Educating children ages 6-13 on nutrition and the importance of physical activity to reduce childhood obesity rates in school districts of Queens, New York

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Burden in terms of disease, costs, quality of life

- Childhood and adolescent obesity are closely linked to diabetes, cancer, and cardiometabolic outcomes in midlife.
- A recent longitudinal study analyzing adolescent BMI and incidence of type 2 diabetes, revealed Adolescent obesity serves as a significant predictor of mortality related to type 2 diabetes in midlife, exhibiting a hazard ratio that is 20 times higher compared to adolescents with a normal BMI (Twig, 2021).
- A meta-analysis done quantitatively across 48 studies evaluated the worldwide economic burden of childhood obesity in comparison to those with healthy weight. Results indicated increased annual total medical costs were $237.55 per capita, attributed to childhood obesity. (Ling, et al. 2023).
- Prescription medication costs were also evaluated and there was noted to be an increase of $46.38 per capita for children overweight or obese (Ling, et al. 2023).
- In terms of quality of life children with obesity experience numerous psycho-social problems that significantly affect their quality of life and wellbeing.

Is childhood obesity an increasing or emerging burden?

- In recent decades, the prevalence of obesity in children has increased dramatically. As of 2020, about 19% of children in America are considered obese, equating to about 14.7 million children. As one in 5 kids are now considered obese, we can say it is a rapidly increasing burden that affects the nation in multiple ways.
- Recently in a study completed in 2020 it was noted that obese teenagers have a 90% chance of remaining obese or overweight at the by the age of 35. Of these, about 80% of these adults will develop CAD additionally (Bashir, 2020).
- In a study done in 2022, almost one out of ten children with obesity were found with depression. Compared with normal-weight children, children with obesity were 32% more likely to have depression(Kanellopoulou,2022)

Evidence on the importance for a community or organization to present childhood obesity rates

Health Outcomes:

- In a cross-sectional retrospective US cohort, children with severe obesity and mild obesity had an odds ratio of 4 and 2 for hypertension, respectively, compared to children with normal weight. (Bendor, et al. 2020).

Prevalence:

- According to the CDC, approximately 39% of New York City Public School children in kindergarten through eighth grade are overweight or obese, compared to 35.5% of children aged 6-11 nationally. If childhood obesity is not addressed, the rates will continue to increase and persist.

Educational Performance:

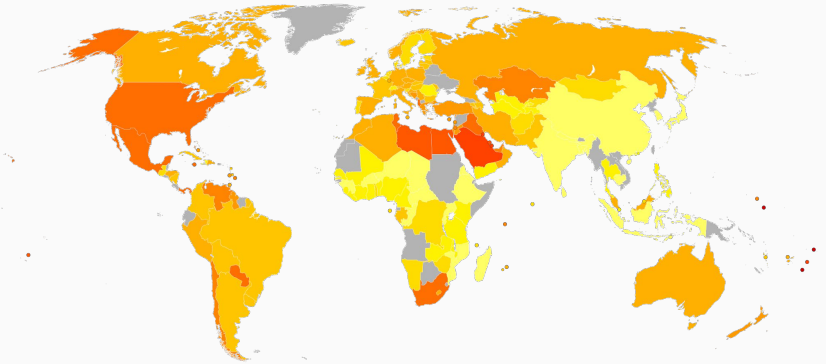
- Data from a 2011-2012 National Survey of Children's Health indicated that obese children were significantly more likely to have school absences and school problems, to repeat a grade, and to have lower school engagement than non-overweight children. (Carey, et al. 2015).

Economic Impact:

- According to the Bureau of Chronic Disease Evaluation and Research of New York State Department of Health, obesity results in approximately $173 billion dollars in national health care expenses each year.

Obesity is Becoming a Worldwide Issue

- BMI equal to or greater than 30.
- Worldwide obesity has tripled since 1975 (World Health Organization, 2021).
- Chronic illnesses such as DM, HTN, Stroke, Cancer, and CAD are associated with obesity, in turn, is responsible for more deaths globally as compared to underweight illnesses.
- Globally, 1.9 billion adults 18 or older are considered overweight, with approximately 650 million of these people considered obese (World Health Organization, 2021).
- Considered a preventable condition.

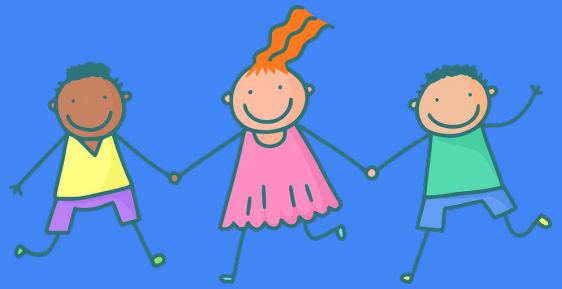


Childhood Obesity is Becoming a Huge Concern

- As per the WHO, an estimated 38.2 million children 5 years or younger are reported to be obese (World Health Organization, 2021).
- Childhood obesity has risen from just 4% in 1975 to 18% in 2016, worldwide (World Health Organization, 2021).
- Once believed to be a higher-income nation issue, childhood obesity has been on the rise in lower-socioeconomic settings, in particularly urban cities.
- Children who are overweight and obese tend to face similar issues well into adulthood due to the development of disabilities such as respiratory issues, HTN, insulin resistance, and an increased risk for fractures.
- Factors such as lower education level, lower household income, poor family function, and high levels of stress all have shown strong associations with increased risk for obesity (Livingston, 2021).

What Exposes Children and Adolescents to Obesity in Queens?

- Several prior cross-sectional studies have discovered associations between the food environment in school neighborhoods and the weight status of adolescents, demonstrating varying degrees of correlation (Jia, et al. 2019)
- In other words, poor food selections such as convenience stores and fast food restaurants near schools have shown associations with an increased rate of obesity levels.
- Studies comparing physical activity in children in rural areas vs urban cities found that children in urban settings were the least physically active, particularly during recess (Jones-Matre, et al. 2008).
- Findings indicate that preschoolers are meeting only 74% of the recommended physical activity guidelines, while exceeding the recommended screen time by 33% starting from the age of 2 (Kunaratnam, et al. 2023).



Implications

- At age 5, BMI has shown to be the best variable to predict childhood obesity (Kunaratnam, et al. 2023).
- Children who were found to be obese at age 2 typically remained obese at age 5.
- Intervening early has been shown to prevent progression of obesity throughout later years.
- Cross-sectional studies have shown that improving dietary knowledge among school-children reduces obesity rates (Wang, et al. 2022).

Relevant Findings from Previous Research in Preventing Childhood Obesity

- Based on the Meta analysis and our Research on Previous studies, there is
- **Strong evidence** that physical activity prevent child obesity in either
  - ❏ Interventions delivered in schools with home involvement or
  - ❏ Combined diet–physical activity interventions delivered in schools with both home and community components.
- **Moderate Evidence** for school-based interventions targeting either diet or physical activity alone, combined interventions delivered in schools with home or community components or combined interventions delivered in the community with a school component.
- **Low Evidence** for combined interventions in childcare or home settings.

Relevant Findings

- The Physical Activity of about 90 min/wk of moderate to vigorous intensity delivered by classroom teachers, **promote daily Physical activity and academic achievement** in elementary school children. Additionally, 75 min of Physical Activity Across the Curriculum activities may **attenuate increases in Body Mass Index(**Donnelly et al 2009).
- Another study showed that regular physical activity by means of daily school exercise lessons has a significant positive effect on physical fitness. Furthermore, there is a positive trend in **reduction of BMI** and **increase motor ability** improvement.(Walther at al 2009).
- A school-based intervention of diet and physical exercise tailored for adolescent girls(12-14) from schools located in low-income communities **reduced BMI gain** (Lubans et al 2012).

Implementation Plan

- Hold after school workshops to educate children about the importance of physical activities and nutrition.
- Hold workshops for teachers and school administrators.
- Send school children home with brochures outlining important information shared at the workshops for families to review at home.

So, how do we encourage a healthier lifestyle for children living in School District of Queens?

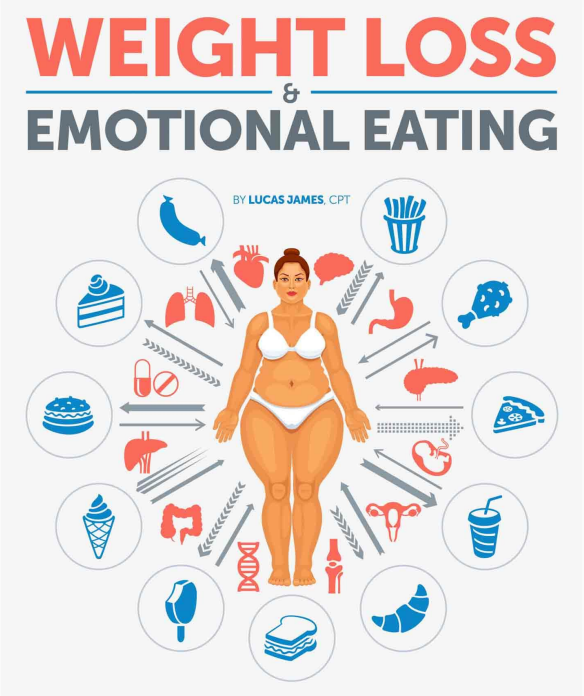
- 1. Encourage a **varied and balanced diet** by emphasizing the consumption of breakfast, the consumption of fruits and vegetables, the limitation of "snack" products and sugary drinks.
- 2. Develop a **personalized behavioral approach**, aimed at reducing overall energy intake such as self-monitoring, stimulus control, and goal setting.
- 3.**Advice that are adapted to the child age** and involving the family circle.
- 4. Educate children on different forms of **physical exercise** and the importance of incorporating it into their daily lives.

What is Psychological Aspect of Eating Behavior in our Intervention?

5.**Support and strengthen parents in their educational role**: avoid reward/comfort foods, know how to say “no”, adopt an educational style that fits: neither too permissive, nor too authoritarian, nor negligent.

6.**Ensure that the behavior of the parents, the rest of the family is consistent with the target BMI**

7.**Preserve the child from any form of stigmatization**. The child or adolescent must not find themselves sidelined (different menu, forced to eat more fruit and vegetables, etc.). If harmonization within the family is not effective, the child or adolescent may find themselves in a difficult situation.



Implementation - Stakeholders

Who will pay for it?

- **Government agencies**
  - Dept of Health - responsible for enforcing health policies and providing resources/guidelines.
  - Dept of Education
- **Academic & research institutions**
- **Community organizations**
  - Non-profit organizations

Who will carry it out?

- **Schools**
  - Responsible for implementation of education program promoting physical activity and healthy meals.
- **Parents and families**
  - Responsible for reinforcing physical activity and diet habits at home.

When will the intervention be implemented or how long will it be maintained?

- The workshops would be implemented after school as another form of extracurricular activity that parents would be able to enroll their kids into.
- Workshops would be an hour long, once a week, following the regular school schedule.
- Minimum of two years is needed to evaluate the proper impact of the program.

Measurements that Will Show if The Interventions were Successful

- Before and after Body Mass Indexes (Early in the school year vs late into the school year)
- Hip and waist circumference measurements
- Feedback from parents:
  - Assessing screen time activity
  - Time physically active
  - Improvements in cognitive function
  - In-school behavior and performance
  - Lifestyle and diet modifications
  - Mood and affect
- 2 - 3 year follow up

Data Collection Methods

- **Surveys**
  - To assess for BMI
- **Questionnaires**
  - To gather feedback from parents
  - Beck Depression Inventory: self-reported questionnaire to evaluate severity of depression
- **Interviews**
  - Assessing children's wellbeing and overall health after attending the workshop during the end of the school year

Resources

Available:

School Wellness Council

- Implemented in all NYC Public Schools to ensure that schools provide physical & health education and offer physical activity clubs and events. They can provide resources and staff to support the workshops

Federal grants from agencies

- Centers for Disease Control and Prevention (CDC) and the U.S. Department of Agriculture (USDA) periodically provide funding opportunities to combat childhood obesity

Needed:

Collaboration With Schools

- Partnering with schools in the District of Queens will allow us to access the target audience of children ages 6-13

Additional Funding

- Additional resources are necessary to cover the costs for organizing and conducting the workshops

Staff:

- Hiring a nutritionist or dietician to address questions, develop workshop content, and lead discussions.
- Overall, include various staff members including a health educator and program coordinator to effectively educate students and teachers

Who Should Know About This?

- Parents
  - Single parents
  - Low SES
  - Parents from a low educational background
- Overweight or obese adolescence
- Social Workers
- Educators
- Community leaders

Possible Barriers/Limitations

- **Limited resources**
  - School budgets are already struggling to meet the needs of school staff. Lack of necessary funding would hinder the implementation of comprehensive interventions.
- **Lack of participation**
  - Parents may be hesitant to enroll their children into after school programs due to personal reasons (time conflicts, transportation, and other after school activities).
- **Cultural/language barriers**
  - Families may struggle to adopt the suggestions from workshops and incorporate them into their household diets due to the challenge of aligning the healthy diet plan with their cultural food traditions.

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