Building Healthy Communities: Impacting Childhood Obesity Through Health Policy

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Introduction: Childhood Obesity

Obesity in children is a major public health issue that causes many health risks, including cardiovascular disease, diabetes, musculoskeletal disorders, and some cancers. According to the World Health Organization (WHO, 2020) worldwide obesity has nearly tripled since 1975. In 2015 to 2016 in the United States, 39.8% of adults and 18.5% of youth were considered obese (Hales, Carroll, Fryar, & Ogden, 2017). Although childhood obesity is preventable, rates are extremely high, especially among urban populations that experience health disparities (Isong et al., 2018).

Obesity in children is associated not only with poor health during childhood but also with detrimental health consequences during adulthood. Type two diabetes mellitus and cardiovascular disease are associated with obesity in childhood and are the result of insulin resistance, hypertension, abdominal obesity, and dyslipidemia (Gurnani, Birken, & Hamilton, 2015). Nonalcoholic fatty liver disease is common in obesity in all ages and is the result of fat deposition in the liver, which can lead to more serious liver dysfunction (Gurnani et al., 2015). Polycystic ovarian syndrome (PCOS) is more common in individuals who are obese and is the leading cause of infertility in women (Gurnani et al., 2015). Children who are obese are four to six times more likely to develop obstructive sleep apnea and are at an increased risk for injury on epiphyseal growth plates resulting in pain and limited mobility (Gurnani et al., 2015).

In addition to physical health risks, there is also a significant risk for psychological consequences in children who are overweight and obese. Children and adolescents who are overweight and obese are at an increased risk for depression, compromised perceived quality of life, anxiety, self-esteem, and behavioral disorders, which can continue into adulthood (Rankin et al., 2016). Children with obesity, especially girls, are more likely to use extreme weight-

controlling behaviors (vomiting, abusing laxatives, diet pills, fasting, or smoking), leading to an increased rate of eating disorders in this population (Rankin et al., 2016).

Obesity in children is a major public health issue that needs to be addressed because of the negative health and psychological outcomes it has on children. A population of major concern, and the focus of this proposal, is primary school-aged children in grades kindergarten through fifth grade in the Philadelphia School District. This population is impacted by both higher rates of obesity and substantial racial/ethnic disparities in obesity prevalence. Specifically, in 2016, over one in five children ages five to eighteen within the School District of Philadelphia were considered obese (Farley, Washington, & Whitley, 2019). The highest rates of children with obesity were in non-Hispanic black girls and Hispanic boys, 23.8% and 27.5%, respectively, populations who already experience elevated risks for health disparities (Farley et al., 2019). The rate of obesity in children in Philadelphia is higher than the national average, where 18.4% of children ages six to eleven and 20.6% of adolescents ages twelve to nineteen are considered obese (Hales et al., 2017).

Addressing childhood obesity can lead to substantial decreases in health care costs. When weight gain through adulthood among children of normal weight is accounted for, the incremental lifetime direct medical cost of a ten-year-old child with obesity, when compared to a ten-year-old child with a normal weight, ranges from $12,660 to $19,630 (Finkelstein, Graham, & Malhotra, 2014). Further, when weight gain through adulthood among children of normal weight is not accounted for, this number ranges from $16,310 to $39,080 (Finkelstein et al., 2014). Weight management and obesity prevention in children is vital to decreasing lifetime medical costs.

Interventions addressing the prevention of obesity in children are cost-effective and must

be evaluated. Prior research has examined cost-effectiveness of four childhood obesity interventions, including "sugar-sweetened beverage excise tax (SSB), eliminating tax subsidy of TV advertising to children (TV AD), early care and education policy change (ECE), and active physical education (Active PE)" (Gortmaker et al., 2015). If these interventions are maintained, after ten years the projected net cost savings would include 55$ and 38$ for SSB and TV AD savings for every dollar spent and an additional revenue of $12.5 billion per year and $80 million per year, respectively (Gortmaker et al., 2015). This additional revenue can then be used for policy and program change.

In Philadelphia, there are many health policy interventions that are already being implemented to address the issue of obesity in children. For example, in 2017, a beverage tax of $0.015/ounce on sugar and sugar-substitute beverages was implemented (Zhong, Auchincloss, & Kanter, 2018). After two months of the tax, daily consumption of regular soda was 40% lower, consumption of energy drinks was 64% lower, and consumption of bottled water was 58% higher (Zhong et al., 2018). Although further studies need to be done on the long-term impact of the beverage tax, the short-term impact led to decrease in sugary-drink consumption.

Another health policy intervention includes the School District of Philadelphia's Eat Right Philly (ERP) program, funded by the USDA Supplemental Nutritional Assistance Program Education, and includes twenty school partners (Health Promotion Council, 2018). This program strives to provide Philadelphia's public schools with nutrition education that focuses on identifying healthy eating and physical activity options, with the end goal to guide behavioral changes (Health Promotion Council, 2018). These interventions, among many others, strive to encourage healthy behaviors in the community, thereby decreasing obesity in children.

Social Determinants of Health and Childhood Obesity

Social determinants of health (SDOH) are the circumstances in communities and societies that exert influences on the outcomes of those who live there. Defined by the World Health Organization as the environment in which people grow, live, age, work, and are born into (2020); Although these social and physical determinants do not dictate outcomes with certainty, the recognition of their impact on health outcomes and population health has been the rationale behind critical nationwide attempts at health improvement. In an effort to address these, the Office of Disease Prevention and Health Promotion (ODPHP) (2020), has designated the creation of social and physical environments that promote good health for all as one of its main four overarching goals for Healthy People 2020. In utilizing this place centered approach, Healthy People (2020) has created a framework consisting of five key areas of social determinants of health which includes a) neighborhood and built environment, b) health and health care, c) social and community context d) education, and e) economic stability.

SDOH directly impact childhood obesity prevalence and treatment. Consisting of factors in the community and environment such as housing, access to healthy foods, neighborhood crime and environmental conditions; the outcomes of these factors greatly affect a family's ability to work against obesity in childhood. One major environmental factor affecting obesity is access to healthy foods. For the first time, the City of Philadelphia conducted a Neighborhood Food Retail in Philadelphia (2019) assessment which found significant health disparities in access to nutritious foods. Although many small retail stores were readily visible and available in the city, they had a significant amount of low-produce and non-nutritious foods items. More than four out of five food stores were found to have substantial amounts of unhealthy foods with low supplies of produce and only one in nine stores offering significant amounts of produce and healthy

foods. In total, 13% of Philadelphians have access to little or no retailers with high produce or healthy foods, with lower income neighborhoods having a disproportionately higher number of low produce stores (Neighborhood Food Retail in Philadelphia, 2019).

When considered alongside the reported poverty rate of 24.5% in adults and 34.6% in children per Philadelphia's Community Health Assessment (2019), the access to retailers with unhealthier but more affordable food options may seem more feasible for families and thus a likely contributor to obesity in children. Additionally, with more than 50% of children living in single parent homes, going to smaller retailers that are readily accessible may decrease hardships for families already experiencing additional stressors. Crime, a critical social determinant decreased 25% from 2009-2018, however rates remain high with an incidence report of 909 per 100,000 persons (Philadelphia's Community Health Assessment, 2019). These rates can also impact obesity in children by limiting their abilities to go outside and play and be physically active.

Healthcare Environment

Currently the sixth largest city in the United States, 21% of Philadelphia's population is under the age of eighteen years old (U.S. Census Bureau, 2019). Many youth in Philadelphia experience barriers to good health. Per Philadelphia's Community Health Assessment (2019), 36% percent of children lived in poverty it was estimated that just over one in five children ages five to eighteen who attend public schools were obese. Of these, 3.1% are uninsured. While there has been a recent increase in access to primary care providers, clusters of areas still exist which meet the federal definition of having a primary care provider shortage, and often these areas are those in which residents are of lower socioeconomic status (Philadelphia's Community Health Assessment, 2019).

Philadelphia has several robust healthcare systems dedicated to the care of children. St. Christopher's Hospital for Children, the only children's hospital in north Philadelphia provides level one trauma care and primary care. Their specialties include clinical nutrition services composed of registered dieticians (RD) that provided both in and outpatient services for a variety of nutritional needs including obesity management (2018). Children's Hospital of Philadelphia (CHOP), a leading health care organization dedicated to the care of children has a center dedicated to childhood obesity prevention and research with services such as the Healthy Weight Program established in 2005 designed to promote the prevention and treatment of childhood obesity (CHOP, 2020). They also incorporate a Healthy Weight Food Pharmacy designed to increase access to healthy foods for families experiencing food insecurities. To bridge the gap, families are connected with social workers who assist with linking them with additional valuable resources such as Supplemental Nutrition Assistance Program (SNAP), Women, Infants, and Children (WIC), and local food pantries.

Both strengths and weaknesses exist in the current healthcare landscape of Philadelphia. One strength is the data-driven approach to understanding residents' health needs. For example, in north Philadelphia, the Temple University Health Care System (TUHS) has taken the initiative to complete a community health needs assessment, that collaborates with residents in the community to ensure their voices are heard and their needs understood. The assessment has informed efforts to address community needs, such as local implementation of the Diabetes Prevention Program (DPP) which focuses on education related to lifestyle modifications. Unfortunately, the health care landscape is not without weaknesses. Access to pediatric nutritionists are limited and often capitated to the specific institutions with insurance stipulations. This adds to provider strain related to high demand, which in turn can render patients unable to

access care. Inaccessibility can increase children's risk for obesity as well as poor management of associated chronic conditions. Another weakness centers around financial strain in health care as seen in north Philadelphia with the closure of Hahnemann University Hospital (2018) which was once a large level one trauma community-based hospital. The closure has placed a burden on both patients and other healthcare institutions within the city of Philadelphia.

Building Health Communities: Policy Proposal & School-Based Strategies

Health agencies such as Centers for Disease Control and Prevention are calling for schools to play a larger role in battling against childhood obesity (Centeio et al., 2018). Given the need to address obesity in children and the potential promise of school-based interventions, we are proposing funding for the Building Healthy Communities Program, which entails four specific strategies in all Philadelphia elementary schools to combat childhood obesity.

The first strategy of Building Healthy Communities is that every elementary school in Philadelphia has a wellness council that is composed of school staff, including classroom teachers, physical education teachers, classroom assistants, school nurses, principles and other ancillary staff members. Each wellness council will have a member designated as the wellness champion. Preferably, the wellness champion should be someone who is qualified to provide education and training on health promotion and lifestyle changes, such as the school nurse. In collaboration with all members of the wellness council, the wellness champion will formulate a school-wide written wellness policy called "Building Healthy Communities". The wellness champion will solicit input from the wellness council on leading school-wide wellness activities, coordinating staff training, and ensure that components on the "Building Healthy Communities" policy are implemented appropriately.

The "Building Healthy Communities" policy includes 8 proposed components: (i) all

physical education teachers will be required to complete Exemplary Physical Education Curriculum (EPEC) training which is a nationwide school reform initiative that shifts the focus of physical education (PE) from keeping children busy towards instruction based on clearly-stated outcomes. The goal of EPEC is to change the practice and perception of PE in order to prepare children for a physically active lifestyle (Michigan Fitness Foundation, 2017); (ii) classroom teachers will be trained by wellness champions on integrating 5-6 lessons per year on physical activity and health eating (healthy eating lessons should be derived from evidence-based USDA lesson plans); (iii) classroom teachers are encouraged implement physical activity breaks into classroom routines (training and resources on how to do so provided by PE teachers and wellness champions); (iv) classroom teachers are encouraged to keep log of healthy eating lessons and physical activity breaks; (v) teachers will be encouraged to adopt a culture of health in their classrooms by encouraging physical activity homework and creating rules/incentives around healthy snacks/treats; (vi) each school will be provided resources to ensure they have recess carts that contain all needed items to keep children moving (balls, jump ropes, balls, etc.); (vii) emphasis will be placed on children needing aftercare services to ensure that children in aftercare are provided with health snacks/treats and opportunity to engage in physical activity; Lastly, (viii) school administrators are encouraged to supervise accountability of staff through professional evaluation.

The second strategy of Building Healthy Communities is related to changes in school environment. Strategies that aim to change school culture will have a long-term effect and create sustainable changes, thus creating an opportunity to prevent obesity in children (Sbruzzi et al., 2013). To create a change in every school environment, we suggest removing sugary beverages in vending machines and replacing them with water and removing snacks/treats from vending

machines. In addition, we propose increasing availability of fruits, vegetables, whole grains, and substituting whole milk for reduced fat or skim milk. Teachers are encouraged to have healthy snack/treat options in their classrooms which can be used as an incentive for academic performance or good behavior. Classroom teachers are encouraged to introduce "fruit of the week" which is a great way to get children excited about healthy alternatives. Introducing "fruit of the week" not only provides a healthy alternative for snacks/treats, but it also provides an opportunity to introduce new foods that children may not have the chance to try at home.

The third strategy of Building Healthy Communities entails family involvement. Parental influence plays a significant role in children's nutritional and physical activity habits (Lambrinou et al., 2020). To get families involved, we propose inviting parents to participate in school-wide wellness activities such as yoga and/or educational sessions on healthy eating. Newsletters should also be sent home that contain healthy recipe alternatives to try at home. Given the socioeconomic hardship of the Philadelphia urban population, members of each wellness council must consider the cost of items needed for recipes. Meetings at school with parents have been found to be more effective in parental involvement than just providing written materials (Lambrinou et al., 2020). Therefore, classroom teachers are encouraged to use times such as parent-teacher conferences to discuss newsletter information that have been sent home.

The last strategy we are proposing for this 2-year proposal is incorporating gardening lessons into classroom curriculums. Preferences for foods and dietary habits are established at a young age. Gardening is a promising strategy to improve children's dietary preferences and habits (Evans et al., 2016). Research that has examined the impact of school-based gardening on children's eating behaviors have shown positive trends in fruit and vegetable preferences, willingness to try different vegetables, increased nutritional knowledge, and improved weight

status (Evans et al., 2016). Given financial cost and space restraints, the burden cannot be placed on caregivers and families to initiate a home-based garden. Therefore, a school-based gardening initiative will afford all children in Philadelphia elementary schools the opportunity to engage in the experience of gardening.

Building Healthy Communities: Outcomes Measures

Classroom teachers and physical education teachers are an integral aspect of this proposal as their role in imperative to ensure carry-over sustainability of the program. Prior to implementing the strategies previously discussed, implementation readiness of school leaders and school staff should be considered to assess acceptability. Once readiness is assessed, clear outcome measures need to be set. We suggest conducting curriculum surveys and focus groups. School staff would provide feedback on appropriateness of implementing healthy eating and physical activity lessons into their existing curriculums. Curriculum surveys should also address implementation fidelity. Focus groups should be conducted with school staff and family members during school-wide wellness activities, which provides an opportunity for school staff, caregivers, and family members to discuss concerns and/or ideas for program improvement. Second, the goal is to assess for changes in school lunch quality and physical activity equipment availability over 2 years. To move towards a culture of health, each school should take incremental steps to ensure that healthier breakfast and lunch options become available. Resources should also be allocated appropriately to ensure children have the equipment they need to engage in physical activity. The last outcome measure is a clinical outcome measure that can be measured 2 years into the program and beyond. Body mass index (BMI) percentile and waist to height ratio (WHtR) can be measured in children who attend the schools where the program is implemented.

There are several key individuals we have identified as key stakeholders in this proposal. Their influential roles are essential to ensuring successful implementation of the Building Healthy Communities Program. First, state legislators, school board members, and Philadelphia School District administrators are key members that have an effect on legislation that dictates school policy. Second, the support of Philadelphia public school staff is imperative to ensure successful carry-over of the strategies and interventions proposed. The goal is for school staff members to gradually assume ownership of the Building Healthy Communities Program to ensure sustainability. Lastly, the support of parents and guardians is critical as children learn behaviors from them and studies show a link between parental behaviors and children's eating habits (Yee, Lwin, Ho, 2017). Cooperation and dedication from all key players is needed to ensure that we invest in the health and wealth of all children in Philadelphia elementary schools.

Building Healthy Communities: The DNP Role

Due to the significant increase in obesity prevalence and the serious public health consequences, obesity is now considered one of the most important public health challenges of the twenty-first century (Lambrinou et al., 2020). As a result, doctorally prepared nurses have the responsibility of tactically addressing the issue of obesity in children through education and advocacy. Due to the lack of and access to resources in the Philadelphia urban community, DNP prepared nurses can bridge the gap by collaborating with community organizers to plan events such as health fairs and activities for children in the community that encourage physical activity. In addition to education and health promotion, DNP prepared nurses are leaders in advocating for health policy initiatives. What we have proposed addresses the changes that need to take place in Philadelphia public elementary schools to improve the health outcomes of all children.

We understand the financial constraints that the Philadelphia School District faces. As with most policy proposals, there is a need for funding. School staff will need on-going training and support that requires time and resources. Financial resources will also be needed to ensure that every school have recess carts to encourage physical activity. To cut costs, we propose collaborating with DNP students and/or DNP prepared nurses with expertise in child health education and promotion, to assist with on-going training that will be needed. In addition to funding, other limitations to the proposal are: acceptability of school staff and caregivers to participate; adoption from school administrators and school staff to fully embrace a culture of health at their schools; and feasibility of proposed strategies. We believe that sustainability can be achieved when key stakeholders are truly vested in tackling the public health issue of obesity in children, whether it be state legislators, school board members, or school staff members.

Building Healthy Communities is an initiative that will take place in elementary schools in Philadelphia, with the goal of cultivating a long-term benefit for our society as a whole. Our proposed initiative will not only treat obesity in children, but prevent it and result in a decrease in nutrition related physical and psychological illnesses. The savings in healthcare costs associated with diseases such as cardiovascular disease and diabetes has the possibility to positively change the lives of many low-income households. A policy change in the schools is necessary and long overdue. The value of educating the children of Philadelphia about health and wellness will be insurmountable.

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