Behavioral Model Addressing Obesity in the United States

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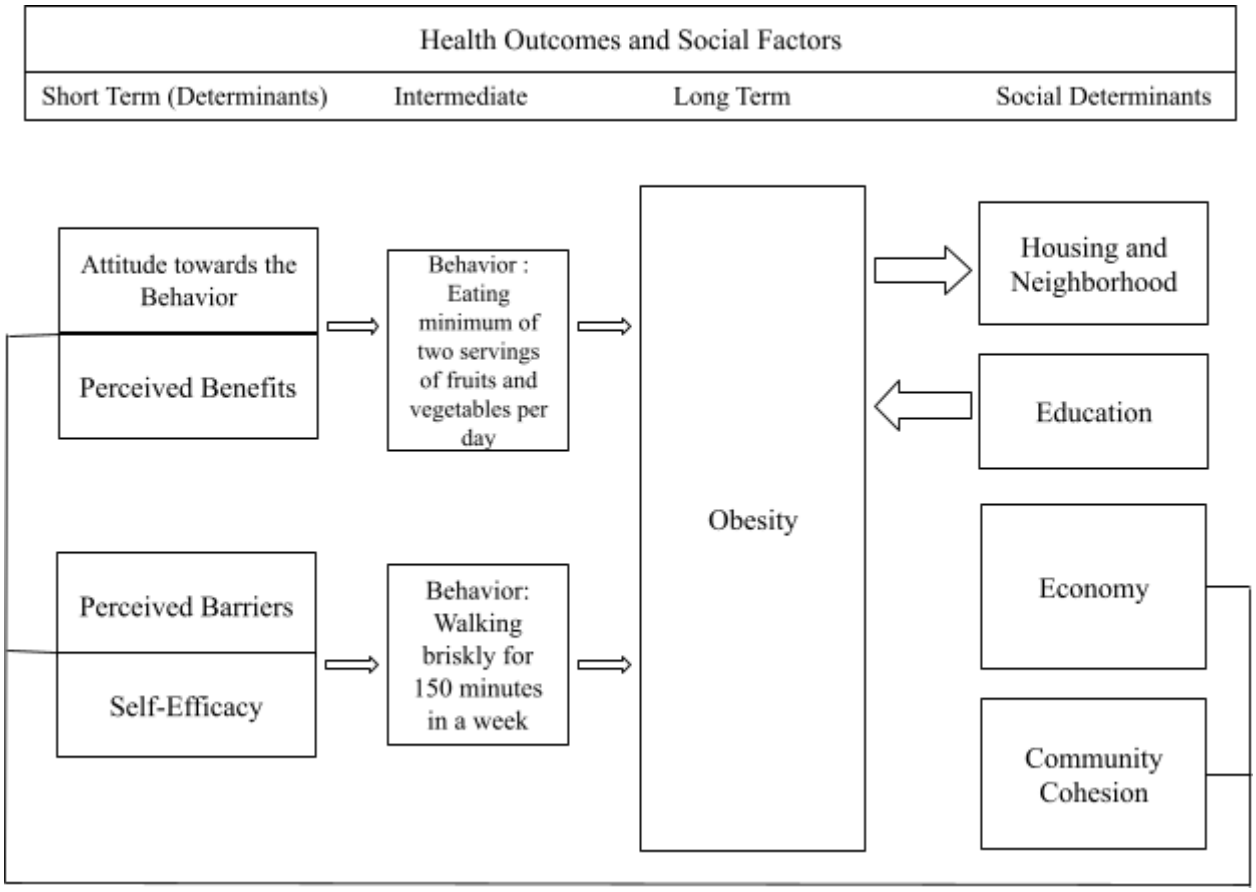
Table of Contents

Behavioral Model



Health Issue

Obesity or Overweight is defined by CDC (2021) as the weight of the person higher than the weight which is considered healthy for a given height. The most basic & commonest method to measure Obesity is by calculating BMI (Body Mass Index) of the person. BMI is calculated by dividing the weight of the person in kilograms by height in square meters (CDC 2021). BMI above 30 for adults is considered Obesity.

The prevalence of Obesity in the United States among adults aged 20 to 39 yrs is 40% , 40 to 59 yrs is 44.8% and 60 yrs above is 42.8% (CDC 2021). Moreover, it is highest among Non-Hispanic black adults 49.6% (CDC 2021). In Jefferson County, Mississippi state has the highest Obesity rate which is 54% among adults aged 20yrs and above (County Health Rankings and Roadmaps, 2021). Tamm and Philip (2020) stated that there is 50% to 100% increased mortality rates among individuals with severe obesity when compared to healthy people.

Etiological factors of Obesity include physiological, psychological, genetic, environmental, economic, social and political factors (Susan et al., 20003). Environmental and behavioral factors like sedentary lifestyle habits, dense calorie food intake, etc are the major causes responsible for drastic increase in Obesity in the past two decades (Susan et al., 20003).

As one third of US adults are considered Obese, health care organizations and federal agencies constantly emphasized Obesity as a threat to the populations long term health (Iliya, 2020). Several studies have confirmed the association of Obesity with variou health outcomes such as diabetes, cardiovascular disease, neurodegenerative disorders, osteoarthritis, disability and it accounts for 40% of all cancer diagnosis (Iliya, 2020).

Obesity is a non communicable disease and major cause of preventable deaths in the USA (Osama, 2021) and its association with physical and psychological comorbidities makes it a serious public health concern. Research studies revealed a monotonic association between Obesity and mortality (Hanfei et al., 2018). Obesity increases cardiovascular mortality rates by 4 folds, cancer related mortality rates by 2 folds, and overall cause mortality rates are increased by 6 to 12 folds (Osama, 2021). Life expectancy of obese people is reduced by 20 yrs in men and 5 yrs in women (Osama, 2021).

The relation between Obesity and Socioeconomic Status (SES) varies by race, sex and ethnicity (CDC 2015). Among women obesity incidence increased with decreases in income and among men especially non-Hispanic Black and Mexican American obesity increased as income increased (CDC 2015).

There is notable change in public awareness about obesity. Only 2 to 3 % of people considered obesity as a significant health issue in early 2000 but now the recognition has drastically increased (Claudia et.al., 2011). Despite of increased awareness and recognition obese individuals face decsrimation as a result of stigmatization (Claudia et.al., 2011). Therefore Public Health should focus on removal of stigma among obese individuals which in help them to follow participate in campaigns related to obesity.

Social Determinants

According to Sandra. G et al., (2012), the multilevel (e.g., countries, states, communities, neighborhood) ecological model of obesity considers the multistructural components (e.g., socio-economic status, physical environment) and multifactorial lifestyle behaviors (e.g., physical activity, dress, diet) at multi-institutional levels (e.g., school, family, local government or agencies). Behavioral factors (proximate determinants) of obesity include lack of physical activity, intake of calorie dense food, medication, television watching, and education (CDC, 2020). Review of the literature focuses on Housing & Neighbourhood and Education Social determinants of obesity.

Neighbourhood food environment plays a crucial role in food choices of individuals and there is a strong association between surrounding neighbourhood, availability of food, dietary behaviors and obesity (Gordon-Larsen, 2014). Neighborhoods with quick access and low price of energy dense food, sugar sweetened beverages, increased price of fruits, vegetables influence dietary behavioral choices of individuals (Gordon-Larsen, 2014). Therefore, individuals living in such neighbourhood end up consuming calorie dense food and become Obese.

Increased physical activity can help in preventing unwanted weight gain and reduce mortality risk associated with obesity (Ladabaum et.al., 2014). Physical activity and weight status have a strong association with neighbourhood environmental facilities such as walkability and access to recreation centres (Sallis et.al., 2010). "Briefly, living in walkable neighborhoods, characterized by a mixture of land uses, connected streets, and high residential density, is positively related to active transportation, and living in close proximity to public and private recreation facilities and sidewalks is positively related to active recreation" (Sallis et.al., 2010). These kinds of "active- supportive" neighborhoods have lower rates of Obesity or Overweight (Sallis et.al., 2010).

Education plays an important role in lowering BMI, reducing risk factors associated with obesity and thereby improving health (Kim, 2016). Education helps individuals to understand the risk factors associated with obesity and educated people lead a healthier lifestyle through nutritious dietary habits, physical activity and regular health care (Park and Kang, 2008). Educated individuals have good income, have easy access to better health care and are less likely to become obese (Kim, 2016). The social network or the peer group of educated people provide effective physical, emotional and financial support to promote health when compared to other peer groups (Kim, 2016). Therefore, education helps in decreasing the prevalence of obesity in the United States.

When compared among non-Hispanic white, non-Hispanic black and Mexican-American women the prevalence of Obesity is less among those with a college degree than a highschool diploma (CDC, 2015). The prevalence of obesity is lower among men and women with a college degree than a highschool diploma (CDC, 2015).

Refined Health Focus

Review of this literature focuses on reducing weights among adults already diagnosed as obese i.e. BMI greater than 30 and above. Reducing weights in obese adults is important because obese individuals are at the highest risk of developing co-morbidities associated with obesity. Moreover, NIH research studies (2016) indicated that metabolic functions of the body has improve by reduction of 5% of weight in obese adults.

Behaviors Considered

Behaviors play a key role in physical, social and psychological well being of a person (NIH 2007). A dynamic relation between genetics and environment results in individual behavioral action and some behaviors are conscious and vary from culture to culture while some are instinctive (NIH 2007). Behaviors considered in this literature review are physical activity, eating and sleep behaviors related to Obesity.

Physical Activity Behaviors

Physical activity is important in maintaining the energy balance of the body, which is required to reverse or prevent obesity (John & Kelliann, 2011). It is a stimulus when appropriately controlled, leads to substantial improvements in energy and macronutrient balance regulation and overall body functioning, i.e. precise body homeostasis regulation (Jean-Philippe et.al., 2011).

The obesity prevalence is more than 30% among US adults who report no leisure-time physical activity (Barnes, 2012). Healthcare practitioners and public health workers dealing with obese patients should be aware about the importace of physical activity in obesity and should be more innovative to motivate people to excercise (John & Kelliann, 2011). Lack of exercise is perceived abnormal and is strongly associated with several risk factors (Jean-Philippe et.al., 2011).

Scientific research studies reported in 2008 Physical Activity Guidelines for Americans indicates that in obese adults, 1% to 3% of body weight can be reduced by performing physical activity at moderate-vigorous intensity (e.g., brisk walking) of 150 minutes per week (John & Kelliann, 2011). Research studies also stated that weight stability can be achieved by doing moderate-vigorous intensity walking for 4 miles-an-hour for about 150-300 minutes (5hrs) a week for a year (2008 Physical Guidelines for Americans, pg 23).

Eating Behaviors

Obese people exhibit inconsistent dietary behavior with little or no corelation between hunger feelings/fulness and eating (Blundell & Gillett, 2012). Current obesity management highlights the necessity of healthy eating behaviors which includes increase in nutrient rich food, decrease in calorie dense food and reduce total energy density (Smethers & Barbara 2018).

Energy density (ED) is a measure of energy per gram of food (kcal/g) and is influenced by a variety of food factors including macronutrients and water content of the food (Vernarelli et.al., 2014). Control of eating behaviors are influenced by biological processes, environmental processes, self-imposed modulations and attempted self control (Blundell & Gillett, 2012)

A research study done by K. He.et.al., (2004) on 74,063 female nurse 38-63 yrs demonstrated that women who ate two servings of fruits and vegetables in a day had 25% less risk of becoming obese, and women who ate three servings per day hasd even lower risk of becoming obese. Moreover, fruits have low energy density and provide greater volume of food where people experience fullness by consuming fewer calories (CDC, 2020).

Participants in Multiple Risk Factor Intervention Trial (MRFIT) were recommended to eat less fat (less than 35% energy from fat) by increasing fruit and vegetable (5 or more servings per day)intake in order to reduce weight, improve blood lipids and blood pressure (Dolecek et.al., 1997). Participants who included 5 or more servings of fruits and vegetables have lost a significant amount of weight (Dolecek et.al., 1997).

Sleep Behaviors

Sleep helps in maintaining many psychological issues like immune system functioning, body metabolism, hormonal balance, learning, emotional and mental well being (Bonanno et.al., 2019). Sleep deprivation increases the risk of obesity in adults resulting in dysfunctional dietary behaviors, increased physical inactivity and metabolic changes (Bonanno et.al., 2019).

Research studies indicate that prevalence of obesity has increased by 55% in adults who have short sleep cycles (Cappuccio et.al., 2008). Experimental studies stated that lack of sleep may result in increased serum ghrelin levels and decreased serum leptin levels resulting in increased appetite (Taheri et.al., 2004). Sleep deprivation can impair self control and decision-making abilities as well as enhance the brain's response to food (St-Ong et.al., 2012) . Sleep deficiency is also related to increased consumption of food high in calories, fats and carbs (Brondel et.al., 2010). According to the CDC recommended sleep for adults (18-60 yrs) is 7 or more hours per night (CDC, 2017). Studies made by Buxton and Marcelli (2010) with 56,507 US adults (18-85yrs) demonstrated that there is 6% probability of increase in obesity among adults who had less than 7 hrs of sleep per night.

Final Behaviors

Final Behaviors considered are

- A minimum of two servings of fruits and vegetables per day.
- Walking briskly for 150 minutes in a week

Collectively, the evidence from studies with valid measures highlighted the importance of eating and physical activity behaviors over sleep behavior. Fruits & vegetables intake and walking briskly for 150 minutes in a week has their strong association with weight reduction. Moreover, they appear as stronger predictors of weight maintenance. Regular physical activity not only reduces weight but also helps to maintain body homeostasis regulation. Adequate intake of fruits and vegetables has been linked to lower the incidence of not only obesity but other non communicable diseases in epidemiological studies(Dhandevi, 2015). Therefore, A well planned behavior nutrition and physical activity education is important to handle the obesity epidemic among adults in the US.

Behavioral Determinants

Physical Activity Behavior: Walking briskly for 150 minutes a week.

Perceived Barriers

Environmental, demographic, socio-economic factors and exercise mode highly influence Physical activity and its barriers to participation (Sebastiao et.al., 2012). External barriers of physical activity relate to the neighborhood environment of individual and internal barriers refers to lack of motivation and time (Herazo et.al., 2017). According to Reichert et.al., (2007) the commonest perceived barrier is lack of money, followed by feeling exhausted, lack of company, time, fear of injury and least frequently reported barriers were age and disliking of physical activity. Research studies made by Reichert et.al., (2007) reported that individuals who had less leisure time reported increased physical inactivity. Dawson et.al, (2007) in their studies observed that more than half of the individuals in their sample reported at least one barrier to physical activity, poor health was the commonest barrier. Environmental barriers for physical activity reported by African Americans and the low-income population were unsafe walking areas in the neighborhood, lack of transportation and childcare, peripheral neuropathy, and degenerative joint diseases (Gareth et.al., 2005). Therefore, interventions targeting above -mentioned barriers are important to improve physical activity behaviors among individuals, which ultimately results in a decrease in Obesity and other related non-communicable diseases.

Self-Efficacy

The review of this literature focuses on the positive correlation between self-efficacy for physical activity behavior. Self-efficacy for physical exercise is related to an individual's personal belief about their ability to participate in regular physical activity and the advantages of doing it (Schwarzer & Renner, 2000). Albert Bandura's, Social-Cognitive Theory of self-efficacy was found to be very effective in better understanding physical activity behaviors among adults in the United States (Jessica et.al., 2008). According to Bandura, forethought governs human motivation and behavior, and this is based on two types of beliefs, self-efficacy and outcome expectancies (Bandura, 1995). Self-efficacy for physical activity is measured through the Physical Exercise Self-Efficacy Scale (PESES). A high PESES score indicates high confidence in an individual ability to participate in regular physical activity and a low PESES score indicates low confidence (Brown, 2005). Research studies found that having a higher level of self-efficacy in physical activity increased the rate of individuals engaging in physical activity (Jessica et.al., 2008). Perceived barriers related to physical activity contribute to individual self-efficacy to exercise. Therefore, in adult's self-efficacy can be strongly influenced by physical activity combined with a multidisciplinary approach and for a specific behavior, if self-efficacy is obtained once, there is a possibility for continuation of desired health outcome (Cataldo et.al., 2013). Results from several research suggest that public health should emphasize the development of interventions that can enhance an individual's confidence in physical activity participation.

Eating Behavior: Eating a minimum of two servings of fruits and vegetables per day.

Attitudes towards the behavior

In several studies, it is shown that attitudes towards consumption of a healthy diet can be improved by improving an individual's knowledge of nutrition (Irene & Lauren, 2013). Food attitudes related to ethnicity are fiber being an important part of diet among Hispanics and African Americans (Irene & Lauren, 2013). The variables related to the attitudes towards food were substantially different between ethnicities in response to the importance of fiber and low-fat intake (Irene & Lauren, 2013). The study conducted by Irene and Lauren (2013) revealed that the majority of the subjects accepted the importance of fruits and vegetables in the daily intake but only 62.1% agreed fiber is important which brings to the conclusion that lack of knowledge regarding sources and benefits about fiber half of subjects have negative attitudes towards it. Therefore, nutrition education is important to change attitudes towards foods (Irene & Lauren, 2013). Positive food-related attitudes are always linked to a nutritious diet (Anju et.al., 2014). Research studies made by Anju et.al., (2013) indicate that the daily intake of fruits and vegetables among those with a little positive attitude is nearly 1.13 servings and among those with high positive attitudes consumed 2.25 servings in a day. Studies made by Anju et.al., (2013) also stated that shoppers with positive attitudes towards healthy eating were not restricted to high-cost supermarkets but they shopped at low and medium-cost supermarkets also. Therefore, it draws to the conclusion that a positive attitude is important in diet quality among shoppers and is independent of socioeconomic status (Anju et.al., 2014). The attitude of youth towards healthy and unhealthy food is mixed and females have more positive attitudes compared to males as they understand the connection between food and obesity (Allison et.al., 2013).

Perceived benefits

Regarding the consumption of fruits and vegetables, many studies have reported that perceived benefits are one of the important factors to be considered (Pawlak & Colby, 2009). Perceived benefit of diet quality is related directly to healthy dietary behaviors such as low-fat intake from high-density food and increased consumption of fibrous foods, fruits, and vegetables (Beydoun & Wang, 2007). Intrinsic benefits like increased life expectancy, weight maintenance or reduction, and feeling better or being healthier were found as top predictors for fruit and vegetable consumption (Moser et.al., 2005). However, research made by Pawlak & Colby (2009) stated that intrinsic benefits of a healthy diet received the highest score from all benefit statements. Moreover, Higher scores for perceived benefits and lower scores for perceived barriers in a study conducted among African American living indicates how people are seeing many benefits and few obstacles towards nutritious food (Pawlak & Colby, 2009). Data from several studies regarding the perceived benefits of healthy eating include improvements in cognitive and physical performance, fitness, psychological stability, and feeling healthier (Salahshoori et.al., 2014). A research study conducted by Beydoun & Wang, 2007 indicates that perceived benefits for diet quality scores were high among women when compared to men.

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