

Pathopharmacological Foundations for Advanced Nurse Practice

Name:

Institutional Affiliation

Pathopharmacological Foundations for Advanced Nurse Practice

Prevalence of Obesity

According to recent findings from Centers for Disease Control and Prevention (CDC), nearly four in every ten people in the U.S have a BMI of above 30 and are regarded as obese (Seidell & Halberstadt, 2015). The rates of obesity among adults have continued to increase steadily, rising from 32.5% in 2010-2011 to 39.4% in 2015-2016. The prevalence of obesity among youths currently stands at 18.5% (Seidell & Halberstadt, 2015). One in five adolescents aged 12-19, one in five children aged 6-11, and one in ten preschoolers aged 2-5 is considered obese. This trend is worrying, and more young individuals are likely to stay obese due to their lifestyles. Childhood obesity is associated with high chances of adult death — obesity linked to serious health complications such as type 2 diabetes, stroke, heart disease, and certain types of cancers. These complications are the primary cause of premature and preventable death. The World Health Organization (WHO) projects that the health cost of obesity in the U.S in 2015 was \$ 147 US billion dollars (Seidell & Halberstadt, 2015). The report also demonstrates that the medical cost for an obese individual was \$1345 higher than those of normal weight. The purpose of this paper is to analyze the pathophysiology of obesity, discuss evidence-based pharmacological treatments, characteristics of an obese individual, factors leading to obesity, impacts of obesity, best practices of managing obesity and strategies which an individual can use to manage obesity.

Pathophysiology

The adipocyte is the cellular basis for obesity is which may increase in number or size in obese patients. Hypertrophic obesity is a type of android abdominal obesity which is

characterized by inflated fat cells. It usually begins in adulthood and is linked to increased cardiovascular risk. Hypertrophic obesity responds quickly to weight loss measures (Ogden et al. 2014).

Hypercellular obesity is more variable than hypertrophic obesity. It usually develops in people who develop obesity during their childhood and teenage periods. It is invariably found in persons with adverse obesity. Obesity occurs as a result of an imbalance of calories consumed and the burned calories. The adipocytes are increasingly multifaceted and metabolically active cells. The adipocyte is believed to be an active endocrine gland secreting several metabolites and metabolites which are relevant to control of body weight. Some adipocytokines secreted by adipose play an important role in coagulation of blood. Other adipocytokines are involved in the regulation of appetite and insulin sensitivity (Ogden et al. 2014).

Changes in physical activity and diet are associated with a decrease in physical activity and increase intake of high-density foods. If an individual consumes few calories that they metabolize they will lose weight. Conversely, if an individual eats more calories than they can metabolize, they will gain weight. The primary causes of obesity are physical inactivity and overeating. Other causes may include culture, environment, and genetics (Ogden et al. 2014).

Culture plays an important role in increasing the likelihood of developing obesity. For instance, the prevalence of obesity among Hispanics and non-Hispanic black children is above the average. Both Hispanic and non-Hispanic youths are likely to have been born from humble backgrounds which is a major risk factor for obesity. This increase in obesity is associated with lack of access to healthy foods, failure to educate patients on proper nutrition, poor neighborhoods, and limited physical activities in schools in the community (Ogden et al. 2014).

The environment plays a critical role in the development of obesity. For instance, lack of physical activity due to the residence of an individual can lead to obesity. Children spend many hours in front of television or playing outdoors. Shopping online has reduced walking to the local mall and escalators have replaced stairs. The environment in which an individual lives has a great impact on their health (Ogden et al. 2014).

Genetics are also associated with obesity. An individual is likely to become obese if they have a sibling or a parent who is obese. Fats in the body are regulated by a hormone known as leptin. This hormone signals the brain to eat less when there is high storage of fats. A deficiency in the secretion of leptin results in obesity (Ogden et al. 2014).

In addition to neurogenic and neurotransmitters, many hormones affect food intake and appetite. For instance, melanocortin hormone modifies appetite through its effects on various melanocortin hormone. Endocannabinoids stimulate lipogenesis, enhance absorption of nutrient, and increase appetite through their effect on endocannabinoid receptors (Ogden et al. 2014).

Standard Practice for Obesity

The National Heart, Lung and Blood Institute developed clinical guidelines based on evidence-based practice to address the causes, treatments, and complications associated with obesity (NHLBI, 2017). This clinical guideline provided healthcare practitioners with strategies for implementing effective weight loss. These guidelines are endorsed nationally and serve as the framework for physicians in making treatments and evaluations for obese patients. The guidelines emphasize that treatment of obesity is a two-two process including management and assessment. The process of assessment begins with healthcare practitioners measuring weight and height and calculating the body mass index (BMI) at every patient visit. Identification of

overweight and obese patients will involve counseling a BMI of more than 30 will increase the risk of diabetes type 2, cardiovascular vascular, and increase mortality rate. For obese and overweight individuals to begin losing weight, it is to incorporate lifestyle changes and interventions. The physician will recommend an increase in physical activity, and prescribe a particular diet to attain reduced calorific intake. This intervention aims to maintain healthy body weight and reduce body weight (NHLBI, 2017).

In Florida, care physicians use the guidelines provided by the NHLBI. According to recent health statistics by the CDC, Florida has the 14th lowest adult rate in the United States. The state has embraced various steps to reduce and the prevalence of obesity (Seidell & Halberstadt, 2015). For instance, the state has regulations for schools to provide mandatory physical activity along with mandatory lunch and breakfast choices. Florida also has funding for healthy food financing such as the Supplemental Nutrition Assistance Program (SNAP). Healthcare providers within Florida have a role of educating patients about weight loss and risk factors which cause obesity. Besides, care physicians will also follow the national guidelines to measure the patient's weight circumference and the BMI (NHLBI, 2017).

At my local hospital, health practitioners adhere to the guidelines outlined by NHLBI. Florida Hospital's bariatric specialist, Dr. Kim, will begin with measuring a patient's waist circumference and BMI. Dr. Kim and his team of professionals will discuss the correct weight management program. The practice standards are maintained at the same level at the local, state national level.

Pharmacological Treatment

Lifestyle interventions such as physical activity and changes in diet are the primary methods of treatment for obese and overweight individuals. However, lifestyle changes may not be effective to provide lasting weight loss. When changes in diet and physical activity are not effective to provide lasting weight loss, pharmacological interventions are considered. The Federal Drug Administration (FDA) has approved weight loss drugs for long-term use (Ogden et al. 2014). Some of these drugs include orlistat and sibutramine. When an obese or overweight person does not lose weight after six months of lifestyle change, the FDA recommends pharmacotherapy which can be helpful as an adjunct for some patients. Weight loss drugs used to manage obesity are appetite anti-depressants and anorexiant which work through increasing production of neurotransmitters. For instance, Sibutramine inhibits reuptake of neurotransmitters while producing a stimulating metabolic rate and anorectic effect. The side effects associated with Sibutramine include insomnia, dry mouth, constipation, and headache. Patients administered with Sibutramine may also experience an increase in blood pressure and heart rate (Ogden et al. 2014).

Orlistat works by blocking absorption of fats through acting in the gastrointestinal tract. This drug is not absorbed and blocks lipases which decrease hydrolysis thus permitting excess fats to be eliminated in the feces. Orlistat may cause adverse effects on the patient based on the number of excess fats an individual consumes. The patient may experience oily spotting, fecal incontinence, and flats. Sibutramine and Orlistat have proven to cause weight loss effectively. However, these drugs should only be used under complete program monitored by a physician. Other drugs used for short-term loss of weight include Ephedrine. However, its use is limited due to complications such as increased heart rate and high blood pressure, and such medications can cause cardiac complications (Ogden et al. 2014).

In Florida, the standard for prescribing obesity medication by the state's Health Department has a purpose of improving weight loss and is only carried out by a qualified through obesity training. In Florida, physicians are not allowed to prescribe a drug which does not have approval from FDA. In my local hospital, obese patients meet with a multidisciplinary team of psychologists, pharmacist, dieticians, and doctors to get a knowhow of methods of enhancing weight loss and the patient's lifestyle.

Clinical Guidelines

Assessment- Assessment of patient who is underweight loss therapy involves a measurement of the patient's weight circumference, body mass index, and overall morbidity and risk factors associated with the disease. The initial assessment of a patient should include the patient's overall motivation to lose weight to help promote the overall success of assessing obesity.

Diagnosis: Obesity is commonly diagnosed by calculating the BMI of an individual. For instance, adults whose BMI range from 30.0 to 39.9 are considered obese while those with a BMI of 40.0 and above are regarded as extremely obese.

Patient Education- Healthcare providers can help to educate patients on strategies to improve physical activity, to improve nutrition and team them on the approaches to sustain a healthy lifestyle. The patient is instructed on physical activity and diabetes plan based on their BMI and lifestyle. The NHLBI provides health practitioners with a tool to effectively manage obese patients (NHLBI, 2017). Clinical guidelines have also been designed to help identify, evaluate, and treat overweight and obesity adult based on a systematic review of evidence-based practice.

Prospective studies have shown that over 80% of individuals who lose weight will slowly regain. Therefore, patient education is critical in initiating and maintaining weight loss.

Standard Practice of Obesity Management

In my community hospital, the standard of practice originates with a specialized trained care coordinator. The care coordinator is assigned to a patient and monitors the weight loss journey from the start to the end. Treatment of obesity depends on three tracks which are based on the patient. The first track is the evaluation stage. During the evaluation stage, the patients meet the multidisciplinary healthcare team to discuss their diet, modern lifestyles, and weight loss strategies. It involves the evaluation and assessment of obesity specialist. The physician, in this case, measures the patient's waist circumference, BMI, and discusses the risk factors for obesity with the patient. The NHLBI provides clinical guidelines to be followed by healthcare providers. The patient is also informed about tools to identify causes that lead to obesity and lifestyle choices.

The second track is known as the medicine track. Drugs used for managing obesity are used along with a management plan which is prescribed and examined by a doctor. There are different drugs used in the treatment of obesity such as Orlistat and Sibutramine.

The third track is known as surgical track which is recommended for severely obese patients whose BMI is above 40.0. When the two previous tracks prove to be ineffective, and the patient is identified as a health risk, they are assessed for bariatric surgery.

Comparing the clinical guidelines of my community hospital with that of NHLBI the standard for obesity management is both tailored to the demands of patients to make weight loss more successful.

Managed Disease Process

According to NHLBI, treatment of obesity should involve a two-step program which includes assessment and management of the condition (NHLBI, 2017). Weight loss and obesity management are a big struggle for many obese patients. Patients who lose weight are likely to regain it within five years. Maintaining a healthy lifestyle is a long-term commitment and an individual needs to be assisted through counseling, be motivated and comply with the dietary and physical challenges that promoted the initial weight loss. During this weight maintenance phase, drug therapy may be considered to help maintain a healthy weight. The health provider and the patient are required to remain in contact for about six months which has proven result to a more effective weight loss as well as weight maintenance goal. There are various factors which help a patient to manage obesity including drug therapy, support, and lifestyle changes.

Outcomes

According to a report by the CDC, obese patients who comply with NHBLI guidelines and loses of weight reduce chances of premature mortality by 18% (NHLBI, 2017). A study of obese adults demonstrated that by reducing weight by 5% will lead to a decreased risk of diabetes and cardiovascular diseases as well as lowering the cholesterol level (Liu et al. 2018). Weight loss leads to improved blood glucose and blood pressure. Obese patients need to engage in physical exercise and maintain a healthy diet. A well-managed patient can live a normal and long life.

Treatment Options- Upholding healthy support, exercise routine, and a healthy diet will allow an obese patient to live a quality life. When the patients have set up an effective and routine weight loss plan, the physician can change them to a conservation program. If weight

gain is noted after this program, the patient may need to resume a short-term weight loss. This is critical to the effective weight loss of the patient. Keeping the managed patient on track is important.

Access to Care: Accessibility of care facilities impacts management of obesity. Patients with suitable access to care are more likely to maintain weight loss than their counterparts. Patients need to make it a precedence to liaise with their care providers for calculations of waist circumference and BMI. Patients who keep regular appointment have a higher chance of sustaining the weight loss. The health provider will act as a support to help encourage patient success and provide tools for weight loss.

Life expectancy: Obese patients are at a greater risk of developing other complications such as stroke, heart disease, and cancer. These complications are associated with premature deaths. A study on obesity by the National Institute for Health found that obesity can decrease life expectancy by 14 years (Alston & Okrent, 2017). A patient who reduces weight can decrease the risk of developing cardiovascular diseases, cancer, and type 2 diabetes and hence raise their life expectancy by more than a decade.

Disparities

The prevalence of obesity is rising in the United States. Equally alarming of this condition is the increased disparities in obesity. The rates of change for ethnic/racial minorities are significantly greater than those of whites making it essential for health care providers to understand differently better changing physical environments and dietary that are the root cause of obesity. In the United States, obesity has been on the rise in the past two decades and has reached epidemic proportions. The CDC projects that by 2030 about 50% of Americans will be

obese (Alston & Okrent, 2017). Obesity is greatly influenced by the social environment.

Prospective have shown that socioeconomic status, geographical location, sex, and race are tied to the disparities in the incidence of obesity. Among the US population, the Latino and Black population have higher rates of obesity than their White counterparts. The rate of obesity among black females in America is higher than any other group in the country. Statistics show that for every \$2 earned by white families, the African American families earn \$1 and over 82% of the black women are obese or overweight (Alston & Okrent, 2017). This disparity is associated with limited access to safe places to be physically active and affordability of healthy foods. There is a linear correlation between lower income with a high prevalence of obesity because less nutritious food is less expensive. Households in a low-income neighborhood have limited access to fresh produce and recreational facilities.

Access to healthcare is another major disparity among obese patients. Weight loss programs require regular physician visits, blood work, counseling, and monitoring of weight loss. Patients from low-income families may not be able to facilitate their medical fee, and daily transportation to see the physicians as well as the time off work when they go for a clinical visit.

The obesity disparities in the United States and Europe are quite similar. Women are five times more likely to become obese than men. Low socioeconomic groups are twice as likely to be obese. Inequality is quite evident in areas inhabited with a high population of immigrants who reside in low socioeconomic regions because of their economic status. In these areas, healthy food is expensive, less accessible, and less convenient. Europeans living in low-income areas have limited access to safe spaces for physical activity, fresh vegetable, and fruits. However, they have a vast supply of fast food choices. National and international obesity levels are similar and are mainly based on income and gender. According to a report by the World Health

Organization (WHO) low socioeconomic background affects obesity and the prevalence of obesity is higher in men than in women (Alston & Okrent, 2017).

Managed Disease Factors

Various factors help patients to manage their weight loss effectively. These factors may include financial resources, access to care, and insurance coverage.

Financial Resource- Financially stable patients are usually successful in managing their weight loss. For instance, in Canada, patients are required to pay the cost of meal replacements. The state provides medically supervised meal programs whose costs range from \$1,000 to \$2,000 (Liu et al. 2018). Drugs are not covered by the public benefits plan. Thus being financially stable is important in the management of weight loss.

Access to care- Obese patients require close healthcare attention and will need to have access to obesity specialist or primary care physician. Having easy access to these providers helps patients to be compliant with follow-ups and clinical appointments. Patients who are in a position to meet their care providers without necessarily having to take off from work are likely to demonstrate successful weight loss. Efficient transportation will facilitate appointments as it will allow the convenience of making weigh-ins, support groups, and nutrition counseling.

Insurance Coverage- Obese patients with a BMI of 40.0 and above may need bariatric surgery. The cost of bariatric surgery is estimated to be about \$30,000 (Liu et al. 2018). Patients with insurance coverage can benefit from their premiums. Most healthcare plans provide cater to weight loss treatments, counseling, medications, and surgery. For instance, if a patient is insured for weight loss treatment, they are likely to have effective weight loss management. When a

patient is insured against all these treatments will help them to focus on the treatment not the cost of the program.

Unmanaged Disease Factors

The factors which facilitate management of weight loss can also compromise a patient in managing weight. These factors include financial resources, access to care and insurance coverage.

Financial Resources- Lack of financial resources makes the process of management of weight loss for obesity daunting. The cost for healthy food, transportation, and co-pay office visits is expensive. Patients are expected to make an appointment with the multidisciplinary team to make continue monitoring the progress of their weight loss. The additional cost may not be covered by insurance. Most health insurance premiums demand a large fee for specialized services. The patient may have to incur transportation cost to and from especially when the physician is not within the local residence of the patient. The patient may be forced to take time off from work to compensate for office hours. The insurance premiums do not cover meal plans, and this makes it difficult for patients to adhere to dietary restrictions.

Access to Care- Access to care may be limited even if a patient can offer their financial benefits for weight loss program as well as their transportation. For instance, in Canada, there are few programs with a multidisciplinary team with only 40 board certified obesity management physicians. Access to care is limited with more than one in four adults being obese.

Insurance Coverage- Patients who are not insured have to pay out-of-pocket for any obesity treatment. It is estimated that the average cost of bariatric surgery is about \$30,000 (Liu et al. 2018). This cost is exclusive of follow-up visits, counseling, and cost of dietary plans. A patient

with low income and no insurance coverage will not adhere to recommended weight loss programs and will be unable to manage obesity.

Unmanaged Disease Characteristics

When unmanaged, obesity can lead to health complications such as sleep apnea, stroke, blood pressure, cancer, osteoarthritis, cardiovascular diseases, and diabetes. Most of these complications can cause premature death if left untreated. According to the Centers for Disease Control and Prevention, obese persons have a higher risk of mortality and morbidity than people with normal weight.

Obesity impacts the quality of life of an individual. An obese patient is likely to experience breathlessness because of carrying excess fats which obstructs them from engaging in physical activities. Obese patients often experience pain in the joints and at the back and feels tired frequently. An unmanaged patient will have high cholesterol levels and increased blood pressure which increase the risk of developing cardiovascular disorders. These risks can result in a stroke or heart attack which cause significant disabilities. Obese patients will have a high likelihood of hospital readmissions for complications associated with obesity. These patients may psychologically be depressed and can isolate themselves from society. Patients with the unmanaged obese condition will have a shorter life expectancy than their counterparts who are compliant with physician's advice (Liu et al. 2018).

Patients, Families, and Populations

Obese patients are at a greater risk of developing adverse medical complications. Obesity also increases the rates of mortality and morbidity, and this poses a great concern for this epidemic. Obesity is associated with psychological distress, and in a world where slim is

attractive, obese individuals can suffer from low self-esteem. The stigma of being weak or lazy is usually the blame for obesity. Studies have shown that caregivers, nurses, and physicians can have the perception that obese patients are unpleasant, weak, and over-indulgent (Liu et al. 2018). There is a correlation between high rates of social isolation, anxiety, and depression. In my community, there are not support programs for obese patients. There is no local gym or support groups. Fast foods are easily accessible, and vendor even offers delivery options.

Patients with unmanaged obesity develop health complications which can be a burden to the family. Obese patients usually feel embarrassed and ashamed. They rarely participate in activities which need them to go out in public. Family members may feel burdened with the additional care required by the obese patient. They may also most of the spent time taking care of their loved ones which they would spend on movies or at the park.

In my community, the population of Hispanic is 40%, Whites 30%, African American 20%, and other races make up to 10%. Addressing the disparities in healthcare is crucial considering that Hispanics who are the majority of the population have a higher rate of obesity than the other the other groups (Liu et al. 2018).

Costs

The health cost of managing obesity is enormous. For instance, in the U.S, the healthcare cost of obesity of obesity and obesity-related complications is about \$190.2 billion per annum.

Cost for Patients

The cost for obese patients includes dietary plans, surgery, transportation, medications, and doctor office visits. It is estimated that obese patients spend about 42% more on direct care than healthy individuals. An obese person spends about \$92,235 per year (Liu et al. 2018). This

cost is inclusive of cost for absenteeism from workers which increases healthcare cost for employers.

Cost for Families

Obesity results in a financial burden on families. The family members have a duty of caring for the obese patient especially when the patient is unable to work. The family members have to offer transportation to and from the physician which increase the healthcare cost. Also, the family members will have to take off from work to take the obese patient for a clinical appointment (Liu et al. 2018).

Cost for Population

Obesity poses a big financial burden on patients, families and the nation at large. The cost for obesity in the United States is estimated to be \$210 in a year. About 6% to 20% of Medicare expenditure goes to adult obesity. It is projected that the cost of managing obesity-related complications will increase from \$48 to \$66 billion per year by 2030 when over 50% of the Americans will be overweight (Liu et al. 2018).

Health Promotion

The best health promotion practice in an outpatient clinic may include addressing the behavioral well-being of the patient and providing patient education regarding exercise and diet. The patient needs to be educated about the risk factors associated with obesity as well as interventions to manage obesity. I will identify obese patients who have the desire to lose weight. After establishing a good relationship with them, I will begin educating them on the importance of weight loss through strategies such as exercise and diet.

Implementation Plan

I will employ three strategies to implement best practices for managing obesity. These strategies include education, referrals, and making a follow-up phone call for a patient. The patient education will focus on weight loss management. Patients with a BMI of 30 will be advised to focus on losing weight to achieve a healthy weight.

The second strategy I will use is through referrals. I will make referral cases to social services, dieticians, and case managers. This multidisciplinary team will help to identify the health needs of the patient and help in weight loss programs. The third strategy which I will use in the implementation of a weight loss program is through asking the patient if they prefer a follow-up phone call. Follow-up phone call while ensuring that the patient is receiving education, referrals and any follow up which is needed.

Evaluation Method

To determine the effectiveness of these methods, I will interview the patients about their demand for weight loss interventions. I would ask the patients if they found the education materials useful. I will also examine the patient's chart to determine the success of the referrals. Lastly, I would assess the follow-up phone call to address what could have been perfected to promote effective obesity management and a healthy lifestyle.

References

- Alston, J. M., & Okrent, A. M. (2017). Obesity in America. In *The Effects of Farm and Food Policy on Obesity in the United States* (pp. 13-53). Palgrave Macmillan, New York.
- Liu, J., Lee, B., McLeod, D. M., & Choung, H. (2018). Framing Obesity: Effects of Obesity Labeling and Prevalence Statistics on Public Perceptions. *Health Education & Behavior*, 1090198118788907.
- National Heart, Lung, and Blood Institute. (2017). Morbidity and Mortality: 2012 Chart Book on Cardiovascular, Lung, and Blood Diseases, February 2012.
- Ogden, C. L., Carroll, M. D., Kit, B. K., & Flegal, K. M. (2014). Prevalence of childhood and adult obesity in the United States, 2011-2012. *Jama*, 311(8), 806-814.
- Seidell, J. C., & Halberstadt, J. (2015). The global burden of obesity and the challenges of prevention. *Annals of Nutrition and Metabolism*, 66(Suppl. 2), 7-12.