Health and Human Services recommends at least 150 to 300 minutes per week of moderate-intensity aerobic activity for not just weight loss, but general health, muscle strengthening, bone strengthening, improving sleep, and mental health. In 2017, only around 25 percent of American adults met the physical activity guidelines (Watson, 2019). While any form of physical activity is good, combining aerobic training with resistance training yields the best results for both weight management and functional mobility by improving strength, balance, and metabolic efficiency. Aerobic training is sustained activity such as walking, running, swimming, or biking. Both aerobic and resistance

exercise have shown improvements in muscle mass. This muscle hypertrophy, or growth of a muscle, increases the human metabolic rate- a good thing for obese individuals (Tan et al., 2023).

Even modest weight loss of 5-10% of initial body weight is associated with a considerably lower risk of chronic conditions. Exercise may also play a role in the relationship between body weight and cognitive decline(Hruby & Hu, 2015). One study suggests that exercise is a first line therapy for individuals with obesity(Eglseer et al., 2023). Fruh et al.(2021) suggests that physical activity is one of the most simple, effective healthy home habits that one can have. With physical activity, health benefits can be observed even after a single session. For adults with chronic obesity, physical activity helps mitigate sarcopenic obesity by maintaining muscle mass despite fat loss(Reiter et al., 2023).

Emerging Interventions for Chronic Obesity Management

While structured nutrition and exercise interventions remain foundational in managing chronic obesity, recent advances in pharmacotherapy are rapidly emerging and altering the treatment landscape. Among these, the class of glucagon-like peptide-1 receptor agonists (GLP-1 RAs) and related incretin-based therapies have demonstrated meaningful reductions in BMI and body weight. These medications are now recognized as powerful complements to other lifestyle-based interventions(Collins & Costello, 2024).

A comprehensive meta-analysis by Wong et al. (2025) synthesized results from 47 randomized controlled trials involving 23,244 patients and reported that GLP-1 RAs significantly reduced weight, BMI and waist circumference compared to the placebo group. Results were averaged with a BMI reduction of 2.07 kg/m², weight reduction of 4.57 kg, and waist circumference reduction of 4.55 cm all compared to the placebo group. The group who

benefitted from the treatment the best tended to be younger, female patients who did not have diabetes(Wong et al., 2025). Similarly, Iqbal et al. (2022) found a mean weight loss of 7.1 kg across 12 different trials of adults who were overweight or obese. These findings show the weight loss effects of GLP-1 RAs.

More recent real-world data extends these findings into clinical practice, Ng et al. (2025) observed mean weight reductions of approximately 14 to 16% with differing doses after one year of treatment(Ng et al., 2025). A systematic review and meta-analysis conducted by Berg et al. (2025) found that discontinuation of GLP-1 RA therapy was associated with an average weight gain of around 9.7 kg, which is comparable to the average weight that is lost one year from starting the medication(Berg et al., 2025). This information suggests that GLP-1 RA interventions should be considered a chronic form of therapy to prevent weight gain again.

Research suggests these medications should not be viewed as replacements for nutrition and exercise programs, but rather supplemental support. For instance, a study found that when a supervised exercise component was added to a GLP-1 RA regimen, the participants maintained weight and fat-mass improvements one year after treatment termination, compared with GLP-1 therapy alone(Jensen et al., 2024). This finding underscores the benefits of combining lifestyle interventions with pharmacotherapy and signals the importance of behavioral and educational support in sustaining outcomes.

Obesity in the United States Compared with Other Countries

Despite being one of the wealthiest nations in the world, the obesity rates in the United States remain substantially higher than both global averages and those of other high-income nations. National surveillance data from the Centers for Disease Control and Prevention (Emmerich et al., 2024) estimate that approximately 40.3% of American adults meet clinical

criteria for obesity, with every U.S. state reporting prevalence rates above 20%. This places the United States among the highest in the world for adult obesity prevalence.

By comparison, the World Health Organization suggests the average adult obesity rate worldwide is around 16%. Of all the cases of obesity, the region of the Americas make up a commanding 67% of those cases with Asia making up only 31% of the total population(World Health Organization, 2025). After comparing those rates, the U.S. obesity rate is more than double the global average and significantly higher than most similar nations. Similarly, Vasunilashorn et al. (2013) reported that Americans are more than three times as likely to be obese and more than 13 times as likely to be very obese than those in Taiwan.

There are several reasons for this disparity. Cultural globalization and the “Westernization” of society encourages the consumption of fast foods rather than cooking food independently. These modern trends are characterized by high-calorie, processed foods and sedentary routines have accelerated obesity worldwide, but are most pronounced in the United States. The urban American environment promotes this type of food and sedentary lifestyle with transportation systems(Cacciatore et al., 2025). Socioeconomic status across populations also magnifies differences in education and ethnic disparities. The type of methodological data collection could also contribute to a small amount of cross-country contrasts with U.S. surveys such as the National Health and Nutrition Examination Survey use measured information such as height and weight where international datasets could depend on self-reported information, which could underestimate obesity prevalence(Vasunilashorn et al., 2013).

Scanning literature on this topic shows that it is not just obesity that the U.S. has higher rates of, but adverse birth outcomes, injuries, homicides, sexually transmitted infections, drug-related mortality, diabetes, heart disease, lung disease, and disability. One explanation for the

U.S. health disparities is the healthcare system itself. The Institute of Medicine and National Research Council have issued many reports claiming weaknesses that include fragmentation, misalignment of goals, limited access, and quick adoption of new costly technologies (Woolf & Aron, 2013). All of these factors together largely contribute to rising healthcare costs and productivity losses.

Summary of Literature

The existing body of evidence supports the effectiveness of comprehensive lifestyle interventions-particularly those integrating nutrition, exercise, and behavioral modification-in improving health outcomes among adults with chronic obesity. Studies consistently demonstrate that sustained caloric restriction, increased physical activity, and structured behavioral support produce clinically meaningful reductions in BMI, enhance health, and improve overall quality of life. The emerging research on pharmacological interventions including GLP1-RAs suggest these therapies can be used as effective adjuncts to lifestyle interventions. However, long-term data on their integration into health systems, cost-effectiveness, and sustained impact is limited. There are numerous studies examining short-term weight loss outcomes, but fewer investigating the maintenance of those results beyond one year or on their broader effects on physical function, mobility, or healthcare utilization.

From an administration perspective, there is limited empirical evidence linking specific organizational strategies to measurable outcomes in obesity management. A vast majority of the literature focuses on clinical efficacy rather than implementation feasibility or sustainability within healthcare systems long term. There is not a wide view of literature on functional mobility with regards to obesity research, as most studies focus solely on BMI or body weight as primary targets.

Research Methodology

This study used a systematic literature review design. The research was conducted with the purpose of answering the research question and gaining surrounding information around the topic. The research question searches for the effects of nutrition and exercise interventions on BMI and functional mobility. This topic is investigated by searching through and analyzing literature that is publicly available and has been published within the last 10 years. The UAFS library database, Wiley Online Library, PubMed, and Google Scholar were all utilized to find credible resources. The actual analysis consisted of finding specific studies that showed results from differing exercise and nutrition interventions on obese patients. The rates of obesity used are found within the United States and other countries are used for comparison. Different age ranges were used to distinguish differences by age, but the primary age range is adults over the age of 18 and younger than the age of 65.

Limitations

Although this project provides insight into the complex disease of obesity and the effectiveness of certain interventions, there are several limitations that should be acknowledged. As a literature-based study, findings are dependent on the quality and availability of existing research rather than primary data collection. The analysis is limited by the quality, design, and variability of the studies included. Many of these studies differ in their sample size, duration, intervention components, and measurement tools, making it difficult to draw uniform conclusions or compare results directly. Many studies reported short-term outcomes, but long-term follow up data was limited.

In reviewing these studies, lifestyle interventions often vary in their intensity, frequency, and method of delivery. These inconsistencies reduce the ability to determine which specific

components made the largest difference. Other potential limitations include possible publication bias by favoring studies with positive outcomes. Additionally, few studies directly address healthcare administrative strategies or functional mobility as a primary endpoint, which restricts generalizability of conclusions for organizational policy implementation. Recognizing these limitations helps frame and contextualize the findings. It is also important to consider that of the available data, it is not fully current and up to date, so some of the provided information could be slightly outdated.

Ethical Issues

For this specific study, there were not any individual subjects or personal information to be used due to the information being public, anonymous, and previously published. As a result of this methodology, no institutional review board approval was required. There are no direct mentions of names or identifiable individuals listed in any of the participants in the studies chosen. All sources were cited according to APA 7th edition standards. Even though no direct human participation was required for this study, care was taken to ensure that there were no conflicting ethical issues or considerations involved.

Results and Findings:

Overview

This study searched peer-reviewed studies, including randomized controlled trials, meta-analyses, and systematic reviews published between 2013 and 2025, to assess the effects of nutrition and exercise primarily, but also behavioral and pharmacologic interventions on obesity-related outcomes. Collectively, these studies demonstrated strong evidence supporting structured lifestyle interventions-particularly those combining dietary modification and physical activity-as the most effective non-surgical strategies for reducing body mass index and improving functional mobility in adults with chronic obesity.

Nutrition-Focused Interventions

Across the reviewed literature, nutrition-based programs consistently produced significant reductions in BMI and body weight. One study examining the physiological effects of calorie restriction reported consistent evidence of metabolic adaptation, defined as a reduction in energy expenditure greater than what would be expected based on loss of fat and lean mass alone. When calories were restricted around 20%, energy expenditure decreased by about 10%. From this specific review, calorie reduction directly induces weight loss, even though the energy expenditure is disproportionate and not fully understood yet. If caloric restriction is implemented in early adulthood, lifespan could be increased by up to 5 years based on previous studies(Most & Redman, 2020). The review identified several mechanisms contributing to this adaptation, including decreases in insulin secretion, thyroid hormone activity, and leptin concentrations, as well as increases in mitochondrial energy efficiency.

Another study utilized an eight-week, single-arm uncontrolled prospective study of mobile dietary self-monitoring. This intervention was used among American adults with obesity. On average, individuals lost about 3.3 pounds over the course of the 8-week program. Participants who logged their food more consistently tended to lose more weight (Payne et al., 2021). As the weeks went on from one to eight, the average days monitored decreased (see Appendix B). This study helps show that those who track and stick to dietary plans can meet their goals.

A randomized controlled eating trial run by Hall et al. (2019) provided information regarding how diet quality, specifically the level of food processing, affects energy intake and weight. Hall et al. utilized 20 inpatient adults who would be exposed to ultra processed versus unprocessed diets for 14 days each, randomly. Although both diets were designed to contain a similar amount of calories and nutrients when served, participants were allowed to eat as much as they wished. The researchers found that people automatically consumed about 500 more calories per day when eating ultra-processed foods, mostly from carbohydrates and fats. As a result, participants gained nearly 1 kilogram during the ultra-processed diet and lost a similar amount during the unprocessed diet, even though they were not instructed to diet or restrict intake (see appendix A). These findings show that ultra-processed foods can drive unintentional overeating, contributing to weight gain even when nutrient content appears equivalent.

Exercise and Physical Activity Interventions

Across the reviewed literature, exercise-based interventions consistently demonstrated meaningful improvements in body composition, functional mobility, and weight-related outcomes for adults with chronic obesity. Although the magnitude of weight loss varied across

studies, the evidence strongly supports exercise as a core component of effective obesity management.

Large-scale systematic reviews, including an overview of 149 studies from 2010 to 2019, found that regular structured exercise reliably produced reductions in body weight and fat mass while preserving or increasing lean mass. Aerobic exercise, resistance training, and combined modalities all contributed to meaningful improvements, with combined aerobic-resistance programs yielding the largest body composition benefits. During diet-induced weight loss, the method of resistance training was the best at preserving muscle-mass which promotes functional mobility (Bellicha et al., 2021).

An umbrella review consisting of four studies with between 30 to 225 participants revealed that exercise interventions improved muscle mass and strength while reducing fat mass. Lower leg strength increased by 9.97 kilograms on average. Not only was strength and muscle mass improved, but gait speed increased from 0.14 meters per second to 0.17 meters per second (Reiter et al., 2023). These results give a strong positive correlation for exercise interventions improving functional mobility and BMI.

Discussion

The findings of this project support the evidence that nutrition and exercise interventions play a crucial role in reducing BMI and improving functional mobility among adults with chronic disease. Across the literature, programs that combine methods such as dietary modification, aerobic exercise, and resistance training consistently show greater improvements rather than single-component interventions. These results reinforce the need for healthcare organizations to adopt comprehensive strategies rather than relying on isolated treatment or short term counseling. Although pharmacologic treatments such as GLP-1 RAs have definitely shown

promising weight-reduction outcomes, the evidence suggests that they should be integrated in combination with lifestyle interventions that promote behavior change, preserve lean muscle mass, and prevent functional decline.

There are also several recommendations for healthcare administrators, clinicians, and organizations. Healthcare organizations should prioritize the development of structured lifestyle programs that include individualized nutrition counseling and supervised exercise sessions. Administrators could consider partnering with dietitians, physical trainers, and behavioral health specialists to ensure that interventions address the physical, nutritional, and psychological aspects of obesity management.

Secondly, healthcare providers should emphasize continuity of care and long-term engagement. Many adults participating in weight-loss programs struggle with adherence to a plan or sustaining the proper behavior, particularly after structured support ends. To address this, organizations could build follow-up mechanisms that keep accountability high. Options such as group classes, digital coaching, or accountability groups to keep support levels high. When individuals feel supported, they are much more likely to stick to a plan.

There are also barriers that limit patient access to lifestyle interventions. Socioeconomic factors including cost, transportation, time constraints, and health literacy- may reduce program participation. Generally speaking, it costs more to eat healthier, more nutritious foods, to go to a gym, or to pay someone to provide helpful instruction to achieve results. Insurance coverage could be expanded to accommodate nutritional therapy, exercise therapy, or behavioral counseling.

While individuals cannot always control their current situation regarding demographic or socioeconomic status, they can often have greater control over their actions and their attitude.

Positive attitudes, self-efficacy, and social support have all been shown to have positive results on healthy habits such as diet and physical activity(Drewnowski et al., 2020). If some of those struggling with obesity would adopt a more positive mindset rather than negative, improving their scenario would be easier as well.

Even though most of the data from this study is current, it will be changing to some degree in the future, whether positive or negative. It is important to recognize that these are issues many people live with daily but do not want to. They might have made a choice to put themselves in a not great situation, but they should have an opportunity to get themselves out. For that reason, healthcare professionals have the responsibility to help out others whenever possible.

Future Research

Future research carries an important role, as global cost projections climb to 18 trillion dollars by the year 2060(World Health Organization, 2025). Future studies examining obesity and possible solutions should expand beyond short-term weight loss outcomes to get a clearer picture of overall health rather than a number on a scale. This will likely go beyond exercise and nutrition alone, but other possible factors. Further investigation is also needed to explore how structured nutrition and exercise programs interact with emerging obesity treatments, like GLP-1 receptor agonists and other pharmacotherapies. In addition, research exploring barriers to participation could provide insight into systems or behavioral factors that influence engagement and sustainability of healthy lifestyle practices. With positive results being drawn from mobile apps used to aid with self-monitoring weight loss techniques, it can be assumed that this will also be researched more in the future(Payne et al., 2021). The specific biological events that surround increased activity and calorie restriction can be expected to be explored further in the future.

While it is not possible to fully predict what the future research will look like, it will most likely be a combination of what is currently known and new findings as time progresses. More time for data collection will also help with developing future treatments and recommendations.

Conclusion

This study examined the relationships close in proximity to obesity, particularly nutrition and exercise. The issue of obesity is not one that applies to an organization or a specific demographic, but rather one that applies nationwide. The cause of obesity cannot be attributed to one factor, but several. With today's modern lifestyle, popular unhealthy behaviors stack up over time to make many individuals overweight and less mobile. The literature had favorable news and unfavorable news. Obesity is a difficult problem to fix, but it can be fixed. The findings of this study support the alternative hypothesis that comprehensive nutrition and exercise interventions can significantly reduce BMI and improve functional mobility among adults with chronic obesity. These outcomes support and reinforce interventions that address both diet and physical activity, rather than focusing solely on one in isolation. These two factors, when combined, can produce powerful results. Not only do the interventions themselves make a difference, but supplemental support and positivity can also have a large impact on reaching desired results. This study is purposed to show how obese individuals can improve their life quality and therefore lightening the obesity burden on healthcare systems.

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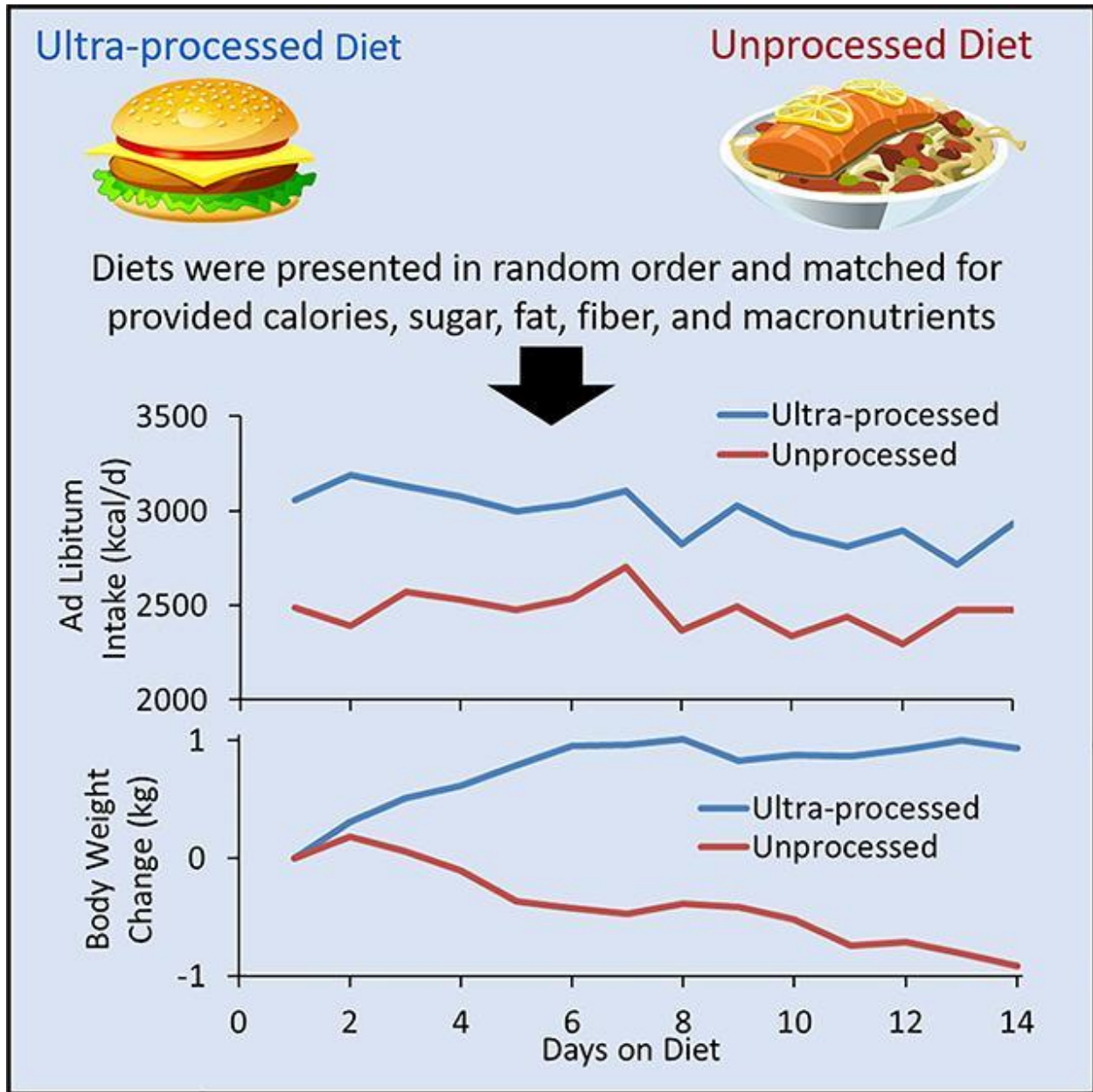
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Appendices

Appendix A

Ultra-processed versus Unprocessed Diet(Hall et al., 2024).



Appendix B

Self-monitoring app usage over 8-weeks(Payne et al., 2019).

