

Childhood Obesity Treatment of Elementary Aged Children

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By

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Abstract

Childhood obesity (ages 2-19) is at epidemic proportions in the United States (US). The current prevalence of childhood obesity is 18.5%, which is about 13.7 million children. A plan for the initiation of pediatric obesity treatment is essential. This will result in correctly diagnosing and initiating a wholistic approach to obesity treatment. The longer an individual has had obesity, the more likely they are to develop a comorbid condition, especially if onset is in childhood. Therefore, action at Elementary age (5-10 years old) is crucial. The goal of this project is to create evidence-based protocol (EBP) for the treatment of childhood obesity and comprise a well-rounded, wholistic approach to the treatment of childhood obesity. The following paper includes a developed EBP treatment plan for obese pediatric patients, educates on the many factors that contribute to the obesity epidemic and describes how patient monitoring and follow-up care will be carried out. The information found in the paper is from multiple research articles that studied childhood obesity. The use of this plan to effectively initiate pediatric obesity treatment will positively impact the health of the children in the US. Early identification and prevention of childhood obesity will create healthy habits in our youth, which they will take into adulthood, preventing future co-morbid conditions.

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Introduction

The Centers for Disease Control and Prevention (CDC) defines childhood obesity as body mass index (BMI) greater than the 95th percentile in a child's age group. BMI uses a child's weight and gender, then compares these values to those of their peers. Using this scale, obesity is diagnosed which can lead to a variety of serious and life-threatening health problems. These comorbidities include type 2 diabetes mellitus, heart disease, high cholesterol, high blood pressure, stroke, cancer, asthma, and osteoarthritis. Obesity, especially in children, can also lead to poor mental health. The longer an individual is obese, the more likely they are to develop a comorbid condition (New York State Department of Health (NYSDH), 2020).

The prevalence of childhood obesity (ages 2-19) in the United States is 18.5%, which is about 13.7 million children (CDC, 2018). In NYS, it is estimated that about a third of children are obese or overweight. The prevalence of childhood obesity increases as the child's age increases, so it is important to create healthy habits early in life. Eating high calorie, low nutrient foods and beverages, not getting enough sleep, not getting enough physical activity, and spending too much time sedentary are all contributing factors to the obesity epidemic. The current recommendations are that children eat a variety of fruits, vegetables, whole grains, lean protein, and low-fat dairy products. It is also recommended that children limit intake of added sugars, solid fats, and sodium. Elementary age children are just starting to learn about life and go to school, so it is a great time to start teaching healthy strategies for the future. If a healthy lifestyle is established early in life, the child is more likely to carry it with them through life (NYSDH, 2020).

It is well known that treatment is more costly than prevention. It is estimated that \$14 billion per year are spent on obesity-related illnesses in the American healthcare system (Durbin et al., 2018). Total annual healthcare costs for obesity in NYS are estimated at \$11.8 billion. These costs can be limited by preventing obesity in the first place. The best way to prevent adult obesity, is to decrease the prevalence of childhood obesity and teach children healthy habits from a young age (CDC, 2013).

Goal

The goal of this project is to review the former and current strategies for the treatment of childhood obesity and comprise a well-rounded, wholistic approach to the treatment of childhood obesity. As well as address the major factors that affect obesity treatment.

Methods

For this project, I used the SUNY Brockport Library to launch the following databases (CINAHL Complete and MEDLINE). I also used CDC, American Academy of Pediatrics (AAP) and Heathy People 2020 to reference. Search terms used were “childhood obesity”, “guidelines”, “recommendations”, “pediatrics”, “stigma” and “treatment”. Inclusion criteria was full text, published in the last seven years, English and peer reviewed articles.

Literature Review

Biology

Genetics, age, gender and race all influence the likelihood of a child becoming obese. Throughout childhood, as age increases so does the risk of developing obesity. Puberty is a huge developmental milestone that occurs during childhood. Puberty affects boys and girls differently,

and at different rates. Boys are more likely to face obesity before puberty, where girls are more likely to face obesity after puberty. Also, as a child gets older, they start having more individual freedoms to choose what they want to do. According to Healthy People 2020, the largest spike in obesity prevalence is between the ages of 6 and 11, when children are in Elementary school. Therefore, this is a crucial age group to target resources. If healthy behaviors are established at a young age, before the child's body changes and before they have more individual choice, the child will already have the tools to live a healthy life, decreasing their chance of obesity (Healthy People 2020, 2014).

Obesity disproportionately affects race. Black (~22%) and Hispanic (~21%) children are more likely than White (~14%) children to develop obesity. Therefore, increased efforts to prevent childhood obesity should be targeted towards Black and Hispanic communities (Healthy People 2020, 2014).

Research shows that there are genetic factors related to the development of obesity. A 2018 study looked at genetic code of children, counted the number of BMI increasing alleles, and from that looked at whether the predisposition to obesity was statistically significant. The number of BMI increasing alleles were converted into a polygenic risk score (PRS). A higher PRS indicates an increased genetic risk of obesity. The study concluded that the relationship between PRS and a child developing obesity was not statistically significant. Instead, they found that a high PRS is largely offset by a healthy lifestyle. Therefore, no matter the child's calculated risk for obesity, if they practiced a healthy lifestyle, the child did not develop obesity (Fang, et al., 2018).

Individual Behaviors

A child's individual behaviors are a strong indicator of their obesity risk. Behaviors such as consuming high calorie, low nutrient foods and beverages, lack of sleep, lack of physical activity and a sedentary lifestyle are all contributing factors to the obesity epidemic (CDC, 2018). Children tend to prefer foods high in fat, sugar, and sodium such as pizza, candy, chips and pop. Today, children spend more time than ever on the couch watching television (TV) or playing video games and less time outside playing. These behaviors should be done in moderation to help the child live a long, healthy life. The current recommendations for children (6-17) are to eat a variety of fruits, vegetables, whole grains, lean protein, low-fat dairy products and to participate in at least 60 minutes of moderate to vigorous physical activity every day (CDC, 2018). Many children are failing to reach these goals.

Socio-Environmental

The social and environmental exposures a child experiences can lead to the development of obesity. In an environment where the family is obese and consistently practicing unhealthy behaviors, a child is more likely to be obese. Specifically, if one parent is obese the child has a 50% chance of obesity and if both parents are obese, the child has an 80% chance. In situations where multiple family members are obese, the cause lies in shared behaviors that they learned. If parents teach their child unhealthy eating habits, the child will most likely continue these habits into their adult life (University of California San Francisco (UCSF), 2020). Today, most childhood influences teach that "yummy" foods are unhealthy and "yucky" foods are healthy. The stigma created against healthy foods is a leading cause of unhealthy choices made by children. Education about nutritional benefit and positive attitudes towards healthy foods can help change a child's viewpoint, consequently improving their diet. It is important to help

children create a healthy relationship with all foods, so they have a healthy balance. In a world that is increasingly sedentary and unhealthy, moderation can be the changing factor (Polfuss et al., 2020).

A child's social interactions can also influence their obesity risk. Bullying is a serious risk factor for obesity. It has been proven that adolescent girls who were teased about their weight at baseline were about two times more likely to be overweight 5 years later (Golden, 2020). The bullying experienced by children is mostly driven by "weight stigma". According to the American Academy of Pediatrics (AAP), "Weight stigma refers to the societal devaluation of a person because he or she has overweight or obesity and often include stereotypes that individuals are lazy, unmotivated, or lacking in willpower and discipline (Pont, et al., 2017, p.2)." Constant bullying and isolation hinder the child's attempt at recovery. Isolation leads to decreased physical activity due to a lack of people to play with and it increases food consumption because of an abundance of free time and hopeless feelings. Nobody wants to feel this way. The bullying and emotional trauma that is associated with obesity is preventable. Preventing and treating obesity can help increase mental health, confidence, and quality of life (Pont, et al. 2017). As healthcare professionals, it is important to be mindful of tone and attitude when addressing an overweight or obese child. Obesity does not define the child; they have a diagnosed condition that we must work to treat.

Healthcare Services

Access to healthcare is very important to assess risk factors for obesity in children. Providers keep track of the growth and development of their patients and they initiate treatment when something concerning arises, such as obesity. Once a child is obese, monitoring for other

complications is suggested. It is important that children have access to these services to keep them healthy. Children that live in poor, rural, single parent households are less likely to have access to healthcare. Therefore, if the child is obese, they may not have access to the resources needed to receive treatment (Healthy People 2020, 2014).

Healthcare provider knowledge and compliance of obesity prevention and treatment guidelines is crucial to care for obese children. A study of medical students found that 74% of the medical students were unfamiliar with the obesity screening recommendations. In order to provide adequate care to potentially obese children, providers must know how to screen for obesity. The provider must assess a child's BMI, symptoms related to obesity, social risks, environmental risks, diet, and activity. From that comprehensive assessment educate and/or refer the patient to the appropriate resources within the medical field (Guseman et al., 2019).

Compliance is an extremely important issue when it comes to childhood obesity. Many providers do not comply with the current guidelines and recommendations for obesity prevention and treatment. One cannot simply tell a child they are obese, but not give them the tools to better themselves. When new or trial guidelines are created, many providers do not comply with those either (Stratton, 2021). This creates an inefficient system. Obesity prevention cannot effectively occur without the support and compliance of providers.

Policy

Policy making can affect childhood obesity. Local governments fund many resources that are advantageous to children. They fund the building and maintenance of playgrounds and community events such as group exercise and youth sports. These resources provide children with a safe place to participate in physical activity. Government resources are also prevalent in

schools. Children can receive free lunches, take health education classes, and participate in physical education classes. For some children, free lunches may provide the only nutritious food they will receive that day. Health education and physical education both help children acquire the skills and knowledge base to remain healthy throughout their lives.

Current Interventions

Since childhood obesity is the second leading cause for preventable death in the US, there are many interventions currently present to manage the epidemic (CDC, 2018).

School

A currently program being tested in schools is the Recess Enhancement Program (REP). This study used 25 New York State schools and evaluated whether REP increased the rate of vigorous physical activity in elementary schools. This program provides more adult supervision and a larger variety of equipment at recess time such as jump ropes and holla hoops, alongside a well-maintained playground. The REP only includes 25 minutes of recess, which is far lower than the current guidelines for at least 1 hour of physical activity for children every day. It was found that in REP schools the rate of vigorous physical activity was 52% higher than non-REP schools. The schools compared had similar demographics and socioeconomic statuses (Chin & Ludwig, 2014). REP highlights an effective, and low-cost way to increase physical activity in schools. Modifications could be made to the program to increase the length of recess times to better meet the physical activity requirements of children (60min/day). Overall, based on the overwhelming increase in vigorous physical activity, this program should be adapted into more schools state-wide.

WIC

WIC is a program for Women, Infants and Children, which provides nutritional education, breastfeeding support, referrals, and nutritious foods. To qualify, one must live in New York State, meet income limits, and have dietary need. Nutritional advice provided includes, learning how to make healthier food choices and become more active, nutritionists available to help you plan healthy meals and support groups to talk to other parents about their nutritional plans. WIC can also refer parents to additional services that they may qualify for such as: Medicaid, Supplemental Nutrition Assistance Program (SNAP), Family Planning, Domestic Violence support and Head Start. These services help mothers create a healthy start for their children, decreasing their risk of obesity. Recent studies on WIC services and its like to obesity prevention have shown that children on WIC eat healthier food, do better in school and are more likely to have a healthy weight. According to a NYS study on the WIC program, 15.1% of children were obese at the start of the WIC program. After interventions, they found statistical significance that children were less likely to be obese, accounting for race/ethnicity, birthweight and birthplace (Chiasson, et al., 2016). The most recent obesity statistic on children in the WIC program, is 13.9% of WIC children are obese, which is less than the state average for childhood obesity in NYS (NYS Department of Health, 2020).

The WIC program is a quality example of how prevention services and early education to both parents and children can effectively decrease the prevalence of childhood obesity. The participants are provided with nutritional advice, physical activity advice and the required resources to use the advice given. It would be beneficial if WIC programs were expanded to a greater percentage of the population. Currently, only specific population qualify for WIC due to their income. Providing WIC resources to more families, could help to prevent childhood obesity on a larger scale.

Proposed Interventions

Prevention

Physical education is losing importance in schools. Many schools are cutting back on their physical education programs to increase time in the day for science, technology, engineering, and mathematics (STEM) classes. Physical education extremely important, now more than ever. Not only does physical education encourage children to be more active, but it also gives them a well-deserved and needed break from their mentally taxing classes. Physical education teaches children about healthy behaviors and many different forms of physical activity, so the child can find something they like to do. It can be argued that instead of decreasing physical education programs in schools, physical education should be increased with the addition of nutrition classes.

It is important for interventions to be started at a young age. Elementary school is a great time to start. Much of New York States data involves increasing activity and education to upper grade levels. For example, NYS Center for School Health (2019), states that 98% of schools in NYS taught grades 6-12 about increasing daily physical activity. Although this is a positive statistic, NYS fails to say how increasing physical activity was taught and if it had a beneficial impact on child weight status.

Every year that a child is in school they should be required to take both a physical education class and a nutrition class. This promotion of healthy behaviors, uniformly throughout school, can help decrease the prevalence of childhood obesity. Physical education classes should include a variety of ways a child can perform physical activity. This will help the child find something they like to do, so physical activity is not a chore, but something they enjoy. Nutrition

education classes should focus on creating a healthy relationship with food, where moderation is encouraged. A teacher should never make a child feel guilty about what they are eating. It is important to have a positive approach, to help the child understand that they can have a balance of both “healthy” and “unhealthy” foods. Not only could these programs help decrease a child’s chance of developing obesity, but it may also help decrease the prevalence of eating disorders by creating a positive relationship with food and physical activity.

Treatment

All interventions should be individualized to each patient and their families

Assessment

- 1) Identify the child’s BMI and preform a physical exam. (Children >2 years old)
- 2) Identify waist to hip ratio.
- 3) Obtain baseline vital signs.
- 4) Determine if the findings of the exam are concurrent with their BMI.
- 5) Based on the total assessment, classify as overweight, obese, or morbidly obese (CDC, 2018).
 - a. Overweight: <85th percentile for their age group.
 - b. Obese: ≥95th percentile for their age group.
 - c. Morbidly Obese: >99th percentile for their age group.
- 6) Gather information about the child’s current dietary intake and physical activity.
- 7) If obese or morbidly obese, draw labs to check for comorbid conditions.
- 8) No judgement should be displayed.

Rationale.

It is extremely important to make sure the physical exam and BMI match. BMI can be skewed by muscle mass. Some athletic children that have more muscle than the average child could have a BMI score higher than their physical exam shows. These children should not be classified as overweight or obese (CDC, 2018). Gathering baseline information will help see progress or the lack of progress at future visits. The baseline will also help the provider create an individualized plan of care for the child, which is extremely important because not all overweight or obese kids struggle in the same area of treatment. It is becoming more common for obese and morbidly obese children to develop comorbid conditions such as cardiovascular disease (CVD), obstructive sleep apnea (OSA), type 2 diabetes mellitus (T2DM), gastroesophageal reflux disease (GERD) and non-alcoholic fatty liver disease (NAFLD). Therefore, drawing labs can identify if a comorbid condition is present, so the proper treatment can be initiated (Polfuss, 2020).

Nutrition/Diet

- 1) Suggest limiting the intake of added sugar (food & drink), high-sodium foods, fast foods, and fried foods (HP2020, 2014).
- 2) Encourage the consumption of fruits, vegetables, low fat dairy products, and lean protein (HP2020, 2014).
- 3) Discuss with the child and family about proper portion sizes. A child does not need as much food as an adult does.
 - a. A child should never be forced to finish their plate.

- 4) Educate the family on the concept that what the child sees them eat greatly influences what the child eats. Participating in lifestyle changes with the child is proven to be beneficial (Pratt & Skelton, 2018).
- 5) Encourage family meals (Pratt & Skelton, 2018).
- 6) OVERWEIGHT
 - a. Suggest change in diet.
 - b. Give resources to show what is healthy and foods the child should be consuming.
 - c. Do NOT restrict food. Just encourage making healthier choices.
- 7) OBESE
 - a. Collaborate with a dietician/nutritionist (Stratton, 2021).
 - b. Give the child a more detailed description of what each meal should look like and how much food should be on the plate.
 - i. It is important to make changes slowly, so the child is not overwhelmed and is getting enough daily nutrients to maintain their needs.
 - ii. At every visit, look out for the development of an eating disorder. Eating disorders can happen no matter what weight a person is at.
- 8) MORBIDLY OBESE
 - a. Refer to a dietician/ nutritionist. Schedule regular appointments for the child. (Stratton, 2021).
 - b. Create a specific meal plan to follow, giving options of what the child can eat, but controlling the type of food and portions.
 - i. Follow-up with nutritionist to create new meal plans weekly for the child.

Rationale.

Portion sizes and diet are extremely important when it comes to the treatment of childhood obesity. One of the best ways to encourage healthier behaviors is family mealtimes, where they sit down, eat, and talk about their days. Home cooked meals are shown to be healthier and to have more reasonable portion sizes than going out for food (Pratt & Skelton, 2018). It also helps that the child is not choosing what they want for the meal, the parents are. So, it can help the child learn healthier strategies when it comes to food. For the child to lose weight, they must create a caloric deficit. At the obese and morbidly obese stages, referral to a dietary specialist can help create a plan for the child to follow (Stratton, 2021). It is important to still include some “unhealthy” foods into the diet to show the child how to eat in moderation. This will help the child make a lifestyle change instead of a diet because diets tend to elicit rebound weight gain after completion. The goal is to create a sustainable diet so the child can learn important dietary skills for the future (Polfuss, 2020).

Physical Activity

- 1) If physical activity is the area of struggle help the family create an activity schedule or log that may help motivate the child.
- 2) Suggest the child is enrolled in a youth sport.
- 3) Educate that the recommended amount of physical activity for children is 60 minutes of vigorous physical activity at least 5 days a week (CDC, 2018)
 - a. Go from the child’s baseline. For example, if the child can only do 10 minutes, try to increase the amount of time at the intensity of play as the child is ready to do so.

- b. Physical activity is easier to do when it is a game. So, try to make up games or use online activity games to increase motivation (Chin & Ludwig, 2014).
- 4) If physical activity continues to be a problem area for the child and the child is obese or morbidly obese, refer to a personal trainer that may be able to help schedule specific times physical activity will occur and make up new ways to do the activity to make the child more motivated.

Rationale.

Physical activity is extremely important for the human body. Our muscles and joints need to be worked to maintain strength. It is advised that the child start at their baseline and slowly increase their activity from there. A child that is physically active and that is making the correct changes in their diet will have a better chance of losing weight. Even more, it has been shown that participating in physical activity is the best way to keep weight off, once the child gets to a healthy weight. Movement is also extremely important for the metabolism. Activity helps the bowels get stimulated, which will help with constipation if that is occurring. Youth sports can also be an extremely useful resource for children. It can help the child learn that activity is fun, and they may meet new friends in the process, helping their mental health as well (Chin & Ludwig, 2014). Physical activity has also been proven to increase school performance, increase focus and increase emotional wellbeing (Pont, 2017). In extreme cases, such as morbidly obese children, a personal trainer that is experienced in working with children can help the child create designated times to perform physical activity and create new way of moving, maintaining the child's interest. Therefore, physical activity is a huge part of obesity treatment and should be implemented whenever possible.

Social & Environmental Factors

- 1) Ask about social and environmental concerns.
 - a. Social concerns: bullying, depression, difficulty interacting with peers.
(Williams, 2018).
 - b. Environmental concerns: no access to healthy foods, lack of safe play space, poor access to healthcare, obese family (Chen, Jaenicke & Volpe, 2019).
- 2) If a child is having social issues that could lead to a mental health concern, such as depression, see “Child Displaying Mental Health Concerns” section of this treatment plan.
- 3) If environmental concerns are suspected...
 - a. Refer to social work if the family needs help finding resources such as access to healthy foods, safe play space and access to healthcare.
 - b. If the rest of the family is also overweight and obese, it is important to try to get the whole family involved. It is a lot easier on an obese child to make change, if they see those, they are surrounded by making similar changes, too (Pratt & Skelton, 2018).

Rationale.

As previously discussed in this paper, a child’s environment can greatly affect their ability to recover from obesity. Some families do not have the money and resources to buy healthy food. Healthy food is expensive, but there are food banks and donation resources that can help the family obtain healthy food for their house (Chen, Jaenicke & Volpe, 2019). Social workers are a great resource to help the families find ways to get healthy foods, through

community resources. WIC is also an extremely beneficial program, especially when it comes to access to healthy foods (Chiasson et al., 2016). Social work can also help families find a safe place for the child to participated in physical activity. Places such as community playgrounds, a local track or a youth sports program are perfect for safe play, especially if going outside in their neighborhood is not safe. There are also many types of physical activity that can be done inside, such as an active video game. Social work can help the family find these resources for whatever their needs may be (Chen, Jaenicke & Volpe, 2019).

Child Displaying Mental Health Concerns

- 1) Talk with child, privately. Discuss how school is and how other children treat them.
Ask about their self-esteem and self-image.
 - a. If the patient displays signs of depression, anxiety and/or poor self-image, refer to therapy. OR ensure they have someone safe to talk to at home (Pont, 2017).
 - b. If the family decides the use home interventions for mental health concerns and at follow-up these findings are worse, refer to therapy.
- 2) Assess the severity of the mental health concern.
 - a. If the child is threatening or considering suicide, immediate action is required. Refer to psychology immediately (Hoying & Melnyk, 2016).
 - b. If suicide threat is imminent, impatient psychological care may be needed (Hoying & Melnyk, 2016).
- 3) Group therapy should be utilized for obese children to help them make friends that are more like them (Pont, 2017).

- a. This can help the kids feel like they are not alone.
- b. It can also improve recovery because they can see what everyone else is doing and how they are improving.

Rationale.

One in four (25%) overweight or obese children have a mental health issue (Hoying & Melnyk, 2016). It is extremely important to recognize these issues and treat them appropriately. Since the prevalence of a mental health issue in overweight/obese youth, it must be monitored for at every follow-up visit. Asking the child about school, peers, friends, self-concept, and outlook on life can give the healthcare professional an indication of a mental health concern developing. If the child is displaying symptoms of a mental health issue, they should be sent to therapy or a support group. The child must understand that their weight does not define them as a person and that their life is valuable. Professional help for mental health issues has proven to help decrease depression and anxiety and increase self-concept in overweight/obese patients. It is important to note that if a child is making suicide threats, the proper resources must be called in immediately. For the safety of these children, if suicidal ideation is suspected, the provider should ask if the child is thinking about killing themselves and if so, how they would do it. This can help to create a safety plan for the child. In extreme cases, such as a credible suicide threat, inpatient psychological care may be indicated. Therefore, during obesity treatment it is every health care professional's responsibility to monitor for mental illness and act accordingly for the safety and wellbeing of the child (Hoying & Melnyk, 2016).

Comorbid Conditions

- 1) Draw labs if a comorbid condition is suspected AND if a comorbid condition is already present.
 - a. For a child >10 and obese or overweight with a family history of comorbidities (Stanford, 2017).
 - b. For a child >2 who is severely obese (Stanford, 2017).
- 2) Fast 8-10 hours prior (Stanford, 2017).
 - a. Lipid panel (HDL, LDL, total cholesterol)
 - b. Fasting glucose
 - c. Fasting insulin
 - d. Hemoglobin A1c
 - e. ALT
- 3) Repeat labs
 - a. Every 2 years if normal.
 - b. At least yearly if abnormal.
- 4) If the child has a comorbid condition or is heading in that direction, refer to a specialist in that field, such as a Cardiologist or Endocrinologist.
 - a. Educate the family on the condition and the risk it poses on the child's health.
 - b. Talk with the child and family about how this condition affects their daily lives.
 - c. Discuss what changes can be made to decrease the effects of the condition.
 - d. If medication is prescribed for the condition, educate the patient and family on how to use the medication properly.

Rationale.

Comorbid conditions that can develop as a result of obesity include cardiovascular disease, obstructive sleep apnea (OSA), type 2 diabetes (T2DM), gastroesophageal reflux disease (GERD), hyperlipidemia and non-alcoholic fatty liver disease (NAFLD). To detect if these conditions are occurring, frequent monitoring and diagnostic tests must be performed. The provider should test for T2DM (fasting glucose, fasting insulin and A1c), NAFLD (ALT), hyperlipidemia (lipid panel, HDL, LDL, total cholesterol) (Stanford, 2017). The provider should ask the child and parent about sleep habits, snoring and acid reflux. From the discussion and labs, it should be determined if the child has a comorbid condition. If so, it is important to educate that the best way to control these conditions is to lose weight and increase physical activity. The comorbid conditions can be life threatening and should be treated once recognized. Referral to the appropriate specialist is indicated. The child may be put on medication to help control the comorbid condition. In this case, it is important to educate how the medication is used and if there are side effects associated (Guseman, 2019).

Bariatric Surgery

- 1) Bariatric surgery should only be considered for morbidly obese children that have severe comorbid conditions. To be considered the child would have to not be responding to other types of obesity treatment.
 - a. Must have a BMI >40 or has a BMI >35 with significant comorbid conditions and failure to lose weight at least 5% during at least one year of intervention (Roebroek et al., 2019).

- b. Young children should not be considered for bariatric surgery or should go through thorough screening. It is advised that the child should be an adolescent because of the lifelong change that will take place (Rowbroek et al., 2019).
- 2) If bariatric surgery is considered, the child must be referred to a pediatric bariatric surgery center.
- a. Long term follow-up the child is important after surgery (Polfuss, 2020).
 - i. Must ensure metabolic function is accurate and the child is getting enough calories.
 - ii. Monitor growth and development.
 - iii. Check on psychosocial needs of the child, as this makes them different from their peers.

Rationale.

Bariatric surgery should only be used as a last resort when all other options have been exhausted. The child and family need to be educated on the severity of the surgery and what life will look like after the surgery. It is advisable that bariatric surgery is not considered until the adolescent stage of childhood. After surgery, the child must be monitored closely to insure proper healing, adequate nutritional intake, and adequate mental health. Intensive monitoring of growth and development is also necessary. Therefore, candidates must be chosen carefully. They must have the support system to recover. According to a 2019 study, weight loss and health improvement outcomes occurred with adolescents who received bariatric surgery (Roebroek et al., 2019). The type of bariatric surgery that is suggested for adolescents is gastric banding, due to its

reversibility and does not alter nutrient absorption. It was found that in combination with lifestyle change, bariatric surgery can help an adolescent lose weight and keep weight off. Bariatric can be a good option for an adolescent that has exhausted all other options and is morbidly obese with severe comorbid conditions (Roebroek et al., 2019).

Follow-up Appointments

Follow up appointments and providers following through are crucial for the treatment of childhood obesity. The more frequent the child is checked on, the more individualized the treatment plan can be. The treatment plan can then change according to what the child needs at a more frequent interval. Follow ups are also an important factor for the child's progress (Stratton, 2021). For example, if the child knows they have another appointment in 3 months, they are more likely to keep with the program as opposed to 1 year, which is a very long time. For a child that is increasing weight dramatically or is obese, the yearly checkup is not enough to initiate intervention. Appointments need to be closer together than that. The appointment schedule should be individualized for each child, based on their baseline and needs. A high-risk child (an overweight child rapidly gaining weight, obese child with a comorbid condition or a severely obese child), should have a follow up appointment preferably in 3 months. These children need more help and need to be monitored more closely for mental health concerns, comorbid conditions, and progress with lifestyle modification. Other children should have at least one follow up appointment in between their yearly checkups. Children who are referred to other resources such as dietician, personal trainer or psychologist should have weekly or biweekly communication so the child and intervention can be checked in on. This also helps create a relationship between the resource and the child, making the child more likely to adhere to the

treatment plan created. As discussed in the previous section, if a child has undergone bariatric surgery, the provider needs to check in on the child frequently. It is proven that the more frequent healthcare visits are, the more likely the child is to adhere to the lifestyle changes and behavior modifications suggested. This is because the child gets more frequent reminders about what a healthy lifestyle looks like, treatments that are not effective can be identified earlier and modified to better fit the individual and progress can be monitored more closely. It is also extremely important to continuously encourage family involvement, since recovery is proven to be more effective if the family helps initiate the change as opposed to health care intervention alone (Nagelberg et al., 2018).

Nursing Role

Nurses are an important resource in the battle against childhood obesity and are important steppingstones that advocate for that child and family, as well as a very skilled medical professional. It is extremely important to create and maintain a trusting relationship with the families involved. The family are those who spend the most time with the child. Nursing staff should be consistent for each child, so they can grow to trust their providers and be honest during visits. The nursing responsibilities include vital signs, height, and weight measurements, draw labs, assess patient and discuss with patients their progress in between physician visits. From this information collected, the nurse will be able to advocate for the patient's needs to the overseeing physician. School nurses are also an important resource in the prevention and treatment of childhood obesity. School nurses can see a child as frequently as they would like and may need, creating a great environment for continuity of care. In school, the nurses can monitor the child's adherence to the treatment plan and assess for complications of obesity more closely than a nurse

outside of the school. Therefore, nurses play a vital role in the treatment of obesity, from assessments to creating a positive relationship with the patient and family.

Limitations

This paper describes the reasons why childhood obesity is an epidemic today and what we can do to help these children. One of the most significant limitations of this project is that the resources were not available to put this treatment plan into action. Instead, the treatment plan pieces together different aspects of tested treatment plans. Future projects should use or consider the treatment plan created and test its effectiveness in a healthcare setting. Another limitation, commonly among most childhood obesity research, is a lack of participant or provider compliance. Without compliance, the treatment plans cannot work or be tested properly. Although, this project did not test the intervention suggested, lack of compliance is a potential limitation in further research. The final limitation of this proposal is the cost of interventions and who will pay for those interventions. The interventions suggested should be paid for by insurance companies. This is because treating childhood obesity can prevent major health complications in the future. Preventing future health complications is cost effective for insurance companies since chronic diseases and hospital time are extremely expensive. Unfortunately, insurance companies may not see that strong intervention is necessary and they may decide that the upfront cost is too high.

Conclusion

It is well known that childhood obesity is a major problem in the United States. Our society is getting more and more obese by the year. This project proposes how obesity can be prevented and treated in childhood. Since overweight children are more likely to become

overweight adults, interventions in childhood should be more effective. Childhood is a time a rapid growth, development, and learning. Some professionals call elementary children (6-12) “sponges” because of how much information they absorb during these years. The addition of healthy living education in these years can help create healthy habits for these future adults. In theory, increased intervention and education of healthy eating and physical activity at a young age would decrease the prevalence of childhood obesity and consequently decrease the prevalence of adult obesity as well. It is well known that prevention is cost effective compared to treatment of most diseases. Therefore, prevention of obesity and treatment of obesity at a younger age will be cost effective when compared to obese adults receiving treatment for a multitude of comorbid conditions.

This project comprises an in-depth treatment plan with rationales for each proposed idea. Obesity is not caused by one factor alone, but many. Therefore, obesity treatment must comprise all causative factors. Obesity can also cause a plethora of coexisting conditions that can be detrimental to a person and a child’s development. These coexisting conditions can be physical or mental. Treatment of obesity must include plans to correct and manage coexisting conditions that arise. It can be seen that this treatment plan comprises many different factors that can be used to treat obesity. Past research was used to collectively to create this treatment plan. Future projects should test out this treatment plan in an outpatient setting to see which parts work and which do not.

It is expected that if this treatment plan is used observable changes in behavior and lifestyle, BMI and/or weight and social wellbeing. Parents and caretakers will be educated on the risk obesity poses to child and have the resources available to them to initiate change. With

consistent and intense treatment, better habits will be formed leading to weight reduction and progress in the fight against obesity.

References

Centers for Disease Control and Prevention. (2018). Childhood Obesity.

<https://www.cdc.gov/obesity/childhood/defining.html>.

Centers for Disease Control and Prevention. (2013). Coordinated Efforts Reversing the Trend of

Childhood Obesity in New York State.

https://www.cdc.gov/publichealthgateway/phpracticestories/stories/PHPSFF_NY_Aug2013.html.

Chen, D., Jaenicke, E. C., & Volpe, R. J. (2019). The Healthfulness of Food-at-Home

Expenditures, the Local Food Environment, and Childhood Obesity. *American Journal of Health Promotion*, 33(3), 412–419. <https://doi-org.brockport.idm.oclc.org/10.1177/0890117118786871>

Chin, J. J., & Ludwig, D. (2014). Increasing Children’s Physical Activity During School Recess

Periods. *American Journal of Public Health*, 104(S2), S208–S213. <https://doi-org.brockport.idm.oclc.org/10.2105/AJPH.2012.301132r>.

Chiasson, M., Scheinmann, R., Hartel, D., McLeod, N., Sekhobo, J., Edmunds, L., & Findley, S.

(2016). Predictors of Obesity in a Cohort of Children Enrolled in WIC as Infants and Retained to 3 Years of Age. *Journal of Community Health*, 41(1), 127–133. <https://doi-org.brockport.idm.oclc.org/10.1007/s10900-015-0077-2>.

Durbin, Jessica, et al. “Pediatric Obesity in Primary Practice: A Review of Literature .” *Pediatric*

Nursing, 2018, www.pediatricnursing.net/issues/18julaug/abstr7.html.

Fang, J., Gong, C., Wan, Y., Xu, Y., Tao, F., & Sun, Y. (2019). Polygenic risk, adherence to a healthy lifestyle, and childhood obesity. *Pediatric Obesity*, *14*(4), N.PAG. <https://doi-org.brockport.idm.oclc.org/10.1111/ijpo.12489>.

Healthy People 2020. (2014). Nutrition, Weight Status, & Physical Activity.

https://www.cdc.gov/nchs/ppt/hp2020/hp2020_NWS-and_HP_progress_review_presentation.pdf.

Nagelberg, N., Yackobovitch, G. M., Wolf Linhard, D., Shalitin, S., Phillip, M., Meyerovitch, J., & Poraz, I. (2018). Intervention for childhood obesity based on parents only or parents and child compared with follow-up alone. *Pediatric Obesity*, *13*(11), 647–655.

<https://doi-org.brockport.idm.oclc.org/10.1111/ijpo.12263>.

New York State Center for School Health. (2019). Physical Education and Physical Activity.

https://www.schoolhealthny.com/cms/lib/NY01832015/Centricity/Domain/98/2019_YR_BS_Physical%20Activity%20Infographic.pdf.

New York State Department of Health. (2020). Obesity Prevention.

<https://www.health.ny.gov/prevention/obesity/>.

Pont, Stephen J. Puhl, Rebecca. Cook, Stephen R. Slusser, Wendelin. (2017). “Stigma Experienced by Children and Adolescents With Obesity.” *American Academy of Pediatrics*. <https://www.pediatrics.aappublications.org/content/140/6/e20173034>.

Pratt, K. J., & Skelton, J. A. (2018). Family Functioning and Childhood Obesity Treatment: A

Family Systems Theory-Informed Approach. *Academic Pediatrics*, 18(6), 620–627.

<https://doi-org.brockport.idm.oclc.org/10.1016/j.acap.2018.04.001>

Roebroek, Y. G. M., Paulus, G. F., van Mil, E. G. A. H., Vreugdenhil, A. C. E., Winkens, B., Nederkoorn, C., Stehouwer, C. D. A., Greve, J. W. M., Bouvy, N. D., & van Heurn, L. W. E. (2019). Bariatric surgery in adolescents: a prospective randomized controlled trial comparing laparoscopic gastric banding to combined lifestyle interventions in adolescents with severe obesity (BASIC trial). *BMC Pediatrics*, 19(1), 1–10. <https://doi-org.brockport.idm.oclc.org/10.1186/s12887-019-1395-9>.

Stanford. (2017). *Obesity Labs*. [online] Available at:

<http://med.stanford.edu/content/dam/sm/ppc/documents/Nutrition/OBESITY_LABS_8-14-17.pdf> [Accessed 19 January 2021].

Stratton, Danielle, R. (2021). Development and Implementation of a Childhood Obesity Protocol in a Pediatric Primary Care Practice. *Archives of Healthcare*, 1(3), 100-107.

University of California San Francisco. (2020). Obesity Causes.

<https://www.ucsfbenioffchildrens.org/conditions/obesity/causes.html>.

Williams, L., 2018. *The Social Effects Of Childhood Obesity*. [online] Healthfully. Available at:

<<https://healthfully.com/causes-effects-of-child-abuse-5723724.html>> [Accessed 28 December 2018].

