**Pediatric Community Health Promotion Program**

**Background**

The purpose of this health promotion program is to provide a feasible outlet for children with disabilities to manage weight and associated poor health outcomes while educating the child and family with evidence based interventions.

*Outcomes*

The focus of the health promotion program will be obesity and well-being. Obesity has multiple effects on a child’s life and this program hopes to address or provide resources for all factors.1 The program will use three outcome measure to assess changes in body mass index (BMI), cardiorespiratory fitness, and health-related quality of life (QOL). These outcome measures will allow for a review of how the child’s obesity is affecting their life.

BMI is a simple, inexpensive, and noninvasive measure to track body weight in relation to height, age, and sex, taken by dividing weight in kilograms by height in meters squared (kg/m2).2  BMI measures excess weight rather than excess fat and therefore may have limitations but studies support its correlation to body fat similar to that of underwater weighing and dual energy x-ray absorptiometry.2 Some factors cause limitations in BMI calculation and body fat for children, including race/ethnicity, muscle mass, and sexual maturation.2 Since children go through major growth changes, BMI is interpreted through BMI charts related to age and sex for children.2 These values are classified into percentiles to determine underweight, healthy weight, overweight, and obese.2 BMI level is associated with body fat levels and future health risk, with a higher BMI correlating with future morbidity and death.2 Considering the limitations of the BMI it should not be used as a diagnostic tool but is appropriate for the purpose of the program as a tool to track weight and as a screening tool for weight related problems.2 When evaluating excess body fat in children with disabilities there may be different evaluative tools, however, studies have shown CDC BMI growth chart is a better tool than disease specific BMI.3 BMI was the preferred evaluation tool for multiple weight management programs that this program was based on.5-8 BMI is a simple and appropriate tool for all children who participate no matter their ability, that can be taught to children and their families to continue tracking of excess body weight.2

To evaluate cardiorespiratory fitness level a progressive shuttle run test (SRT) will be used.9 One systematic review found the SRT as the most appropriate tool for evaluating cardiorespiratory fitness in young children due to representing the strongest validity when compared to other cardiorespiratory fitness measures.10 The SRT was found to be valid when adapted for children with different abilities.11 Verschuren et al, found the SRT could be a reliable tool to assess cardiorespiratory fitness in children with cerebral palsy Gross Motor Function Classification System Level III.11 Another study found that obese children perform lower on the SRT and the test should only be performed once due to best outcomes.12 With consideration of the above information, the children will participate in the SRT individually, if possible to allow for adaptations for ability and to decrease self-comparison to other children. The SRT is simple, free, and can be modified to fit any child while reliability evaluating cardiorespiratory fitness.

Obesity can have an impact on a child’s QOL and therefore the program will evaluate changes and provide mental health referrals when needed.13 Children who are overweight are more likely to face multiple psychosocial problems when compared to healthy weight peers.13 Many of these negative experiences are related to stigma about overweight children and teasing/bully related to the child’s weight.13 The PedsQL is a tool that measures pediatric health-related QOL.14 The PedsQL is short with 23 items taking about 4 minutes to complete and is appropriate for multiple setting including school and community.14 The PedsQL looks at physical, emotional, social, and school functioning categories.14 The tool has high psychometric properties including reliability of 0.88 for child self report and 0.90 for parent report.15 When evaluated for children with Intellectual and Developmental Disabilities (IDD), the reliability and validity continued to stay high.16 Although, mental health providers will not be a part of the program, the program will provide support, resources, and referrals for mental health.

*Interventions*

The program will consist of two major interventions, an exercise program and a nutritional and wellbeing educational program. The exercise component will consist of month long sports related activities with specific education and skills. This system will teach sports skills that will encourage integration into sports to continue healthy habits in the future. Collins et al, evaluated a sports specific program for children age 7-12 who had IDD that found significant increases in muscular strength and endurance following one 90-minute session a week for 10 weeks.17 Seron et al, evaluated a 12 week program for children age 12-18 with DS that concluded aerobic interventions at an intensity of 50-70% of heart rate reserve three times a week could significantly decrease BMI.6 Although there are studies that focused on specific strength or aerobic exercises, Watson et al found that children are more likely to be engaged when participating in interactive and varied activities they find fun.18 Therefore, this program will focus on optimizing fun, sports, and active education rather than didactic or heavy information.18 In general, participation in physical activity and sports programs promotes physical, emotional, and social well-being in all children, including those with disabilities.19 Following the above studies this program will incorporate the follow factors. The program will be sports related with a goal of staying in 50-70% of heart rate reserve intense aerobic activity that is fun and engaging.6, 17-19 The program will be one time a week for 90 minutes, for one semester.6, 17-19

The educational component of the program will be held later in the afternoon after the exercise component to ensure family participation. This requirement will be beneficial for building a sense of community through family interaction and participation in behavioral changes.22 Sothern et al, evaluated the effectiveness of a yearlong program that included short, interactive parent educational sessions.5 The program included discussion, modeling, role play, guided problem solving, self-monitoring, and setting limits along with cooking demonstrations with the families.5 This program found a reduction of BMI by ~2.65 in children age 13 to 17.5  Following an evaluation of parents perspective on a weight management program for children with IDD, Ptomey et al, found parents preferred a program that allows weight loss but does not require significant amount of time or burden on the family and parents that model good healthy habits resulted in a decrease risk of the child’s obesity.20 When providing education on nutrition Hinckson et al, suggest including picture-supported guides, color coding, practicing measuring food portions, and tasting and rating healthy snacks to know preference.21 Following the above articles, the program will have set educational session, including pre-established lesson plans with a meal, followed by a short interactive parent only education session. The mix of child, whole family, and parent education allows for multilevel promotion of health behavior changes.

To ensure behavioral change the program will target multiple levels of the SEM.22 To address individual determinants the program will allow the children to help decide what sports they want to learn and empower the child to assist with decisions about their own health and fitness.22 Each child will help create their own goals, focused on abilities and behaviors rather than weight.22 Allowing the child the opportunity to be a part of their own health plan is likely to show more motivation to achieve the goals.22 Children will also be motivated through positive reinforcements for good behavioral changes, which was found to be effective by Sothern et al.5 Since the children are dependent on their families, the program is address the interpersonal component by requiring family participation which allows for increase participation.22 To address limited participation in programs, this program provides safe child care followed by a meal during family required time to ease family burden of meal prep.22 A school based location, allows for integration and relationships with school staff and community.22 Requiring families to attend the session allows for a chance for families to interact and build a community. The program will also have integration of typically developing children to allow for opportunities for relationships and acceptance.22

The health program will battle childhood obesity in children with disabilities through exercise and educational programs for the child and their family that will target multiple levels of the child’s well-being and environment to allow for the best chance for positive lifestyle behavioral changes that are supported by evidence.

**Program Goals**

To ensure success of improvement of health status for children and their families in the program the program will have the following goals:

1. *SMART GOAL #1 (Body Weight*): By the end of the program, more than 80% of the children will present with trends toward a BMI of healthy range.3,4
2. *SMART GOAL #2 (Cardiovascular Fitness):* By the end of the program, all children, on average, will improve by greater than 1.32 shuttles to represent improvements in cardiorespiratory fitness greater than the minimal detectable change.11
3. *SMART GOAL #3 (QOL):* By the end of the program, all children who score below or equal to 50 in two or more categories on the PEDQL will be referred to appropriate mental health professional.14-16
4. SMART GOAL# 4 (Family Education): By the end of the program, family reported evaluation will show an increase in number of familial activities and improvements in diet.
5. *SMART GOAL #5 (Program Evaluation/Satisfaction):* At final evaluation, more than 75% of participants will score the program as “would recommend” and/or “would attend again”.

**Methods**

The program will target overweight or obese middle school aged children at a local middle school. The program will target overweight or obese children from that specific school but will accept children from the feeder elementary school, for fifth graders, and feeder high school, for ninth graders, if unable to achieve desired amount of participants from the middle school. The desired amount of participants is 15-20 children. The program is open to overweight or obese children of all physical and cognitive abilities with a priority given to children with physical and/or cognitive disabilities but inclusive of typically developing children. The program is more suitable for children who are able to cognitively participate in activities but no exclusions will be made on cognitive or physical abilities. Children with assistive devices and other motor impairments will be accommodated. Strategies will be in place for children with cognitive disabilities including quiet rooms and times. Children will be targeted through schools listserv, flyers at the school, announcements sent to teachers and parents, and invitations from school based therapist. Advertising and recruitment will occur during the fall semester for a spring-based program. Spring program will be favored over fall to encourage healthy habits over summer break.

The program will be staff by at least six members, including at least one physical therapist (PT), one occupational therapist (OT), and one nutritionist. The rest of the staff will be college volunteers that will be required to attend consistently for the whole semester with a preference of college students interested in either PT, OT, or nutrition. Six staff members will be inclusive of the 1:3 coach ratio recommended by Collins and Staples 2017.17 The program will require access to the gym, an outdoor space, and one classroom. If a kitchen area is available, that room will be required as well, however strategies will be in place for cooking demonstrations without a kitchen. Staff will require sports equipment and cooking supplies. Due to the dinner component of the program a fee for the program will be in place. Fee will be based on specific program and location, with potential for financial assistance for families in need.

The program will be a semester long program, approximately 17 weeks, once a week for two and a half hours. The first 90 minutes will be the physical activity component of the program that will be for the children only. This portion of the program will be followed by a 45 minutes dinner and family food lesson with a 15-minute parent only education session. The first, eighth, and last week of the program will be dedicated to individual evaluation scheduled at varied times throughout the week that work best for the child and family. Therefore, there will be approximately 14 program sessions throughout the semester. During the physical activity component of the program, the children will participate in lessons on five different sports with approximately three sessions per sport. Sports will likely consist of baseball/softball, soccer, basketball, football, and dance but children will be able to provide feedback about chosen sports. Food demonstrations and lesson will be led by the nutrionist with support from the other staff members. The lesson will consist of education on meal preparation for the specific meal for the week that will be easy for family to replicate at home. Most lesson will include active participation in meal preparation of all family members who attend. This opportunity allows family members to learn for home replication and include their child in food preparation process. Parent only education sessions will be short and interactive. The education sessions will allow for parents to build relationships with other families in the group. Sessions topics will be outlined as follows in Table 1, but will allow for parent feedback on topics. To allow for full family participation and attention, children will be watched in a separate room by the college-aged staff while the professionals host the parent education sessions.

|  |  |
| --- | --- |
| **TABLE 1: Parent Education Topics** | |
| **Week** | **Topic** |
| 1 | Intro/Basics (Goal setting and self-monitoring) |
| 2 | Food Groups |
| 3 | Safety and Exercise |
| 4 | Food labels |
| 5 | Walking and running |
| 6 | Grocery Shopping |
| 7 | Strengthening |
| 8 | Dining out |
| 9 | Flexibility/stretching |
| 10 | Beverages |
| 11 | Sports |
| 12 | School meals |
| 13 | Family and community exercise |
| 14 | Snacks |

**Evaluation**

The program will include three evaluative weeks, the first week, 8th week, and the final week. These weeks will not have the weekly session but will allow for individual scheduled sessions with the family. The evaluations include participant and family evaluation and program evaluation. The participant and family evaluation will include completion of the three outcome measures, family evaluation, and individual discussion. The outcome measures, BMI, Shuttle Run Test, and PedsQL, will be completed individually following methods stated above in the background. Following these assessments, the child and family will complete an interview-based evaluation. This evaluation will be led by a program staff member based on questions in the appendix**.** Following the evaluation, the family will have an opportunity to ask specific questions and receive resources the family expresses interest in or are presented as a need.

Once participant and family evaluation are completed, the program staff will compile the data and will meet for participant and program evaluation. Program evaluation will be based on CDC’s Framework for Program Evaluation in Public Health.23 During evaluation, program staff will invite a parent representative to ensure inclusion of all stakeholders, as well as any school official that may be involved with the program. Description of program will be made available and revised as needed to ensure achievement of goals and based on program specifics. Evaluation design will be determined depending on year and stakeholders opinions but will include discussion of implementation, effectiveness, efficiency, cost-effectiveness, and attribution.23 Implementation evaluation will assess if the program including all activities and lesson plans were executed as planned. If not, discussion will focus on why and if these changes will continue. Evaluation of effectiveness will entail evaluation of collected data and determination if the data is representing a trend toward the programs goals.23 Discussion will follow to determine what is working well and what needs to change to ensure the program is address the goals. Efficiency evaluation will be based on staff evaluation of workload and use of resources compared to outcomes.23 Cost-effectiveness will evaluation cost of meals, location, equipment, and staff burden. This will be especially important in the first year due to startup cost and expected future participation to understand the feasibility of long-term success. Due to inclusion of meals, the program will require a fee to run. Evaluation will include research for funding to limit cost for families. This evaluation will also include looking at the fee end evaluating appropriateness. Attribution evaluation will discussion chance of changes toward goals coming from sources other than the program. This evaluation will be important to apply to all other aspects of continuation of the program. The conclusion of the evaluation will include justification of findings and a plan for utilization of evaluation findings.23

**Conclusion**

This program will allow an opportunity to combat the United States obesity epidemic specifically targeting children with larger barriers toward this epidemic. With a 38% increase in obesity of children with disabilities compared to typically developing children, this program is extremely important.24, 25 Obesity leads to increase risk of chronic diseases that children with disabilities may already be at high risk for.24, 25 This risk increasing the chance of chronic disease for children with disabilities.24,25  The need for programs like this one are extremely important for this population due to the barriers children with disabilities face that increase their risk of obesity.24,25 Creating a program that allows for opportunities for children to participate in physical activities as well as educate on physical activity and diet for the whole family may be able to decrease the chance of poorer health outcomes in this population This program utilizes the social ecological model to implement behavioral changes in multiple aspects of the targeted individual’s life for greater chance of positive long-term change. The hopes of this program are to build a foundation for long-term overall wellness by addressing all areas of obesity. With consistent lifestyle changes, influenced by the program, the children have an opportunity to decrease the burden of limitations associated with their disabilities.

This program, if well received and effective, can be implemented at multiple schools all over the country. The program is general enough to be implemented in different setting, regardless of location, but consistent enough to determine effectiveness for future use. The plan behind the program is based on evidence for influencing change in obesity in children with and without disabilities.

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**Appendix**

**Semi-Structured Interview Guide**

1. On a scale of 0-10 how would you rate your **experience with the program**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| O(complete dissatisfaction) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (could not be more satisfied) |
|  |  |  |  |  |  |  |  |  |  |

* 1. What did you like the most/least about the program?
  2. Did you interact with other families; if so tell me about this experience?
  3. Do you feel this program was worth your time/money?
  4. Would you return or recommend this program?
  5. What else can you tell me about your experience with the program?
  6. How can we improve this program?

1. How likely are you to implement things you learned during the family/parent education sessions?

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (Not at all | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very much so) |
|  |  |  |  |  |  |  |  |  |  |

* 1. What are things you think are limiting or encouraging this number?
  2. Do you believe this program is making a difference in your child’s health?

1. On a scale of 0-10 how would you rate your child’s **physical activity?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. How has this changed over time?
  2. What are things you think are limiting or encouraging this number?

1. On a scale of 0-10 how would you rate your family’s **physical activity?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. Do you believe this effect your child’s physical activity?
  2. What are things you think are limiting or encouraging this number?

1. On a scale of 0-10 how would you rate your child’s **diet and nutrition?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. How has this changed over time?
  2. What are things you think are limiting or encouraging this number?

1. On a scale of 0-10 how would you rate your family’s **diet and nutrition?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. Do you believe this effect your child?
  2. What are things you think are limiting or encouraging this number?

1. On a scale of 0-10 how would you rate your child’s **overall health?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. How has this changed over time?
  2. What are things you think are limiting or encouraging this number?

1. On a scale of 0-10 how would you rate your family’s **overall health?**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 0 (poor) | 1 | 2 | 4 | 5 | 6 | 7 | 8 | 9 | 10 (very good) |
|  |  |  |  |  |  |  |  |  |  |

* 1. Do you believe this effect your child?
  2. What are things you think are limiting or encouraging this number?