

# ACCESS TO PHYSICAL EDUCATION IN HIGH SCHOOLS AND CHILDHOOD OBESITY

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*ABSTRACT: Childhood obesity is a major public health issue that affects adolescents all over the United States. Studies show that Americans' average weight has increased since 1970s; for ages 2 to 5 obesity has doubled and nearly tripled among youth ages 6 to 19. According to the information collected by Interlake High School representatives, it appears that IHS more than fulfills students' physical education needs because they have a robust physical education implementation program and that all high schools should provide to their students. Random sampling will be used to study Interlake High School students with a wide range of ethnicities. This research proposal will include analyzing data from the Healthy Youth Survey and the Bellevue School District. In this research proposal, the research question is: Is there a relationship between the access of physical education in high schools and childhood obesity, specifically for grades 9-12?*

## Introduction

Obesity is a major public health issue in adulthood and childhood. Obesity is measured by Body Mass Index (BMI), which is calculated based on a person's height and weight; a BMI of 30 or over is categorized as obese (Public Health England, 2015). Americans' average weight has increased since the 1970s and prevalence of childhood obesity has more than doubled among children ages 2 to 5 and nearly tripled among youth ages 6 to 19 (National Institutes of Health, 2013). There are many factors that lead to obesity such as easier access to unhealthy food and an inactive lifestyle with little or no physical activity (LifeSpan, 2013). However, the lack of physical education in schools contributes twice as much as the previous factors to childhood obesity (National Institute of Health, 2013). Physical education helps people be more physically and mentally active, be medically healthy, gain self-confidence, do better in schools, and be more sociable (PHIT America, n.d.). The access of physical education in high schools provides many benefits to children, including helping them maintain a healthy body weight and be able to better stay focused. From the research I have done I found that Interlake

High School is a great example of a good physical education model which promotes higher academic performance, an active lifestyle, and lower obesity rates.

Studies show that King County has a moderate percentage of obesity in high school students compared to other counties in Washington State (Healthy Youth Survey, 2012). Healthy Youth Survey (HYS) is a statewide survey that measures the health threats that lead to death, disease and public issues among adolescents in Washington State. According to the HYS data of 2010 and 2012 for grades 8, 10, and 12 show that King County had the same percentages (8%) of obesity in high school students as Seattle (8%), but relatively lower percentages than Washington State (10%) high school students. Other data from Interlake High School shows that the percentage of high schools with more than 60 minutes of physical activities per day for King County was the same as for Seattle high schools (23%), whereas Washington State had a higher percentage of physical activities in high schools (26%). In 2013, the Healthy Youth Survey shows that the King County obesity rate has increased by age, including a 10% increase for 18-24 year olds, 21% for ages 25-44, 27% for ages 45-64, and 22% for ages 65+. How-

ever, according to The Seattle Medium Newspaper (2015), in 2014, Public Health and King County school districts worked together to reduce obesity in youth by 17%. This was done by applying an obesity prevention initiative that increased healthy practices among middle and high school students. The aim was to provide communities with healthier food choices, access to public parks, recreational trails, create more sidewalks, limit the marketing of fast food and increase access to physical education in schools (The Seattle Medium Newspaper, 2015).

While there is a lot of research about the presence of physical education in high schools, there should be more research about how each high school can have a successful implementation of physical education. For example, Interlake High School (IHS) in Bellevue is of particular interest because of its physical education implementation. Its enrollment is very large, 1503 students as of the 2014-2015 year, for grades 9-12 (Interlake, 2015). Data will be provided regarding obesity rates and presence of physical education (PE) in Interlake High School later in this paper. In this research proposal, the research question is: Is there a relationship between the access of physical education in high schools and childhood obesity, specifically for grades 9-12? The hypothesis is that high schools that lack physical education are more likely to have higher rates of obesity.

### **Background**

Providing requirements for physical education in high schools helps reduce the prevalence of childhood obesity. According to the PE department representatives, Melissa Leibole and Christina Madden, IHS provides a lot of outdoor facilities for its students such as a grass football field, baseball and softball fields, seven tennis courts, and three indoor gyms. (Interlake, 2015). These representatives mentioned that ninth graders are required to do approximately 22 hours of PE per month. In addition, 10-12 graders can take PE electives, such as weight

training, personal fitness, racquet sports, and basketball. Furthermore, data was provided about the obesity rates of 9-12 graders at IHS from the Healthy Youth Survey. In 2014, the obesity rate of children in grades 9-10 was 5%, compared to the statewide student rate at 11%. And students in grades 11-12 had a rate of 9% compared to the statewide student obesity rate of 11%. As a result, this data demonstrates that students at IHS are positively affected by physical education. This is a move in a positive direction. If more physical education is implemented in schools, the students will be more active, will have a higher academic performance, and have lower rates of obesity.

More PE in schools leads to decreased obesity rates and higher academic performance. Tonetti, Fabbri, Filardi, Martoni, and Natale (2015) explain the association between overweight students and poor academic performance in high school. This study intended to determine whether sleep quality, sleep duration, socio-economic status or BMI affected students' grades. In this study, thirty-seven high school students from the United States participated; their BMI was measured as well as their quality and duration of sleep by using actigraphic recordings. School performance was measured based on the grade of the final exam that students took. A higher grade meant higher school performance. The results showed that BMI was the only negative predictor of grades. Obesity and poor academic performance are related because obese children are more likely to have a sedentary lifestyle while watching television, among other factors (Harvard T.H.Chan, n.d.). Tonetti et al., continue that when children performed poorly on the final exam, there might be other factors that would affect performance such as family income, race, sex, parents' education level, and job status. IHS was ranked the fifth school in the state based on SAT scores for 2010-2012, which it may have been affected by high investment in physical education (Sung, 2015).

If healthier food choices are provided in schools, students will be more active, will be

healthier, and have lower rates of obesity. Story, Nannery, and Schwartz (2009) explained that there is access to unhealthy foods in schools such as vending machines, local stores, and school lunch programs. This study examined the presence of foods, snacks, drinks that contain high amounts of sugar and fat, and the duration of physical education in all high schools in the United States. The results show that in all high schools, the availability of unhealthy foods, snacks, and drinks that contain high amounts of fats, sugars, and energy is higher than the availability of fruits and vegetables. Moreover, Story et al. (2009) suggest that in most schools there is not enough time for physical education, and little access to high-nutrient foods and healthy drinks. Also, since there is easy access to energy drinks, drinking water is neglected. Although there is a lot of unhealthy food consumption, the presence of physical education and activities in schools are able to balance the issue of obesity.

Research demonstrates providing requirements for physical education in all high schools helps to reduce the prevalence of childhood obesity. Kahan and McKenzie (2015) note that the quality of physical education programs in schools helps students develop their skills, concepts, and dispositions needed to be physically active for life. Additionally, in order for physical education to increase, students' energy expenditure in physical education class needs to be longer in duration. Other factors that may lead to obesity include unhealthy foods in schools, their parents' low income, poor neighborhoods, and the school's location. Leibole (2015) suggests that sufficient and regular physical activities not only help prevent major diseases, but also promote learning, reduce stress, depression, and improve overall wellness. Interlake's rate of obesity is lower than statewide high schools because they have a robust physical education implementation program (Leibole, 2015).

According to the information collected by IHS representatives, it appears that IHS more than fulfills students' best interests and this is what all high schools should provide to their students.

Looking at the relationship between physical education in high schools and obesity, it can be concluded that students at IHS are positively affected by physical education. On the other hand, high schools that lack yearly physical education requirements for students are more likely to be negatively affected by obesity. Also, increased availability of fruits, vegetables, whole grains, and low-fat dairy products as components of school meals may be an effective strategy to promote healthy eating behaviors among children.

## Methods

### Study Design

This research proposal will include analyzing data from the Healthy Youth Survey and the Bellevue School District.

### Population

The target population is students enrolled in the Interlake High School, Bellevue. The study sample is 100 students, grades 9-12, ages 14 to 18.

### Sampling Method

Random sampling will be used to study Interlake High School students with a wide range of ethnicities. The sampling process will include reviewing pre-existing data from the Healthy Youth Survey, asking students questions such as listing the types of food they eat every day in school, how often they eat, and whether they eat school lunch or bring their own lunch. Also, data will be retrieved regarding obesity rates from the school.

### Ethical Considerations

Student participation in the study is anonymous and voluntary; there will be no harm to participants. There will be an assent form for children who are under 18 and a consent form for students' parents/ guardians. Additionally, an IRB review from the school district will be obtained.

## Instruments

The most important independent variables in this study are diet and access to physical education. Diet will be measured by observing how often students eat and the type of food each student consumes during lunch time each day. Also, it will be observed whether students consume school lunch or bring their own lunch to school. The amount of physical education will be measured by observing how often students do physical activities in school and how often students visit gyms and parks. PE teachers will be asked how many students they have data for on required PE classes. The most important dependent variable in this study is BMI. The increase in BMI will be measured by getting the weight and height of each student in order to get the BMI; students with BMI over 30 will be considered as obese. The access to healthy foods will be measured by observing the quality of food in neighborhoods and asking about parents' income levels. Another important dependent variable is childhood obesity, which will be measured by asking each student their weight and height, and getting their BMI.

## Procedures

Data will be collected by reviewing existing records from the Healthy Youth Survey along with a questionnaire asking students the type of foods they eat, how often they eat during the day, how often they eat vegetables, how often they have PE, and visit trails and parks. Data will be also collected by observing students from the beginning to the end of their lunch time. The timeline for this study is as follows:

- January to March 2016: Obtain IRB, conduct literature review, examine Healthy Youth Survey, prepare assent & consent forms, and survey questions.
- March to April: Observe and collect data from Interlake High School students.
- April to May: Results, analysis, write-up & disseminate data.

Dissemination: Write-up results around April 2016 and complete the poster by May 2017.

## Analysis

This study will use a quantitative analysis method because there will be questionnaires used to gather information from multiple participants on their eating habits and physical activities. The questionnaires seek to ask questions such as whether students ate vegetables last week, chicken and rice, burger and fries, macaroni & cheese, number of servings of fruits or vegetables per day, etc.

Also, students' height and weight will be asked to calculate their BMI, which will be compared with the school district's data using the following formula:  $\text{weight (lb)} / \text{height (in)} \times \text{height (in)} \times 703$  (BMI Formula, 2015).

## Discussion

### Significance & Implications

Maintaining a healthy weight is not always easy. Obesity as a major public health concern takes its toll on human life and requires research, education, implementation of cures, ameliorating care, and surgeries. The key to success is making changes in daily eating and physical activity habits that can be maintained over children's lifetime. Since high school students spend most of their time in school, this is an important opportunity to make changes to their eating and nutritional behaviors. Moreover, obesity is more than simply an individual problem; it has become a community problem, driving up health care costs and decreasing productivity (Minnesota Department of Health, 2014). Communities play a significant role in improving the health of its members by increasing healthy choices through efforts such as building proper sidewalks in neighborhoods, increasing physical education in schools, increasing access to healthy foods in schools, and in communities. Improving the nutrition standards for foods offered in competition with federally reimbursable school meals may enhance the positive effects of school meal programs on student eating behavior. Also, implementing a successful physical education program at all high schools may lead to reduced childhood obesity.

## Limitations

There are some issues related to this study design, including choosing a representative sample which should represent the whole population. In addition, the sample size should be sufficiently large enough to estimate the prevalence of the conditions of interest with adequate precision. Furthermore, non-response is a particular problem affecting this study and can result in bias of the measure of outcome.

## Directions for Future Research

Childhood obesity has been considered by researchers as one of the most serious public health concerns of the 21st century and with good reason. It can harm nearly every system of child's body, including, social and emotional aspects. Providing opportunities for physical education in all high schools, healthy nutrition, access to clean water, and quality medical care will help reduce the rates of childhood obesity. Based on all the information compiled, it appears that childhood obesity is negatively related with physical education, healthy nutritional behaviors, access to trails and parks, and proper sidewalks. In many ways, choosing this topic is an expression of passion for the public health field and shows a desire to help reduce obesity rates in young children. Having the opportunity to be involved in this research proposal will provide the educational base needed to help people, and to understand and maneuver the policies, local laws, social customs, and other forces that might contribute to a successful reduction in childhood obesity rates. This exploratory proposal to reveal why the IHS program works can help researchers replicate its success and apply it to other high schools in King County, particularly those that have low-income students, and make it easier for those students to maintain healthy minds and bodies. Exploring in depth why the IHS program works and examining data from King County and the Healthy Youth Survey on childhood obesity, can help high schools in lower income neighborhoods benefit from IHS' success. Learning what works and apply-

ing it to schools with higher rates of obesity can help those schools reduce obesity rates among their students.

## References

- Centers for Disease Control and Prevention (2015). Childhood obesity facts. Retrieved from <http://www.cdc.gov/healthyschools/obesity/facts.htm>
- Harvard T.H Chan (n.d.). Retrieved from <https://www.hsph.harvard.edu/obesity-prevention-source/obesity-causes/television-and-sedentary-behavior-and-obesity/>
- How to Calculate BMI- BMI Formula (2015). Retrieved from <http://www.freebmicalculator.net/calculate-bmi.php>
- Interlake (2015). Retrieved from <http://www.bsd405.org/interlake/about/>
- Kahan, D., & McKenzie, T. (2015). The Potential and Reality of Physical Education in Controlling Overweight and Obesity. *American Journal of Public Health*, 105(4), 653-659. doi:10.2105/AJPH.2014.302355
- Leibole, M. (2015). Personal Interview. Physical Education Department, Interlake High School, Bellevue, WA.
- Madden, C. (2015). Personal Interview. Physical Education Department, Interlake High School, Bellevue, WA.
- Minnesota Department of Health (2014). The importance of a healthy weight. Retrieved from <http://www.health.state.mn.us/cdrr/obesity/healthy-weights.html>
- National Heart, Lung, and Blood Institute (2013). Why obesity is a health problem. Retrieved from <http://www.nhlbi.nih.gov/health/educational/wecan/healthy-weight-basics/obesity.htm>
- Obesity Adults/ King County (2009-2013). Retrieved from <http://www.kingcounty.gov/healthservices/health/data/~-/media/health/publichealth/documents/indicators/prevention/ObesityAdults.ashx>

Office of Superintendent of Public Instruction (n.d.). Healthy youth survey. Retrieved from <http://www.k12.wa.us/safetycenter/HealthyYouthSurvey/default.aspx>

Personal Health Investment Today America (n.d.). Benefits of P.E. in school. Retrieved from [http://www.phitamerica.org/benefits\\_of\\_p\\_e\\_in\\_school.htm](http://www.phitamerica.org/benefits_of_p_e_in_school.htm)

Public Health England (2015). Measurement of obesity. Retrieved from [http://www.noo.org.uk/NOO\\_about\\_obesity/measurement](http://www.noo.org.uk/NOO_about_obesity/measurement)

Seattle Public Schools Health Profile King County, Washington (2010-2012). Healthy youth survey. Retrieved from [http://www.kingcounty.gov/healthservices/health/data/~/\\_media/health/publichealth/documents/data/SchoolDistricts/SchoolDistrictSeattle.ashx](http://www.kingcounty.gov/healthservices/health/data/~/_media/health/publichealth/documents/data/SchoolDistricts/SchoolDistrictSeattle.ashx)

Story, M., Nanney, M., & Schwartz, M. (2009). Schools and Obesity Prevention: Creating School Environments and Policies to Promote Healthy Eating and Physical Activity. *Milbank Quarterly*, 87(1), 71-100. doi:10.1111/j.1468-0009.2009.00548.x

Sung, G. (2015). Comparisons of Bellevue high schools. Retrieved from <http://www.bellevuerealestateguy.com/comparisons-of-bellevue-high-schools-2/>

The Seattle Medium Newspaper (2015). New report finds a 17 percent decrease in youth obesity in King County. Retrieved from <http://seattlemedium.com/new-report-finds-a-17-percent-decrease-in-youth-obesity-in-king-county/>

Tonetti, L., Fabbri, M., Filardi, M., Martoni, M., & Natale, V. (2015). The association between higher body mass index and poor school performance in high school students. *Pediatric Obesity*. Advance online publication. doi:10.1111/ijpo.12075