2019

A Community Outreach Project Addressing Mental Health, Obesity, and Asthma in Underserved Saint Paul Youth

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A COMMUNITY OUTREACH PROJECT ADDRESSING MENTAL HEALTH, OBESITY, AND ASTHMA IN UNDERSERVED SAINT PAUL YOUTH

A MASTER'S THESIS SUBMITTED TO THE GRADUATE FACULTY

GRADUATE SCHOOL BETHEL UNIVERSITY

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IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTERS SCIENCE IN PHYSICIAN ASSISTANT

JUNE 2019

ABSTRACT

Due to a lack of resources, awareness, and reinforcement of information, underserved youth are predisposed to unique health concerns. The health disparities prevalent among children living in poverty are many, but the topics of focus for this community outreach project include mental health, obesity, and asthma. Supplemental health education curriculum has the potential to alleviate the health disparities prevalent among such a vulnerable population (Thomas & Aggleton, 2016). To address the health disparities present specifically among underserved youth in St. Paul, MN, the group partnered with the after-school tutoring program at Central Baptist Church to provide education on the topics of stress reduction, obesity prevention, and asthma management. The supplemental health education was delivered in the form of interactive, sustainable health kits that focus on each specific health topic. Each health kit contained informational handouts and materials for activities, including written curriculum and scripts for future use. The health kits were demonstrated to the elementary students and program tutors over the course of two nights of programming. Both nights of demonstrations were met with success, as demonstrated by student and tutor responsiveness, level of engagement, and feedback. All health kits were donated to Central Baptist Church for future use and implementation into the program.

TABLE OF CONTENTS

LIST OF APPENDICES

Chapter 1: Introduction

Introduction

Poverty, health outcomes, and academic success are all interrelated, impacting the upbringing of the nation's youth. In 2017, approximately 150,000 children in Minnesota alone were living in poverty (Minnesota State Demographic Center [MSDC], 2018). In addition, over 50% of the 493 Minnesota public schools are considered to have high free and reduced-priced lunch eligibility, which students qualify for based on family income (Minnesota Department of Education [MDE], 2018). The widespread issue of poverty in Minnesota has important implications on the overall health and academic outcomes of the students afflicted.

Studies have identified a clear relationship between low socioeconomic status in childhood with poorer health outcomes (Fitzsimons, Goodman, Kelly, & Smith, 2016; Li, Mustillo, & Anderson, 2018). Specifically, children in poverty are at an increased risk for mental health problems, including depression and anxiety (Fitzsimons et al., 2016). Researchers have also found that low socioeconomic status in childhood is associated with obesity (Li et al., 2018). Obesity in turn puts children at an increased risk for developing diabetes (Huether & McCance, 2017). Likewise, researchers have identified a strong link between socioeconomic status and the development of asthma during childhood, due to a combination of social and environmental factors (Gong et al., 2014). Therefore, it is paramount that healthcare professionals are aware of the health disparities among low socioeconomic, underserved youth. A focus on health education, prevention, and awareness of these issues may help alleviate this healthcare burden.

The following community outreach project will focus on poverty-related issues pertaining to stress, obesity, and asthma. By providing supplemental education to the Central Baptist

Church after-school tutoring program, students will gain the opportunity to learn about the health issues they may be predisposed to. Additionally, tutors will be utilizing kits to integrate health education curriculum focused on preventing disease and managing symptoms. Central Baptist Church is located in Saint Paul, MN, and collaborates with Hamline Elementary and Murray Middle School. On a nightly basis, Central Baptist Church tutors work with a diverse population of approximately 20 students. Partnering with this organization is a small step towards achieving the ultimate goal of increasing health education in the Minnesota public school system.

Background to the Problem

Poverty is defined as an "economic state that does not allow for the provision of basic family and child needs, such as adequate food, clothing, and housing" (Wood, 2003, p. 707). According to Fontenot, Semega, and Kollar (2018, p. 14), "approximately 12.8 million (17.5%) children under the age of 18 were considered to be in poverty in 2017." In Minnesota, 12% of children between the ages of 0-17 were reported to be living in poverty in 2017 (MSDC, 2017). However, the prevalence of poverty in Minnesota varies by county of residence. Ramsey county, where Hamline Elementary and Murray Middle School are located, has a poverty rate of 13.9% (United States Census Bureau [USCB], 2017). Within Hamline Elementary and Murray Middle School, the percentage of students who qualify for free/reduced price lunch are 80% and 62% respectively (Akyea, 2016).

As the poorest members of our society, children are at an increased risk for negative health and educational outcomes (Dreyer, Chung, Szilagyi, and Wong, 2016). According to Chaudry and Wimer (2016, p. 23), "early experiences of poverty, longer durations of poverty, and higher concentrations of poverty in the community lead to worse child outcomes." Childhood obesity was found to be 40% more prevalent among children growing up in poverty,

and asthma was found to be 30% more prevalent (Chaudry & Wimer, 2016). In addition, higher rates of asthma are associated with increased exposure to environmental pollutants associated with lower quality housing, as well as decreased access to healthcare services, and higher rates of childhood obesity are associated with a lack of opportunities and/or facilities to engage in physical activity outside of the school setting (Gupta, de Wit, & McKeown, 2007).

Looking beyond physical health, children in poverty are also at an increased risk for developing mental health problems such as conduct disorder, hyperactivity, and emotional disorders (Gupta et al., 2007). According to Wood (2003), early exposure to poverty has a greater impact on educational attainment than exposure to poverty later in life. Specifically, poverty negatively impacts grade level completed and IQ scores (Wood, 2003). High school dropout rates were found to be twice as high in inner city students, who were exposed to poverty during childhood, and IQ scores were 6-13 points lower (Wood, 2003).

In an attempt to help reduce the impact of poverty on students, health education and prevention strategies have been implemented in schools, which is one of the most effective environments for promoting overall health, especially for those with few resources (Weare and Markham, 2005). For example, Meiklejohn et al. (2012) focused on integrating mindfulness practices into K-12 education to reduce stress, anxiety, and depression among students, while Oude Luttikhuis et al. (2009) introduced weight-management strategies into schools to promote healthy choices and reduce obesity among youth. Lastly, Pike et al. (2011) incorporated asthma awareness education into fourth and fifth grade math and science classes to increase student understanding of the triggers, symptoms, and treatments associated with an asthma attack. While positive learning outcomes support implementing preventative health education into school systems, not all school systems have worked to make this a reality yet, especially in underserved

areas, and gaps remain in health education (Weare, 2017). Advocacy by healthcare professionals and organizations, in support of preventative health measures in school settings, remains an important determinant of the future trajectory of health education among students.

Problem Statement

Underserved youth face unique health concerns that are exacerbated by a lack of resources, awareness, and reinforcement of information. Recognizing this disparity, supplemental health education curricula should be implemented into extracurricular or after school programs to spread awareness among underserved students. Additional health education will help to alleviate negative health outcomes associated with low-socioeconomic status.

Purpose of the Project

The purpose of this community outreach project is to supplement the health education curriculum of underserved elementary and middle school-aged children by offering hands-on learning activities about mental health, obesity, and asthma in order to spread awareness about each disease state and encourage prevention. Specifically, the curriculum will be demonstrated to the students and tutors of extended-day (EDL) learning activities at Central Baptist Church in St. Paul, MN, during their after-school program. Students will be able to learn through hands-on activities, while tutors will learn how to reproduce the curriculum for future sessions. In addition, the materials used will be donated to Central Baptist Church, making it a sustainable project that will continue to impact this underserved population.

Significance of the Problem

Poverty among children remains a problem in the United States, as child poverty rates are twice that of other developed countries (Dreyer et al., 2016; McCarty, 2016). Due to poverty exposure, children are at an increased risk of developing chronic disease and poor mental health

or behavioral issues (Gupta et al., 2007). In light of this, the United States faces a serious health disparity among its vulnerable youth: the impact of low socioeconomic status on both physical and mental health.

The health outcomes of children living in poverty have profound implications on the physician assistant (PA) profession and the healthcare system as a whole. Studies have shown that the negative health consequences of childhood poverty persist into adulthood (Dryer et al., 2016). In the words of Kelishadi et al. (2018, p. 133), "Health in childhood and adolescence is the basis of health in adulthood." Thus, low socioeconomic status has health consequences on the children of today and the adults of tomorrow. PAs and other members of the healthcare team must be prepared to address these health needs as they present in patients today and in the future. A key component to this preparation is awareness of at-risk populations. PAs must be informed of the unique health challenges children in poverty face, both presently and in the future. Awareness of the impact environmental factors have on chronic disease states and mental health is very important. Such awareness will aid the PA in gathering a thorough, targeted social history, and guide the PA towards making an accurate diagnosis and effective treatment plan for individuals of this population.

Furthermore, increased awareness of the factors influencing underserved youth will help PAs and other members of the healthcare system participate in community-wide educational programs aimed at preventing healthcare issues before they arise. A focus on prevention would not only help patients individually, but also alleviate some of the burden put on the healthcare system. According to the Centers for Disease Control and Prevention [CDC] (2018, p.1), "90% of the nation's annual healthcare costs are for people with chronic and mental health conditions". Efforts geared toward preventing chronic disease would help to reduce these costs (CDC, 2018).

The healthcare system is not the only network of individuals who can utilize this knowledge. School systems can also benefit from awareness of the health issues facing underserved youth and can participate in programs aimed at alleviating these issues. Studies have demonstrated that schools are a highly effective environment for raising awareness of health issues, especially among underserved students where school may be their only resource for understanding these health concerns (Weare & Markham, 2005). Some school systems have already integrated health education into their curriculum through what has been termed a whole school approach (Thomas & Aggleton, 2016). Schools that have implemented a whole school approach have been successful in creating atmospheres that promote health and well-being.

Future research on the topic of childhood poverty and health outcomes will continue to advance the scientific community. Current research has shown a correlation between socioeconomic status and prevalence of mental health disorders, obesity, and asthma at the cellular and molecular level (Gellci et al., 2019; Li et al., 2018; Farrell et al., 2018; Miyasaka, Dobashi-Okuyama, Takahashi, Takayanagi, & Ohno, 2018). As research and awareness continue to progress, more findings will inevitably be uncovered regarding specific pathways by which environmental factors contribute to the development of disease, and this information will continue to guide health prevention programs and educational initiatives.

Discussion of the Needs Assessment

Members of the Saint Paul School District, Hamline Elementary School, and Murray Middle School provide students with the opportunity to participate in EDL activities held at Central Baptist Church (Saint Paul Public Schools [SPPS], 2017). Each EDL session includes basic math and reading instruction, as well as applied academic (enrichment) activities. EDL sessions are held twice a week for a duration of 1.75 hours each (SPPS, 2017). Snack and

transportation are provided by the school, and academic support is provided by community specialists (SPPS, 2017). The goal of EDL is to provide urban youth with the opportunity to explore and discover in a safe, structured, and supportive environment (SPPS, 2017). Since poverty prevalence in Ramsey county is 13.9%, and the majority of the students at Hamline Elementary School and Murray Middle School qualify for free/reduced price lunch based on family income, EDL is looking to educate students about stress, obesity, and asthma, which are common conditions presenting in urban youth exposed to poverty.

Limitations of Study

The following community outreach project serves to provide health education to students currently enrolled in Kindergarten through 8th Grade. Students must be enrolled in the EDL program at either Hamline Elementary School or Murray Middle School. The first limitation to this project is the demographics of the student population, which consists only of those who voluntarily participate in EDL at Hamline Elementary School or Murray Middle School. In the future, consideration should be made to expand this health curriculum to serve more schools in the Minneapolis-Saint Paul metropolitan area. The second limitation of this project is a lack of financial resources. All health education kits must be self-sustaining and must not require any additional funding to be supplied appropriately.

Definition of Terms

The following terms have been chosen to be defined by this community outreach project.

Asthma: "A chronic inflammatory disorder of the bronchial mucosa that causes bronchial hyperresponsiveness, constriction of the airways, and variable outflow obstruction that is reversible" (Huether & McCance, 2017, p. 698).

Childhood Obesity: "A BMI at or above the 95th percentile for children and teens of the same age and sex" (CDC, 2016).

Diabetes: "A group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both" (Huether & McCance, 2017, p. 41).

EDL: Hamline Elementary School and Murray Middle School afterschool program (SPPS, 2017).

Mental Health: "A state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community" (World Health Organization [WHO], 2004, p. 12).

Mindfulness: A state of awareness that comes from intentionally focusing on the present moment without judgment (Meiklejohn et al., 2012).

Poverty: "An economic state that does not allow for the provision of basic family and child needs, such as adequate food, clothing, and housing" (Wood, 2003, p. 707).

Socioeconomic Status: Social standing measured as a combination of factors including education, income, and occupation (American Psychological Association [APA], 2018).

Whole School Approach: "Attempts to shape the whole school context, including the school's ethos, organization, management structures, relationships, and physical environment, as well as the taught curriculum and pedagogic practice, so that the total experience of school life is conducive to the health of all who learn and work there" (Weare & Markham, 2005, p. 118).

Conclusion

Poverty and negative health outcomes are intricately intertwined, with the risk of health issues being directly correlated to the duration, intensity, and surrounding poverty levels of those enduring it (Chaudry & Wimer, 2016). Therefore, children are most greatly impacted by this

disparity, being exposed earlier in life and increasing their predisposition to negative health outcomes such as stress, obesity, and asthma (Chaudry & Wimer, 2016). In addition to a lack of resources, awareness, and reinforcement of information at home, underserved students are not receiving adequate health education in the school setting to encourage prevention.

Healthcare providers and school systems must be educated on how poverty impacts student health outcomes in order to implement prevention strategies, spread awareness, and provide resources. Not only will this affect the health of students today, but also the health of adults tomorrow, further impacting the healthcare system as a whole now and in the future. The following literature review will express the need, progress, and future direction that health education needs to take in order to change the health outcomes of the most financially poor members of society.

Chapter 2: Literature Review

Introduction

Poverty is a persistent problem in the United States that strongly predicts educational outcomes, chronic disease development, and the prevalence of adverse childhood experiences (Dreyer et al., 2016). Research suggests that exposure to poverty during childhood is associated with significant health and developmental challenges (Chaudry & Wimer, 2016). As the most financially poor members of our society, children are at an increased risk for negative physical, mental, and emotional health consequences (Dreyer et al., 2016). The following literature review focuses on poverty and its impact on the development of childhood obesity, asthma, and mental health conditions. Low socioeconomic status is associated with environmental and social factors that contribute to poor physical and mental health. Understanding how socioeconomic status contributes to the pathogenesis of these disorders is helpful in developing prevention programs.

Definition of Poverty

Poverty is a measure of income disadvantage and material hardship (Dreyer et al., 2016). In 2017, 39.7 million people were reported to be in poverty in the United States (Fontenot et al., 2018). Although poverty impacts a large portion of the population, it is especially problematic for children (Dreyer et al., 2016). According to data collected by the U.S. Census Bureau, 17.5% of the population under the age of 18 were reported to be living below the U.S. federal poverty level (Dreyer et al., 2016). This value is nearly twice as high as child poverty rates reported in other highly developed countries (Dreyer et al., 2016; McCarty, 2016). The federal government has implemented family-orientated anti-poverty measures such as the Supplemental Nutrition Assistance Program (SNAP) and the Special Supplemental Nutrition Program for Women,

Infants, and Children (WIC). Despite these efforts, children remain the most financially poor members of our society (Dreyer et al., 2016).

Wood (2003, p. 707) defines the child poverty rate as the "proportion of families with children who have incomes below the nationally established poverty line." According to the U.S. Department of Health and Human Services (HHS) (2018), the poverty line for households of three, four, and five are $20,780, $25,100, and $29,420 respectively. For households greater than five, approximately $4,320 is added for each additional person (HHS, 2018).

Poverty rates in Minnesota decreased from 11.9% in 2011 to 9.5% in 2017 (MSDC, 2018). Although the number of families reported to be living with incomes below the federal poverty threshold has declined, approximately 150,000 Minnesotan children were still living in poverty in 2017 (MSDC, 2018). To further assess childhood poverty prevalence in Minnesota public school districts, statistics regarding eligibility for free and reduced-price lunch are analyzed. Free and reduced-price lunch eligibility is determined by income and household size (MDE, 2018). For a household size of three, a yearly income below $27,013 qualifies for free lunch, and a yearly income between $27,015-38,443 qualifies for reduced price lunch (MDE, 2018). For a household size of four, a yearly income below $32,630 qualifies for free lunch, and a yearly income between $32,631-46,435 qualifies for reduced price lunch (MDE, 2018). For a household size of five, a yearly income below $38,246 qualifies for free lunch and a yearly income between $38,247-54,427 qualifies for reduced price lunch (MDE, 2018). According to the Minnesota Department of Health (2016), four in ten Minnesota public school students were eligible for free and reduced-price lunch during the 2015-2016 school year. Amongst the 493 Minnesota public schools considered to have high (50% or more) free and reduced-price lunch eligibility, 31% were elementary schools or combined K-12 schools, 17% were middle or junior

high schools, and 16% were secondary or senior high schools (MDE, 2016). Counties in the Minneapolis-Saint Paul area with the highest reported free and reduced-price lunch eligibility include: Ramsey (57%), Hennepin (25.1-50%), and Anoka (25.1-50%) (MDE, 2016).

The timing and duration of poverty exposure are important determinants of childhood health and developmental outcomes (Chaudry & Wimer, 2016). Green, Stritzel, Smith, Popham, and Crosnoe (2018) suggest that duration of poverty exposure is a better indicator of future health risk than timing of poverty exposure. When analyzing the average duration of childhood poverty exposure in the U.S., results suggest 40% of children experience poverty during all three life stages: early life (0-5), mid-childhood (6-10), and early adolescence (11-15) (Green et al., 2018). The negative consequences of poverty on child health and well-being are often lifelong (Dryer et al., 2016). Specifically, children exposed to persistent poverty have increased frequency and severity of chronic diseases such as asthma and obesity, as well as increased prevalence of mental health and behavioral problems (Gupta et al., 2007).

Impact of Poverty on Childhood Health

Children of low socioeconomic status have poorer health than children of higher socioeconomic status (Fitzsimons et al., 2016). The social, environmental, and biologic factors that economically disadvantaged children face contribute to this health disparity. This community outreach project will narrow its focus on mental health problems, obesity, and asthma. Thus, detailed information will be provided on the role of socioeconomic status in the pathogenesis of these specific health conditions. In addition, special attention will be given to the cellular and molecular mechanisms by which socioeconomic status impacts a child's health. Lastly, unique risk factors encountered by this population will be discussed.

Mental Health. Mental health problems affecting children include depression, anxiety, and drug and alcohol abuse, among others (Fitzsimons et al., 2016). According to Chen (2004), children of low socioeconomic status experience more negative emotional states, such as anxiety and depression, than those of higher socioeconomic status. Specifically, stress, depression, and emotional issues are all associated with low socioeconomic status (Washington State Department of Health [WSDOH], 2013). Furthermore, "people who are in the low-income category are almost twice as likely to have perceived poor mental health when compared to their wealthier counterparts" (WSDOH, 2013, p. 9). Numerous social and environmental factors contribute to the mental health disparity affecting economically disadvantaged children. For example, external factors in low income communities have negative consequences on the body's natural cellular and molecular pathways (Gellci et al., 2019).

Low socioeconomic status is associated with social and environmental factors that affect mental health. According to the WSDOH (2013), the economic and neighborhood environment contributes to mental health conditions. Children of low socioeconomic status tend to experience more negative life events or stressors than children of higher socioeconomic status (Chen, 2004). Specifically, low socioeconomic status creates more household stress compounded by poor housing quality, lack of steady income, and marital problems, which has negative consequences on childhood health (Fitzsimons et al., 2016).

Through neuroimaging studies, researchers have identified specific effects that low socioeconomic status has on various parts of the brain (Gellci et al., 2019). Specifically, low socioeconomic status impacts regions devoted to cognitive and emotional skills, including executive functioning and social-emotional processing (Gellci et al., 2019). Furthermore, researchers have identified other effects on a network in the brain called the Salience and

Emotional Network (SEN), which connects regions of the brain associated with cognitive and emotional processes (Gellci et al., 2019). Proper maturation of the SEN is important in developing cognitive and emotional processes all the way into adulthood (Gellci et al., 2019).

The specific mechanism by which socioeconomic status affects SEN is not fully understood (Gellci et al., 2019). Researchers understand that the neurons in this network develop during childhood (Gellci et al., 2019). Therefore, nutritional deficiencies, inflammation, and exposure to environmental toxins during childhood could alter proper SEN development (Gellci et al., 2019). Since children living in economically disadvantaged communities are often exposed to hazardous waste, air pollution, and poor housing and educational facilities, socioeconomic status has a significant impact on the development of the SEN (Gellci et al., 2019).

Obesity. According to the CDC (2016, p. 1), "obesity is defined as a BMI at or above the 95th percentile for children and teens of the same age and sex." Socioeconomic status has been recognized as an important determinant of childhood obesity, which varies across the globe according to each country's income (Kelishadi et al., 2018). In developed countries, lower socioeconomic status is associated with a higher prevalence of obesity (Kelishadi et al., 2018). However, in the U.S., obesity is prevalent among all socioeconomic groups, though its prevalence is greatest among those who are socioeconomically disadvantaged (Li et al., 2018).

Several factors contribute to the high prevalence of obesity among children of low socioeconomic status. Specifically, economically disadvantaged communities may not have as many resources for health-promoting behaviors, such as exercising, eating a healthy diet, and not smoking (Chen, 2004). As a result, children of low socioeconomic status may not engage in health-promoting behaviors as much as children of higher socioeconomic status (Chen, 2004). For example, low income communities may have fewer public parks or other areas for exercise,

and grocery stores may not provide enough healthy products to poorer communities (Chen, 2004). Overall, limited access to nutritious foods, such as fruits and vegetables, is a key component that plays a role in the development of obesity (Kelishadi et al., 2018).

Low socioeconomic status is also associated with life stressors, which indirectly contribute to obesity (Li et al., 2018). Exposure to toxic stress in utero or early childhood sets in motion metabolic and neuroendocrine adaptations that lead to increased susceptibility for obesity by decreasing satiety (Li et al., 2018). In addition, children born to mothers of low socioeconomic status may not have received adequate nutrition in utero (Li et al., 2018). Undernutrition during the prenatal period, as well as in early childhood, is associated with metabolic changes that can lead to an increased risk for adult obesity (Li et al., 2018).

Childhood obesity has long-term health effects. As stated by Kelishadi et al. (2018), a determinant of health in adulthood is an individual's health during childhood. Specifically, social and environmental factors encountered during childhood can impact long-term health. For example, lack of resources during childhood leads to the development of unhealthy habits that can persist into adulthood (Li et al., 2018). In addition, childhood poverty is also associated with low socioeconomic status into adulthood, which continues the cycle of unhealthy habits and obesity (Li et al., 2018). Likewise, life stressors associated with economic hardship during childhood play a role in the development of obesity later in life (Li et al., 2018).

Another potential long-term consequence of childhood obesity is the development of diabetes. According to Huether and McCance (2017), obesity is one of the most recognized risk factors for diabetes. Currently, type 2 diabetes is on the rise in children, especially among those who are overweight or obese (Huether & McCance, 2017). Researchers have also identified a higher prevalence of diabetes among populations of low socioeconomic status (Heidemann,

Joseph, Kuchipudi, Perkins, & Drake, 2016). Lastly, individuals in poverty are at a greater risk of diabetes-related mortality (Saydah & Lochner, 2010).

Asthma. Asthma is a chronic inflammatory disorder affecting bronchial mucosa and is characterized by bronchial hyperresponsiveness, airway constriction, and reversible airflow obstruction (Huether & McCance, 2017). According to Gong et al. (2014), asthma is one of the most common chronic diseases affecting children. Recently, there was an estimated 6.8 million cases of asthma among children (Huether & McCance, 2017). More importantly, children of low socioeconomic status families are at an increased risk of having asthma (Gong et al., 2014).

Researchers have identified the role that social and environmental factors play in the pathogenesis of asthma (Gong et al., 2014). For example, allergen exposure, urban residence, air pollution, and tobacco smoke have all been identified as risk factors for asthma (Huether & McCance, 2017). Children living in economically disadvantaged communities are often exposed to air pollution and poor housing facilities (Gellci et al., 2019). Poor housing has been shown to exacerbate asthma symptoms due to increased exposure to moisture, pests, poor heating and ventilation symptoms, and dirty carpeting (WSDOH, 2013). Mold, a common allergen associated with asthma, has also been shown to be more prevalent in low-income households (WSDOH, 2013). In addition, tobacco smoke is another risk factor of asthma, and research has identified an association between increased smoking and lower socioeconomic status (WSDOH, 2013).

Inflammation of bronchial mucosa and airway hyperresponsiveness are processes mediated by the immune system (Huether & McCance, 2017). Social and environmental factors encountered during childhood affect the biologic pathways involved in the immune response. For example, socioeconomic status affects the glucocorticoid receptor gene NR3C1, which plays an important role in regulating inflammation (Farrell et al., 2018). Normally, cortisol binds to

glucocorticoid receptors, resulting in decreased inflammation (Farrell et al., 2018). Low socioeconomic status is associated with decreased NR3C1 gene expression and down-regulation of glucocorticoid receptor response elements (Farrell et al., 2018). Consequently, there are fewer glucocorticoid receptors available for cortisol binding, resulting in an over-activated inflammatory response (Farrell et al., 2018). This is problematic because pro-inflammatory cytokines are the cause of asthma attacks and corticosteroid medications are an important component of asthma treatment (Farrell et al., 2018). It is the negative emotional climate associated with low socioeconomic status that is believed to cause decreased NR3C1 gene expression (Farrell et al., 2018).

Individuals of low socioeconomic status are under chronic physiologic stress, which is associated with an increased risk of acute asthma exacerbation and poor disease prognosis (Miyasaka et al., 2018). The role of physiologic stress in asthma is understood through several complex neuroendocrine mechanisms (Miyasaka et al., 2018). One of these mechanisms involves interplay between the anterior cingulate cortex and the insula, regions of the brain that play a role in the emotional response associated with physiologic stress (Miyasaka et al., 2018). Signal changes in the anterior cingulate cortex and insula are associated with reduced pulmonary function and increased production of cells and mediators involved in the inflammatory immune response (Miyasaka et al., 2018). The HPA axis also plays a key role in the body's inflammatory processes and is mediated by physiologic stress (Miyasaka et al., 2018). Hormones involved in the HPA axis exert a stress response that is associated with allergic inflammation (Miyasaka et al., 2018). All of the above pathways reflect normal biological mechanisms that are negatively impacted by social and environmental factors associated with low socioeconomic status.

Health Education in Underserved School Systems

Mental Health. Understanding the health issues that underserved youth are predisposed to is important for identifying what resources have been implemented into current educational systems and what has been effective. By exploring the current literature, gaps have been uncovered and have revealed what needs to be done next for underserved youth in health education. First, schools are one of the most effective environments for promoting overall health, especially for underserved youth, as the school system may be the only resource underserved youth have access to for health concerns and education (Weare & Markham, 2005). Therefore, schools should consider implementing health-related topics into their curriculum. Studies have shown integrating health-related topics into science, math, and art classes to be effective for improving mental health and well-being, integrating asthma awareness into schools, and preventing obesity, which directly decreases the risk for diabetes during youth and adult life (Weare, 2017; Meiklejohn et al., 2012; Oude Luttikhuis et al., 2009; Pike et al., 2011).

Academic success, wellness, and risk behaviors are all interrelated and important to consider when discussing mental health. Poor mental and physical health can manifest into behaviors that may compromise health and influence academic achievement. By recognizing this correlation, a health-promoting school or a whole-school approach has been proposed and implemented by schools for decades, which aims to interconnect the physical, social, emotional, and environmental factors associated with health and well-being in a school setting (Thomas & Aggleton, 2016). Focusing on mental health, a whole school approach promotes mental health rather than targeted programs that aim to prevent mental illness. By doing this, schools change the connotation of mental health as a problem to be dealt with and redirects the focus of mental health as being a part of everyone's health and well-being (Weare & Markham, 2005).

The idea of health-promoting schools was first proposed by the World Health Organization's Health for all Strategy and the Ottawa Charter for Health Promotion, which took into consideration the physical, social, emotional, and environmental factors involved in a system-based setting (Thomas & Aggleton, 2016). From there, a whole school approach was developed utilizing a holistic model of health, which incorporates all dimensions of health and involves every facet of school, not limited to the classroom or curriculum. By using a whole school approach, those who struggle with mental health concerns are helped without being targeted, while those who may not be targeted for mental health concerns are still benefiting. In addition, because of the wide spectrum of mental illness, many individuals who do not evidently express a problem, but are at risk, are being addressed, whereas they may be left out in a targeted approach (Weare & Markham, 2005). There are several key elements involved in encouraging a whole school approach and changing the environment to think of mental health as part of overall wellness. Key elements include, but are not limited to, promoting self-esteem, providing personal support, guidance and counseling, and creating friendly relationships, all while establishing clear rules, encouraging autonomy, and involving everyone in the process, including students, peers, teachers, parents, and the broader community (Weare & Markham, 2005; Weare, 2017).

Programs that have successfully implemented whole school approach atmospheres have been shown to reduce specific mental health problems, including aggression, depression, impulsiveness, and antisocial behavior. More importantly, however, the programs have been shown to promote emotional and social well-being through communication and social skills, optimism, empathy, stress management, problem solving, and a positive self-concept (Thomas & Aggleton, 2016; Weare & Markham, 2005; Weare, 2017). Lastly, one must understand that a whole school approach will look different for every level of education, and the methods used

need to be sensitive to age, gender, and sociocultural factors. Therefore, when first implementing a whole school approach, it needs to be done incrementally and strategically, with strong leadership, well-trained staff, evaluation, clarity, and program fidelity (Weare, 2017).

In addition to a whole school approach for changing the stigma around mental health, there is also extensive research about the effectiveness of implementing mindfulness strategies into K-12 education as a way to reduce stress and promote mental health and overall well-being (Foody & Samara, 2018; Meiklejohn et al., 2012). Creating a more mindful environment can be done both indirectly, through instructing teachers in how to create a more mindful environment, and directly by having the teachers use mindful practices in their classrooms. Although an exact definition of the concept of mindfulness is lacking, mindfulness encompasses a state of awareness that comes from intentionally focusing on the present moment without judgement (Foody & Samara, 2018; Meiklejohn et al., 2012). Therefore, mindfulness techniques are believed to promote awareness and acceptance of the present, so that psychological controls over behavior, such as thoughts, feelings, and emotions, are minimized (Foody & Samara, 2018).

According to Meiklejohn et al. (2012), the direct implementation of mindfulness into both elementary schools and high schools reveals a spectrum of cognitive, social, and psychological benefits, including improved working memory, attention, academic and social skills, emotional regulation and self-esteem, as well as self-reported reductions in anxiety, stress, and fatigue. Mindfulness-based curricula are comprised of age-appropriate mind-body practices that include focused attention on breathing and sensation, awareness of thoughts and emotions, movement practices, and caring or kindness practices, which are skills developed over time. By achieving these skills, students learn to "...relate to their internal and external experiences in ways that are present-centered, objective, and responsive, rather than in ways that are past or

future-focused, subjective, or reactive" (Meiklejohn et al., 2012, p. 296). Mindfulness techniques have been shown to proactively target well-being among youth and improve behavior, coping skills, and mental health as a whole (Foody & Samara, 2018). While a number of programs have already been implemented, a need is still present for more research, training, and program development. Inherent in this need is a better understanding of how the implementation of mindfulness, across educational systems, benefits students' health.

Obesity. Another sector of health that can be addressed in a school setting is weight-management which is related to the discussion of mental health and wellbeing since obesity increases the risk for poor physical and mental health in childhood and adulthood (Robertson, Murphy, & Johnson, 2016). Weight-management education in a school setting is especially important for underserved populations, as they may have fewer resources to obtain healthy food options, fewer activities or areas to be active in, and reduced parental supervision of screen time, which has a positive correlation to weight gain in childhood (Schmidt et al., 2012). One of the biggest obstacles in reversing obesity rates in children is that parents either do not recognize their children are at risk or they do not think of weight gain as a health concern (Robertson et al., 2016). This obstacle is a crucial implication, however, because behavioral determinants of childhood obesity are heavily influenced by parental involvement (Oude Luttikhuis et al., 2009). Therefore, if parents are not addressing their child's risk for weight gain, it is all the more important that schools address this issue and spread awareness about nutrition, exercise, and reduced screen time.

Addressing obesity is not as straightforward as it sounds because of its multifactorial nature. Obesity is affected by genetic, behavioral, social, economic, and cultural factors, so there is not a single solution for reducing one's risk for acquisition, which makes finding positive

prevention strategies difficult. In 2009, the Cochrane systematic review published the results of 55 school-based intervention programs. Results suggested that interventions were most effective at ages 6-12 years, according to subgroup analysis (Oude Luttikhuis et al., 2009). Overall, the strategies found to be the most useful were part of a fully integrated curriculum that promoted the following: healthy eating, quality food choices, increased physical activity, positive body image, proactive environment, integration of cultural practices, decreased sedentary time, teacher support and the implementation of health promoting activities. All interventions were targeted at the home environment (Oude Luttikhuis et al., 2009; Robertson et al., 2016). While such strategies are not all-encompassing, they are a step in the right direction and have significant implications in weight-management among students, decreasing their risk for major health consequences later in life.

Asthma. Another health concern prevalent among students from low-socioeconomic backgrounds is asthma, which is one of the most common causes of school absenteeism (Pike et al., 2011). The integration of an asthma curriculum into elementary classrooms would not only benefit students with asthma but would spread awareness to all elementary students. In return, students would build their health literacy and better understand what their peers may be dealing with (Pike et al., 2011). Because schools often do not have the extra resources or budgets for extracurricular activities or educational opportunities, integrating asthma education into existing curriculum has been found to be the most feasible and effective (Pike et al., 2011). During the 2006-2007 school year, a pilot test was performed in 4th and 5th grade classrooms where a 15-lesson, asthma-based curriculum was integrated into subjects such as math, science, and the arts. Using pre-test and post-test evaluations and comparing the scores between experimental and control classrooms has been associated with a statistically significant increase in asthma

knowledge and awareness. In addition, teacher feedback was positive, indicating that previous lessons and skills were enhanced simultaneously to increase students' awareness about asthma. Although a small study with several limitations, Pike et al. (2011) shows the feasibility for integrating asthma awareness into school curricula and reveals positive implications for integrating other health-related, real-world topics into classrooms (Pike et al., 2011). Because asthma is one of the leading chronic diseases of school-aged children and is most prevalent among underserved populations, it is necessary to spread awareness about its presentation, triggers, and control (Pike et al., 2011). By spreading awareness, students may be more empathetic towards their peers who have asthma.

Future of Health Education for Underserved Students

Health education and its implementation into school systems has come a long way in recent decades. Working at the government, community, and individual levels, schools have started to implement new strategies into their curriculum, some of which include integrating mindfulness techniques or taking a whole school approach to improve the mental health and well-being of their students (Meiklejohn et al., 2012; Thomas & Aggleton, 2016). Teachers have begun integrating health-related topics into the curriculum to promote prevention and awareness regarding weight-management and asthma (Oude Luttikhuis et al., 2009; Pike et al., 2011). Lunchrooms have started offering healthier food choices, with an emphasis on a balanced diet. In addition, there are numerous online resources available from the Centers for Disease Control and Prevention (CDC), American Medical Association (AMA), American Academy of Pediatrics (AAP), and the U.S. Department for Health and Human Services (HHS), regarding mental health, obesity, and asthma, among other proactive and preventative health topics. As far as health education has come, it still has a long way to go, especially concerning underserved

schools and their students, who have a greater predisposition to the aforementioned health concerns with fewer resources to combat them (Fitzsimons et al., 2016; Weare, 2017).

The health professions students of Creighton University School of Pharmacy and Health Professions set out to tackle the gap in health education provided in schools by bringing a health fair and monthly educational sessions to an underserved elementary school, emphasizing health promotion and disease prevention (Begley, Haddad, Christensen, & Lust, 2009). Specifically, the elementary school's population was 99% African American, with more than half of the students at or below the poverty line. The sessions focused on health education, prevention, and overall wellness and were given to kindergarten through eighth grade students (Begley et al., 2009). In doing this, the students were exposed to health profession careers, while being educated and encouraged on healthy lifestyles. In addition, the health profession students were able to experience interacting with and educating children in a culturally sensitive manner. Survey results from the participating students after each educational session showed increased knowledge of various health topics and health profession careers, while the health profession students reported having a positive learning experience (Begley et al., 2009).

As demonstrated by the health profession students of Creighton University, creating health fairs and presenting educational sessions to students is one feasible approach to providing supplemental, health-promoting education to underserved youth that has shown positive results. In addition, this is an approach that does not require government policy change, teacher training, or curriculum integration. While little professional literature exists on the health fair and educational sessions approach, the potential impact on underserved youth is one worth exploring further, whether in a school or extracurricular setting. Childhood is an optimal time to address health risks, habits, and disease reduction and prevention in order to establish lifelong healthy

behaviors; the importance is even greater among underserved youth. Dedicating time, energy, and resources to one of the highest-need populations can empower them to be proactive about their health and to better cope with health issues they may already deal with.

Conclusion

Poverty remains a persistent problem in the United States, especially amongst children who are especially vulnerable (Dreyer et al., 2016). Numerous studies have identified a relationship between poverty and poor physical and mental health (Chen, 2004; Fitzsimons et al., 2016; Gong et al., 2014). These studies suggest several reasons for this health disparity, touching on social, environmental, and biological factors (Chen, 2004; Fitzsimons et al., 2016; Gong et al., 2014). The current literature on health education integration has shown great progress in implementing a whole school approach, which aims to improve mental health and overall wellbeing by making it relevant to everyone and involving all aspects of the school-setting (Thomas & Aggleton, 2016; Weare, 2017). Mindfulness techniques have also shown popularity in recent use as potential for reducing negative behaviors and instilling resilience among students (Meiklejohn et al., 2012). Lastly, integrating health-related topics into school curriculums has shown positive results, but the literature is not extensive and there is a need for more research (Begley et al., 2009). While health-education promotion has shown great improvement over recent decades, there is still a need to reach underserved populations that are at the highest risk for specific health conditions, including mental health issues, obesity, and asthma.

A community outreach project similar to the health fair conducted by Creighton University will be conducted at Central Baptist Church in St. Paul, MN, in an attempt to positively impact underserved Minnesotan youth by providing an educational opportunity outside of the school-system. A preventative health after-school curriculum will be developed

and targeted towards elementary and junior high students attending the weekly tutoring program. The project will include hands-on learning activities that teach students the importance of weight-management in regard to nutrition, exercise, and reduced screen-time, the risks of smoking and its contribution to asthma exacerbations, and mindfulness techniques for stress-reduction and relaxation. To increase the long-term impact and sustainability of this project, all curricula and demonstration tools will be donated to Central Baptist Church for future use.

Chapter 3: Methodology

Introduction

Since 1996, the Central Baptist Church after-school tutoring program has made it their mission to “support the academic, social, emotional, physical, and spiritual development of the youth we serve and bring entire families into contact with critical resources which support and sustain their well-being" (T. Hansen, personal communication, January 11, 2019). The Central Baptist Church after-school tutoring program serves the Midway community of the St. Paul School District and reports the majority of their students to attend either Hamline Elementary School or Murray Middle School. Growing up in school districts characterized by above average poverty rates, students are at an increased risk for the development of poorer health outcomes. Recently, the executive director of the after-school tutoring program expressed a need for additional resources pertaining to the topics of mental health, obesity, and asthma.

As a result, the purpose of this community service project is to evaluate the literature to develop a sustainable supplemental health education curriculum that has the potential to reduce poorer health outcomes among students exposed to poverty. With the permission of the executive director of Central Community Services Inc. (CCSI), all materials will be demonstrated at and donated to the Central Baptist Church after-school tutoring program (Appendix A).

Rationale for the Project

The association between low socioeconomic status in childhood and poorer health outcomes has already been established (Fitzsimons, Goodman, Kelly, & Smith, 2016; Li, Mustillo, & Anderson, 2018). Numerous studies have identified the benefits of implementing health education into school systems (Weare and Markham, 2005; Meiklejohn et al., 2012; Oude Luttikuis et a., 2009; Pike et al., 2011). While some schools have implemented preventative

health education into their curricula, not all schools have taken steps in this direction, especially in underserved areas (Weare, 2017). Therefore, there remains a need for supplemental health education for youth in underserved areas. The purpose of this community outreach project is to supplement the health education curriculum specifically of underserved youth in St. Paul, MN.

To provide supplemental health education to this specific population, the community service project leaders will create and present health kits to elementary students attending the Central Baptist Church after-school tutoring program. The program provides extended day learning activities for students in the St. Paul School District. The health kits will be focused on topics related to stress, obesity, and asthma, which are all conditions exacerbated by factors related to poverty. Through the implementation of sustainable and interactive health kits, the overall goal is to spread awareness about specific disease states and encourage healthy habits for prevention. By focusing on sustainability, the goal is to create a project with a long-term impact.

Population

The community service project will be implemented by its leaders at Central Baptist Church in St. Paul, MN. Since it was established in 1913, Central Baptist Church has demonstrated a long history of community service that aims to improve the lives of those in the local community. To expand its outreach into the Midway community of St. Paul, the church established CCSI in 2004. The church's after-school tutoring program is a function of CCSI, and its mission is to "support the academic, social, emotional, physical, and spiritual development of the youth we serve and bring entire families into contact with critical resources which support and sustain their well-being" (T. Hansen, personal communication, January 11, 2019).

The Central Baptist Church after-school tutoring program already has an established population made up of students from Hamline Elementary School and Murray Middle School,

which are both members of the St. Paul School District. Ramsey county, where the district is located, has a poverty rate of 13.9% (USCB, 2017). The percentage of students who qualify for free/reduced price lunch at Hamline Elementary and Murray Middle School are 80% and 62% respectively (Akyea, 2016). On a weekly basis, tutors work with a diverse group of 15 to 20 elementary students and 5 to 6 middle school students. Elementary students meet on Tuesday and Thursday afternoons, while middle school students meet on Wednesday afternoons. The community service project will focus on elementary students in the program, and all activities, scripts, and handouts used will be appropriate for that specific age range.

In addition to the student population, the after-school tutoring program also has an established population of tutors made up of volunteers from Central Baptist Church's congregation, as well as undergraduate students from Bethel University. The relationship between the tutoring program and undergraduate students from Bethel University has been established from the very beginning in 1996, making Bethel University a partner of Central Baptist Church, and later CSSI, for over 20 years (T. Hansen, personal communication, January 11, 2019). The tutors from Bethel University are mostly social work majors, where they have a program requirement of serving an underserved population. Social work majors can fulfill this requirement by tutoring at Central Baptist Church. By working with the students weekly, the tutors will become the presenting "wizards" of the following health kits, helping to make this community research project sustainable over time.

The community service project leaders have chosen to partner with Central Baptist Church because the mission of the program and services provided complement the vision and goals of the leaders. Because the Central Baptist Church after-school program is already well established, the leaders' intention is not to fill any organizational gaps. Rather, the leaders view

the organization as a partner in addressing the needs of underserved youth. The leaders would like to work within the program's already-established services and routines in order to provide supplemental health education. A meeting with the program's executive director was beneficial in directing the leaders toward specific areas of need within the population.

Project Plan and Implementation

The plan for the project is to provide supplemental health education to underserved elementary students attending the Central Baptist Church after-school tutoring program. Supplemental health education will be delivered through unique and interactive health kits which focus on specific conditions underserved youth may be predisposed to due to their economic status. In order to elicit change, the project will focus on sustainability, which will ultimately translate into long-term impact. Several steps will be taken in order to ensure sustainability. On the night of the presentations, health kits will be demonstrated by the community project service leaders, so the tutors can learn how to implement them into the program in the future. Tutors will also be encouraged to participate in the demonstrations by helping the students with the activities as they are demonstrated by the project leaders. Additionally, all materials for the project will be donated to Central Baptist Church afterwards. Detailed curriculum will be left within each health kit, so that it can continue to be utilized by the program for a sustainable, long-term impact.

Ethical implications related to the population were also considered when planning the project activities and curriculum. The community service project specifically focuses on students from low socioeconomic-status backgrounds, assuming they may not have as many resources to health education and reinforcement as those from higher socioeconomic-status backgrounds. However, the tools used and information shared will still benefit students from all backgrounds

and is by no means meant to segregate the students based on economic status. To avoid this, the instructions in each health kit have been written to address the general population.

Early in the development of this community service project, the leaders met with the executive director of the after-school tutoring program to help identify more specific needs of students in the program. The executive director emphasized the importance of considering students' attention spans when planning the project. To be considerate of time constraints and the students' level of engagement, the presentations will be spaced out over two nights of programming. The executive director also discussed the high prevalence of asthma among the students and a need for more information on topics related to asthma. Based on the needs of the population as revealed in the literature review and the program's recommendations, the leaders decided on creating health kits tailored to topics related to mental health, obesity, and asthma.

Mental Health. The literature review identified the importance of implementing mindfulness strategies for mental health. Therefore, the stress reduction kit for mental health will focus on mindfulness strategies, specifically deep breathing exercises (Appendix B). First, mindfulness will be defined as a state of being fully present and aware in the moment (Meiklejohn et al., 2012). Next, the children will be taught about how to implement breathing strategies as a way of practicing mindfulness and reducing stress. Resources from the University of California, Los Angeles and the University of California, Berkeley will be utilized for teaching and demonstrating mindful breathing strategies (Saltzman, Lester, Beardslee, & Pynoos, 2009; Winston, 2019; Appendix C). The handout titled *Deep Breathing for Children* includes a script for teaching mindful breathing exercises; the script can be read aloud and the exercises demonstrated to the children (Winston, 2019; Appendix C). The students will also be taught a breathing strategy described by the University of California, Berkeley which can be helpful in

the midst of stressful moments (Winston, 2019). In conjunction to the breathing exercises, the students will be taught about the importance of deep breathing in stressful situations, utilizing the same resources from the University of California, Los Angeles and the University of California, Berkeley (Saltzman et al., 2009; Winston, 2019; Appendix C).

Additionally, materials will be provided for a craft project in which students will have the opportunity to create sensory tools that facilitate mindfulness. Clear plastic bags will be filled with translucent hair gel, glitter, and beads to create a unique mindfulness sensory tool. The sensory tools will be made with the students on the night of the presentation, and step-by-step instructions and a list of materials for the project will be left in the health kit for future use.

Obesity. The literature review revealed that there is a higher prevalence of obesity among children of families of low socioeconomic status due to having fewer resources for health promoting behaviors, such as healthy food options, organized activities or areas to be active in, and parental supervision of screen time. Therefore, the nutrition kit for obesity will focus on making healthy food choices, being active, and reducing screen time (Appendix D). Resources from the National Heart, Lung, and Blood Institute of the U.S. Department of Health and Human Services *We Can! (Ways to Enhance Children's Activity & Nutrition)* program will be utilized for teaching and reinforcing healthy food choices, unique ways to be active, and an incentive program for reducing screen time (U.S. Department of Health & Human Services [HHS], 2013b). The handout titled *U R What U Eat* includes pictures of different food categories with nutrition descriptions and recommended daily portions, which can be used in conjunction with a food selection game where the students can practice making healthy choices (National Heart, Lung, and Blood Institute, 2013; Appendix E). There will also be a sugary beverage

demonstration where marked containers of sugar will represent different common beverages, allowing the students to visualize how much sugar their daily beverages actually contain.

In addition to the food selection game, the students will be able to use their new knowledge to play an active game in the gymnasium called "Go, Slow, Woah," which will represent the different types of food categories where they will run, walk, or stop based on the category each announced food belongs in. The game will reinforce making healthy food choices, while demonstrating how being active can be fun through games and activities. Lastly, the students will have the opportunity to set goals around screen time using a screen time log that they will be able to decorate and place stickers on as they reach their daily goals (Appendix F).

Asthma. The literature review identified asthma as one of the leading chronic diseases of low socioeconomic school-aged children, due to poor housing facilities, urban residence, and tobacco smoke exposure. Therefore, the asthma kit will focus on teaching students how to identify components of the respiratory system, define asthma as a condition that causes difficulty with breathing, and identify causes and appropriate treatments for an asthma episode (Appendix G). Resources from the Centers for Disease Control and Prevention National Asthma Control Program and Project ACCORD Asthma Education Program will be utilized for demonstrating and teaching concepts related to the prevention and management of asthma (HHS, 2013a; Minnesota Department of Health, 1998). The handout titled *Asthma FAST FACTS for kids* provides a basic definition of asthma, a list of potential causes of an asthma attack, and a summary of how and when to use different forms of asthma medications (HHS, 2013a; Appendix H). The handout can be used to provide students with additional information as they construct a breathing wheel that highlights things that make breathing difficult and things that make breathing easier (Minnesota Department of Health, 1998; Appendix H, Appendix K).

There will also be an asthma episode demonstration where students are provided the opportunity to compare normal breathing to asthmatic breathing by breathing through progressively smaller straws (Minnesota Department of Health, 1998; Appendix K).

In addition, students will be able to observe a kinesthetic model to view the respiratory process, identify respiratory system components, and understand the exchange of gases that takes place in the lungs. The handout titled *Your Respiratory System* provides students with a basic definition of respiratory system components and function (Sohail, 2015; Appendix J).

Potential Project

The most significant potential project barrier to implementing this community service project and its overall effectiveness, which aims to supplement the health education of elementary school-aged children from low socioeconomic backgrounds, is the timeframe in which the project can be demonstrated. Since the elementary school-aged tutoring sessions are only offered on Tuesdays and Thursdays for three hours a session during the school year, these are the only two days of the week that the project can be implemented, and the students that come on a weekly basis varies. Therefore, while the goal is to create a self-sustaining project that can be reused throughout the years, the Community Service Project leaders will only be able to demonstrate the health kits over the course of one week, and they cannot control who will be there, both students and tutors alike, or how the health kits will be demonstrated in future uses.

Another potential project barrier includes the limited attention span of the students and being able to keep their attention for the entirety of the health kit demonstrations. The executive director of the program emphasized this potential barrier and suggested presenting the health kits over the course of two sessions. Therefore, to accommodate the students' attention spans, each health kit presentation will be kept to between 15 to 20 minutes in length, with breaks between

each session, and spread out over the course of two separate tutoring sessions on different afternoons. By dividing up the presentations, the leaders will be able to interact with the students during the first session and give only one presentation on their first visit. Then, already having established a connection with the students, will present the other two presentations the following session.

The last potential project barrier to the overall effectiveness of the following community outreach project is that it serves only the students currently in Kindergarten through 5th Grade and enrolled in the EDL program at either Hamline Elementary School or Murray Middle School. Therefore, this project is limited by the demographics of the student population, which consists only of those who voluntarily participate in EDL from Hamline Elementary School or Murray Middle School. In the future, consideration should be made to expand this health curriculum to serve more schools in the Minneapolis-Saint Paul metropolitan area.

Project Tools

The design and creation of the health kits required the use of several outside resources and the purchase of specific materials. The format for each kit's curricula was provided by a science teacher at Bayfield High School (R. Erickson, personal communication, January 3, 2019). In addition, published internet resources provided informational handouts, activity instructions, pre-written scripts, and other useful information that was implemented into the health kits. All of the resources and materials used for each health kit are described and referenced in detail below.

Mental Health. The breathing exercises included in the mindfulness health kit were obtained from the University of California, Los Angeles and the Greater Good Science Center at the University of California, Berkeley (Saltzman et al., 2009; Winston, 2019; Appendix C). The

Deep Breathing for Children handout from the University of California, Los Angeles will be utilized to lead students in breathing exercises that can be implemented during stressful situations (Saltzman et al., 2009; Appendix C). The *Deep Breathing for Children* handout teaches children about the importance of abdominal breathing in delivering oxygen to the body (Saltzman et al., 2009; Appendix C). The script will be led by the community service project leaders during the initial presentation and will be included in the kit for future implementation (Appendix B).

Another breathing strategy from the University of California, Berkeley will be taught to the students (Winston, 2019). The strategy teaches students how to take an exaggerated breath to help calm down during particularly stressful moments (Winston, 2019). Students will be instructed to inhale through their nostrils for three seconds, hold their breath for two seconds, and exhale through their mouth for four seconds (Winston, 2019). The resource also teaches about how to focus on the sensation of the rise and fall of the chest and the feel of the breath through the nostrils (Winston, 2019). The resource from the University of California Berkeley emphasizes the importance of practicing mindful breathing strategies daily so that they can be easily implemented in moments of anxiety as they arise (Winston, 2019). The goal is to teach the students how to practice deep breathing in order to stay calm in stressful moments and reduce anxiety.

The materials included in the mindfulness kit will be clear plastic bags, translucent hair gel, colored beads, patterned duct tape, a tablespoon measuring spoon, and colorful glitter for the creation of the mindfulness sensory bags. The *Deep Breathing for Children* Handout will also be printed, laminated, and included in the kit for the tutor to use as a guide in leading the children through the deep breathing exercises (Saltzman et al., 2009; Appendix C).

Obesity. The tools used for the nutrition health kit include the *U R What U Eat* handout that outlines different food categories, nutritional information, and recommended daily portions, which will be used for a food selection game where the students will be able to pick different pictures of foods for their paper plates based on what they learn (HHS, 2013b; Appendix D, Appendix E). The same handout will be used for the active game "Go, Slow, Woah," which would be played in the gymnasium (Appendix E). Lastly, a screen time log will be used to help the students set goals around reducing screen time, where they will receive a sheet of stickers and can place one on each day they reach their goal (Appendix F).

The materials included in the nutrition kit will be laminated pictures of different types of food and paper plates for the food selection game, three marked containers of sugar and three empty beverage containers (pop can, apple juice bottle, and Gatorade bottle) for the sugary beverage demonstration, and the aforementioned handouts and stickers for the screen time log (Appendix E, Appendix F).

Asthma. The tools used for the asthma health kit include the *Asthma FAST FACTS for Kids* handout, *Your Respiratory System* handout, and the *Asthma Action Plan for Home and School* handout (HHS, 2013a; Sohail, 2015; Appendix G, Appendix H, Appendix I, Appendix J). All handouts are meant to be used in conjunction with the kit instructions to provide tutors with supplementary information when explaining what asthma is and how it influences the respiratory system. In addition, the asthma health kit will include the following worksheets: *Worksheet #5: The Breathing Wheel, Worksheet #6: Things That Can Make Your Breathing Difficult,* and *Worksheet #7: Things That Can Make Your Breathing Easier* (Minnesota Department of Health, 1998; Appendix K). The worksheets are to be used by students to construct a breathing wheel,

which highlights the most common causes and treatments of an asthma exacerbation (Appendix K). These materials can be taken home by students to use as a reference in the future.

The materials in the asthma kit will include two lung models to explain the respiratory system, straws and coffee stirrers to simulate asthmatic breathing, and copies of worksheets #5, #6, and #7 for each student to be able to construct a breathing wheel with a paper fastener (Appendix K). In addition, extra materials will be provided to replace and/or repair components of the lung models as needed.

Conclusion

The needs assessment of the Central Baptist Church after-school tutoring program concluded that students would benefit from supplemental health education on the topics of mental health, obesity, and asthma. Due to the financial status of the organization, the executive director of the Central Baptist Church after-school tutoring program would like to create materials that are sustainable and can be utilized by tutors on a semester to semester basis. Therefore, the community service project leaders decided to direct their efforts toward developing three health kits that will be demonstrated and donated to the Central Baptist Church after-school tutoring program. Each kit will include the instructions and materials needed to perform activities, games, and/or demonstrations. All supplemental health education materials were developed after conducting a literature review to identify the methods shown to be successful in a classroom setting. After discussing the contents of the health kits with the executive director of the Central Baptist Church after-school tutoring program, the leaders of the community service project were able to create a supplemental health education curriculum on the topics of mental health, obesity, and asthma, which are estimated to be the most impactful for the population of students Central Baptist Church serves in the after-school tutoring program.

Chapter 4: Discussion

Introduction

This community outreach project addresses the issues of mental health, obesity, and asthma in a population of underserved Saint Paul youth. Within the following chapter is a discussion of the community outreach project's outcomes. A summary of the results will be provided, along with a discussion in which the effectiveness and future sustainability of the newly developed preventative health education curriculum is evaluated. The limitations of the community outreach project will also be acknowledged. Finally, plans related to future project expansion and limitation reduction will be discussed.

Summary of Results

Underserved youth face unique healthcare concerns that are exacerbated by a lack of resources, awareness, and reinforcement of information. Because of the relationship between low socioeconomic status and poorer health outcomes in childhood (Fitzsimons et al., 2016; Li, Mustillo, & Anderson, 2018), the goal of the project was to supplement the health education of a small population of underserved youth in Saint Paul, MN, in order to help combat the negative health outcomes that may be associated with their socioeconomic status.

A community outreach project addressing healthcare concerns in underserved youth is necessary to address and help alleviate the widespread health disparity present among children living in poverty. Such a project is especially necessary in Minnesota where approximately 150,000 children are living in poverty (MSDC, 2018). The project members chose to serve students attending Hamline Elementary School and Murray Middle School specifically because of the school district's high poverty rate. The need for health education, especially among the aforementioned population of underserved youth, is great due to their increased risk of having

poorer health outcomes throughout their lifetime (Huether & McCance, 2017; Kelishadi et al., 2018; Li et al., 2018; Miyasaka et al., 2018)

Partnering with Central Baptist Church in Saint Paul, MN, the community service project was implemented on two separate nights during the regular after-school tutoring program hours. On the first night, the project members began by introducing themselves and talking about the physician assistant profession, as well as learning something unique about each student to establish a level of trust and rapport. The asthma health kit was presented on the first night, which included a lung model demonstration, a straw breathing exercise, and the construction of breathing wheels (Appendix G-K). Asthma is one of the most common chronic diseases among children, with an increased risk among those of a lower socioeconomic status due to poor housing facilities and air pollution, including increased exposure to tobacco smoke (Gellci et al., 2019; Gong et al., 2014; Huether & McCance, 2017). There were five students in attendance ranging from kindergarten to fifth grade and three tutors who were undergraduate students from Bethel University. The classroom coordinator and executive program director were also present to observe the delivery of the presentations and the participation by the students. The presentation was approximately 30 minutes long, during which time the students appeared engaged and asked appropriate questions. Every student participated in at least one learning activity and demonstrated some level of understanding, either through answering questions or repeating what had been taught in their own words. The students were excited to bring their craft activities home to show their families, which will continue to solidify their understanding of the information.

On the second night, the mindfulness and nutrition health kits were presented. Each kit took approximately 30 minutes. There were four students in attendance, ranging from

kindergarten to fifth grade, as well as six tutors, the classroom coordinator, and the executive program director. First, the mindfulness kit was demonstrated by defining mindfulness and guiding everyone in deep breathing exercises, followed by the creation of sensory bags (Appendix B-C). Stress, depression, and emotional issues have all been associated with socioeconomic status, with children of low socioeconomic status experiencing more negative emotional states than children of higher socioeconomic status making (Chen, 2004; Fitzsimons et al., 2016). Mindfulness has been shown to proactively improve behavior, coping skills, and mental health among youth (Foody & Samara, 2018). The students enjoyed participating in the activities and demonstrated an understanding of how to utilize mindfulness techniques on their own by describing situations at home and at school when they could practice deep breathing exercises. The tutors were encouraged to continue using these exercises before each tutoring session to help the students focus and solidify their mindfulness practices.

Lastly, the nutrition kit was presented, which included a food selection game, a sugary beverage demonstration, a discussion on screen time, and an activity played in the gymnasium (Appendix D-F). Obesity in childhood is multifaceted, with children of low socioeconomic status having the highest risk due to limited access to nutritious foods, fewer public parks or areas for activity, and increased exposure to life stressors both in utero and early childhood (Chen, 2004; Kelishadi et al., 2018; Li et al., 2018). The students enjoyed picking out foods they eat on a regular basis and going through the "U R What You Eat" chart (Appendix E). The students were encouraged to pay special attention to the lesson since they would need to remember some of the food groups for an activity in the gymnasium later. Playing "Go, Slow, or Woah", a rendition of "Green Light, Red Light", was a great way to solidify what was taught while having fun with both the students and tutors. During the session, the tutors obtained practice with directing the

game and were encouraged to utilize the game at future tutoring sessions to promote healthy activity and good food choices on a weekly basis. Each of the health kits were well received by the students, tutors, classroom coordinator, and executive program director. The classroom coordinator expressed interest in incorporating these activities into future tutoring sessions, and the health kits were left at Central Baptist Church for future demonstration purposes.

When reflecting on the project after both nights, the project members agreed that the presentations were simple enough for the younger students to understand, but detailed enough for the older students to appreciate. While there were only six students total present throughout the two nights, each one demonstrated some level of understanding by answering questions and offering suggestions on how they could implement what they learned in the future. Each of the students also gave the project members their full attention. The students responded positively to the chosen health topics and were genuinely interested in the physician assistant profession. The executive director responded with the following feedback: "Thank you again for your thoughtful presentations. I loved how engaged the kids were and how helpful the information you shared was for them in practical ways. It's not easy to make scientific concepts accessible and interesting to children. I love that these kits include good content, engaging activities, and real life health information that will impact their lives. And we get to have the kits to use again and again!" (T. Hansen, personal communication, April 28, 2019).

After presenting the health kits, it was evident that many of the students had been exposed to classmates or siblings with asthma, mental health conditions, and obesity through their comments and understanding of the different health topics, which was consistent with the literature review findings of the prevalence of such health outcomes among underserved youth. However, it was evident the students had limited prior health education on how to prevent or

manage these specific health outcomes. For example, none of the students had ever heard of mindfulness techniques or practiced deep breathing exercises before, which have been implemented into K-12 education as a way to reduce stress and promote mental health and overall well-being (Foody & Samara, 2018; Meiklejohn et al., 2012). Therefore, the findings were consistent with the literature review being that supplemental health education among underserved youth is necessary in the prevention and management of negative health outcomes that many underserved youth may be predisposed to due to their socioeconomic status.

Limitations

The project members encountered several limitations while creating preventative health education kits for the Central Baptist Church after-school tutoring program. The project members only created health curriculum for three health conditions, though children living in poverty are exposed to many other health disparities. Additionally, due to the challenges associated with creating a cohesive, age-appropriate curriculum, the project members designed the health kits for elementary students only, though Central Baptist Church also provides tutoring for middle school students. Even among the elementary students, there was a significant age range, which made student reception to the material variable at times. The project members tried to write curriculum and organize activities that would be appropriate for the majority of elementary aged students, and for the most part, the students were engaged and well-pleased. However, at times the gap between kindergarten and fifth grade was evident. For example, some of the older students appeared to be less interested in some activities than the younger students.

The project members also encountered several limitations while demonstrating the preventative health education kits at the Central Baptist Church after-school tutoring program. As predicted, the students who attended the program both nights differed slightly, so some

students missed out on certain aspects of the demonstrations. Students who only attended one night of the session only received half of the intended educational material, while those who attended both nights received the full educational experience. In addition, student attendance was much lower than anticipated, with only four to five students in attendance per session. In prior years, the program hosted up to 20 students per session. Although we were unable to reach quite as many students as expected, the small group size promoted the facilitation of one-on-one learning. Another limitation to the project involves variation in tutor participation and attendance. To our surprise, tutor attendance was much higher than anticipated, with three to six tutors present per session. However, only one tutor was present for both sessions. For this reason, tutors who were present one day were able to see how the kits for that night were demonstrated, but missed the opportunity to learn how the other health kits were demonstrated. Overall, having additional tutors present greatly benefited the project in terms of content delivery and reinforcement of understanding, as each student was able to have plenty of help completing the projects and staying engaged in the activities.

Partnering with Central Baptist Church in Saint Paul, MN, this community service project addressed stress reduction, obesity prevention, and asthma management in an underserved youth population. It must be emphasized that lack of education is not the only contributing factor to poorer health outcomes in underserved populations. While our educational materials are able to have a significant impact, they are not meant to be comprehensive. For such reasons, education materials were targeted to a specific population that statistically expressed a need for health interventions. Despite several limitations, there were still many successes that allowed the group to have a positive impact on the population. For example, students were taught self-care techniques to improve their health. Since the majority of underserved students attending either

Hamline Elementary School or Murray Middle School are considered to be underserved, the group created materials that promote healthy behaviors rather than healthy financial decisions. In doing so, students were able to learn the skills needed to take control of their own health.

Further Projects

Evaluation of both the limitations and successes of the community outreach project have enabled the project members to identify several areas for improvement. At the start of the project, the group hoped to provide supplemental health materials, in the form of three sustainable health kits, to underserved Saint Paul youth. As the populations of Hamline Elementary School and Murray Middle School continue to exhibit high poverty rates, the need for preventative health education is especially warranted. The project members were successful in demonstrating the health kits and addressing the lack of education regarding stress reduction, obesity prevention, and asthma management. In return, the project members strengthened a relationship between Central Baptist Church, Hamline Elementary School, Murray Middle School, and Bethel University.

As discussed previously, the group did identify some limitations of the project, including curriculum content, student reception of the materials, and the ability to address only three specific health conditions. From the successes and limitations mentioned previously, come suggestions for future uses and improvements. The project members hope the health kits will continue to be demonstrated to future participants of the Central Baptist Church after-school tutoring program multiple times a year. However, Bethel PA students and/or Central Baptist Church tutors are encouraged to adapt the existing curriculum to fit the needs of the changing population. Since the health kit materials were specifically tailored to suit an elementary audience, the program may include the addition of materials better suited for Murray Middle

School students. Future Bethel PA students may consider expanding the curriculum to cover other health concerns that are prevalent among underserved youth besides those that have already been covered.

Fortunately, continuation of the project is fairly simple and not many additional efforts are necessary on behalf of the tutors at Central Baptist Church. The executive program director and several of the tutors witnessed the demonstration of the health kits, so they will be able to follow the curriculum and scripts easily in the future. The program now has access to all of the materials, since the kits were donated and stored at Central Baptist Church. Extra materials and supplies were left over in each of the kits so that the program would not have to immediately purchase additional supplies. For the most part, the project is highly self-sustainable and can be further adapted by the program as necessary.

Conclusion

In summary, the community service project explored the association between poverty and childhood health. In general, poverty has been associated with negative health outcomes (Chaudry & Wimer, 2016). A study of the literature found that children growing up in poverty are especially vulnerable to poor health because of early exposure to disease-contributing factors associated with low socioeconomic status (Chaudry & Wimer, 2016). A study of poverty rates among children in Minnesota specifically alerted the group to a high need for health education right here in the state. Specifically, the populations of Hamline Elementary School and Murray Middle School in Ramsey county were shown to exhibit high poverty rates, further emphasizing the need for health education among underserved youth (Akyea, 2016).

The literature review identified many health concerns among children living in poverty as a result of interrelated social, environmental, and biologic factors. The project members chose to

focus specifically on how poverty predisposes children to stress, obesity, and asthma in order to address such health issues in underserved youth. To alleviate specific health disparities, the group chose to partner with the after-school tutoring program conducted by Central Baptist Church. The decision to provide health education here was intentional. For many students living in poverty, the school system is their only resource for health education (Weare & Markham, 2005). Though many schools have integrated health education into their curricula, there remains a gap among underserved school systems (Fitzsimons et al., 2016; Weare, 2017). The opportunity to address the gap in health education came through the partnership between Central Baptist Church, Hamline Elementary School, and Murray Middle School.

After learning how poverty predisposes children to stress, obesity, and asthma, the group created mindfulness, nutrition, and asthma prevention health kits targeted specifically for an elementary audience. Each health kit provides helpful resources and fun activities for students to learn how to best prevent and manage the aforementioned conditions. Specific curriculum was created for each health kit to enable tutors to continue providing health education demonstrations in the future. The health kits were demonstrated on the two nights in which elementary students attend the program. After conducting the project, the group identified several limitations including curriculum content, student responsiveness, and student and tutor variability. Once the successes and limitations of the project were analyzed, a discussion of potential further projects was conducted. Future groups may consider adapting the curriculum for middle school students or adding curriculum for additional health topics.

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APPENDIX A

Central Community Services, Inc. (CCSI) Approval

420 Roy Street North
Saint Paul, Minnesota
55104

651-470-9697
www.ccsimn.com

January 8, 2019

To Whom It May Concern:

On behalf of After School @ Central Tutoring Program, I, Terri Hansen, give permission to Bethel University Physician Assistant students, Anna Ehnstrom, Ellie Hoopman, and Caitlin Olson, to conduct their Master's Community Service Project at our site. I grant permission to have the students in the tutoring program participate in a hands-on learning experience under the supervision of myself as director of said program, and Amalia Canepa-Green, classroom coordinator.

We are excited to see what the Bethel students will bring to this project. We look forward to its completion in April.

Sincerely,

Terri L. Hansen
Executive Director of CCSI
Program Director of After School @ Central

APPENDIX B

Health Mentors: Mindfulness Script

Health Mentors

MINDFULNESS

Tips for Health Mentors Program Advisors

It is important that the students that are presenting have the proper training; at least a one-day refresher course would be wise if the presentations take place long after initial training course.

*These kits are **not** always left completely ready for use—it would be a VERY good idea to get them a little early to not only have time to make sure you have everything you'll need for the demonstrations but also an excellent chance for presenting student "wizards" to familiarize themselves with the kits again.*

Demonstrations in the Health Mentors kits require products that may need to be refilled. Some of those items include handouts, craft supplies, etc. Make sure you have these items if you plan to do those demonstrations.

** If you have any questions, comments, and/or suggestions please contact Anna Ehnstrom, Ellie Hoopman, or Caitlin Olson. We would like these kits to be as useful to teachers as possible, so we are always looking for ways to improve them.

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****MOST IMPORTANTLY! PLEASE KEEP THESE KITS IN THE BEST CONDITION YOU CAN. IF EQUIPMENT IS BROKEN OR NOT WORKING PROPERLY-LET SOMEONE KNOW!****

Health Mentors: ***Mindfulness***

This Health Mentors kit has been designed to demonstrate and teach concepts involving mindfulness for stress and anxiety reduction. A script is provided for demonstrating mindful breathing strategies. The script utilized for teaching deep breathing was obtained from the University of California, Los Angeles. Additional mindful breathing techniques and information was obtained from the Greater Good Science Center at the University of California, Berkeley. This kit also includes a craft activity in which students can make "sensory bags" that assist in creating a mindful environment.

As with each of the Health Mentors kits, there are a few basic concepts we hope to convey to the students. Below is a list of those basic concepts.

Mindfulness Education Core Concepts

- Mindfulness is a state of being fully present and aware in the moment.
- Breathing strategies can be used to practice mindfulness and reduce stress.

Mindfulness Quick Script

Defining mindfulness.
Students discuss what it means to be mindful

Practicing mindfulness techniques.
Students practice mindful breathing exercises

Creating a mindful environment.
Students create "sensory bags"

Additional Materials

- "Deep Breathing for Children" Handout
- Materials for sensory bags: clear plastic bags, clear hair gel, colored beads, duct tape, ¼ cup measuring spoon, glitter

References:

Saltzman, W., Lester, P., Beardslee, W., & Pynoos, R. (2009). Deep breathing for Children. University of California, Los Angeles. Retrieved from the University of California, Los Angeles website http://nfrc.ucla.edu

Winston, D. (2019). Mindful breathing. Retrieved from the Greater Good Science Center at UC Berkeley website: http://ggia.berkely.edu

The Health Mentors Mindfulness kit was designed by Anna Ehnstrom, Ellie Hoopman, and Caitlin Olson of the 2020 Bethel University Physician Assistant Program.

Core Concept #1: Defining and Practicing Mindfulness

Materials:

1. "Deep Breathing for Children" Handout

Method:

1. First, discuss with the students what it means to be mindful. Ask students what they think "mindfulness" means and allow time for a response.
2. After allowing time for discussion, tell the students that mindfulness is a practice of being fully present in the moment and is helpful in reducing stress and anxiety. Educate students that one way to be mindful is to focus on their breathing.
3. Tell the students to take a seat and close their eyes. Then, lead the students in practicing deep breathing for mindfulness by following the instructions provided in the "Deep Breathing for Children" Handout.
4. Teach the students another mindful breathing technique we refer to as "3-2-4" breathing. Tell the students that during particularly stressful moments, it can help to take an exaggerated breath to help calm the mind and body down. Instruct students to take a deep breath in through their nostrils for 3 seconds, hold for 2 seconds, and exhale through their mouth for 4 seconds.

Explanation: Mindfulness is a practice of being fully present in the moment. When we feel ourselves starting to get worried or anxious, we might notice that our mind gets carried away by all of our stressful thoughts. We start to get distracted by our worries. Mindfulness helps us stay calm in those moments of anxiety rather than become overwhelmed by them. One way to be mindful is to focus on your breathing. When we focus on our breathing, it serves as an anchor for our mind. Instead of being carried away by our anxious thoughts, we can focus on our breathing to help us stay calm. We can practice mindful breathing every day so that it starts to get easier and we know how to practice it in a moment of anxiety.

Let's start by practicing deep breathing. You can all take a seat and close your eyes. During this practice, we are going to focus on belly breathing. Start by taking a few, slow, deep breaths from your belly. When you take a deep breath, let your tummy push out as your lungs fill with air and naturally let it go, as the air leaves the lungs. Taking a deep breath from your belly helps when you are feeling stressed. [In a soothing voice, read the "Deep Breathing for Children" script.].

Next, let's practice an easy mindful breathing practice that you can remember to use when you are feeling stressed; this exercise is called "3-2-4" breathing. Start by taking a deep breath in through your nostrils for 3 seconds. Then, hold your breath for 2 seconds. Finally, breathe out through your mouth for 4 seconds. If you are having trouble breathing out think of it like you are blowing out a birthday candle.

Core Concept #2: Sensory Bags for a Mindful Environment

Materials:

1. Clear plastic bags
2. Clear hair gel
3. Colored beads
4. Duct tape
5. Tablespoon measuring spoon
6. Glitter

Method

1. Hand each of the students two clear plastic bags each.
2. Help the students squeeze hair gel into ONE of the bags until it is about half full.
3. Have the student use the ¼ cup measuring spoon to scoop the beads into the plastic bag with hair gel.
4. Allow the student to select a choice of glitter and sprinkle glitter into the bag containing the beads and hair gel.
5. Close the clear plastic bag and use duct-tape as a seal.
6. Place the bag containing the gel, glitter, and beads, into the second empty plastic bag. Double-bagging will help ensure that all the contents stay in the bag.
7. The "sensory bag" is now complete!

Explanation: You can use your sensory bags whenever you find yourself in a moment of stress and feel like you need to calm down. You must remember to be gentle with the sensory bags and careful not to pop them. If you press too hard on the bags, you might see the gel and other contents come out.

APPENDIX C

Deep Breathing for Children Handout

Deep Breathing for Children

Use this script as a tool for helping your child relax during stressful or challenging situations.

Note to parents: Sit down with your child and explain that you're going to learn a new type of breathing: deep breathing (or abdominal breathing). Ask them to take a few slow, deep breaths and let their tummy push out as their lungs fill with air, and naturally let it go out, as the air leaves their lungs.

In a soothing voice, read the following script:

We are going to take several deep breaths.

In, 1, 2, 3, out 1, 2, 3.

Breathe in through your nose and out through your nose. If breathing out through your nose is hard, you can exhale through your mouth.

In 1, 2, 3, out 1, 2, 3. In 1, 2, 3, out 1, 2, 3.

Notice your breathing. Where does the air go once it is inside your body? Is the air coming into your chest? Or is it coming down into your belly?

In 1, 2, 3, out 1, 2, 3. In 1, 2, 3, out 1, 2, 3.

Try moving the air all the way to the bottom of your lungs down into your belly. You can put your hand on your stomach. When you are breathing deeply into your belly, your hand should rise and fall as you inhale and exhale.

In 1, 2, 3, out 1, 2, 3.

When you breathe deeply, the air comes deeper into your lungs and delivers fresh oxygen to your muscles all over your body.

In 1, 2, 3, out 1, 2, 3.

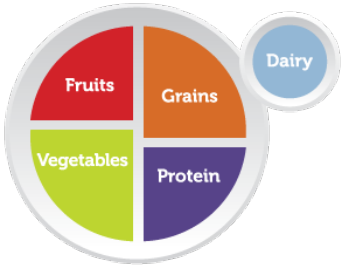
Keep breathing in slowly and breathing out slowly.

In 1, 2, 3, out 1, 2, 3.

Continue breathing deeply into your abdomen for five more refreshing breaths.

APPENDIX D

Health Mentors: Nutrition Script



Health Mentors NUTRITION

Tips for Health Mentors Program Advisors

It is important that the students that are presenting have the proper training; at least a one-day refresher course would be wise if the presentations take place long after initial training course.

*These kits are **not** always left completely ready for use—it would be a VERY good idea to get them a little early to not only have time to make sure you have everything you'll need for the demonstrations but also an excellent chance for presenting student "wizards" to familiarize themselves with the kits again.*

Demonstrations in the Health Mentors kits require products that may need to be refilled. Some of those items include food pictures, stickers, and containers of sugar. Make sure you have these items if you plan to do those demonstrations.

** If you have any questions, comments, and/or suggestions please contact Anna Ehnstrom, Ellie Hoopman, or Caitlin Olson. We would like these kits to be as useful to teachers as possible, so we are always looking for ways to improve them.

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****MOST IMPORTANTLY! PLEASE KEEP THESE KITS IN THE BEST CONDITION YOU CAN. IF EQUIPMENT IS BROKEN OR NOT WORKING PROPERLY – LET SOMEONE KNOW!****

Health Mentors: ***Nutrition***

This Health Mentors kit has been designed to demonstrate and teach concepts involving nutrition and the health benefits of an active life. The information for this demonstration was obtained from the National Heart, Lung, and Blood Institute's *We Can!* educational program. This script describes several demonstrations and learning objectives, however the script is certainly not meant to limit methods of presentation. Be creative and feel free to modify the presentations in any way.

As with each of the Health Mentors kits there are a few basic concepts we hope to convey to the students. Below is a list of those basic concepts.

Nutrition Education Core Concepts

- Nutrition is key to our overall health and growth
- Being healthy includes eating well and being active
- Reducing screen time can help us be more active

Nutrition Quick Script

Making Healthy Choices for a Healthy Life
Sugary Beverage Demonstration
Food Selection Game

Exercising Gives Us Energy
Go, Slow, and Woah Game

Less TV and More Activity
Screen Time Log

Additional Materials

- Snack Recipe Cards
- "U R What U Eat" Handouts
- Screen Time Log

References:

U.S. Department of Health & Human Services [HHS]. (2013, December 09). Welcome to We Can! Ways to Enhance Children's Activity & Nutrition. Retrieved from the National Heart, Lung, and Blood Institute website: http://www.nhlbi.nih.gov

Core Concept #1: Eat Right!

Purpose: To demonstrate the importance of making healthy choices for keeping a healthy weight and a good energy balance in order to stay active, learn, and grow.

Materials:

- Food Pictures
- Paper Plates
- "U R What U Eat" Chart
- 3 Marked Containers of Sugar
- Empty Pop Can
- Empty Apple Juice Bottle
- Empty Gatorade Bottle

Method:

1. Spread the food pictures all over the table and hand each student a paper plate.
2. Ask the students to select all the foods they eat on a normal day.
3. Using the "U R What You Eat" chart explain each food group, what it does to your body, and how much you should be eating of it every day.
4. Now give the students an opportunity to re-pick foods for their plates based on what they just learned. Encourage them to make these choices at home and at school.
5. Next, show the students the three marked containers of sugar. Explain how much sugar is in each one and ask them what drink they think each container of sugar represents.
6. Show them the corresponding empty pop can, apple juice bottle, or Gatorade bottle as they guess. Explain how sugar and calories affect our bodies using the explanation below.

Explanation: Keeping a healthy weight and energy balance depends on how many calories we eat and drink and how many we burn off when we are active. Calories are a source of energy, and the more sugar there is in certain foods and beverages, the more calories they have too. When we take in the same amount of energy (calories consumed) as the amount of energy we use up (calories burned), then we stay the same weight. However, when we take in more energy than the amount of energy we use up, then we gain weight. Therefore, we need to make sure we are putting good sources of energy into our bodies and staying active to use all the energy up.

Core Concept #2: Be Active!

Purpose: To demonstrate that being active can be fun through games and activities.

Materials:

- "U R What U Eat" Chart

Method:

1. This game is meant to be played in succession to "Core Concept #1: Eat Right!" and cannot be played out of sequence due to the explanation about different food groups.
2. This is a modified game of "Red Light, Green Light" using the "Go, Slow, Woah" categories of the "U R What U Eat" chart.
3. Have the students line up in the gym against one wall. Explain that "Go," "Slow," and "Woah" correspond to "Green," "Yellow," and "Red." (Green = Go = Run, Yellow = Slow = Walk, and Red = Woah = Stop).
4. Next, remind them of the foods in each category. Try to pick common foods that would be easily remembered. (Example: Banana = Go, Pancakes = Slow, French fries = Woah).
5. Start the game and if anyone goes the wrong speed with a given food example they go back to the starting line. Whoever makes it to the other end of the gym first wins!

Explanation: Being active is just as important as making healthy choices. Try to get 60 minutes of physical activity every day. This can be done by going up and down the stairs, playing ball, biking, swimming, walking, jump roping, and playing active games with friends and family.

Core Concept #3: Reduce Screen Time!

Purpose: To make goals to reduce screen time and find other activities to do instead.

Materials:

- Screen Time Log
- Sheet of Stickers

Method:

1. Ask the students what kinds of screens they play on, where they play on them, and for how long at a time. This will generate a discussion about the different kinds of screens.
2. Use the explanation below to explain why screen time is also a part of energy balance.
3. Give each student a screen time log and help them set screen time goals. This includes making a screen time limit every day, as well as making a list of other activities they could do that does not require a screen.
4. Once the students have completed making their goals, have them pick out a sheet of stickers and explain that every day they reach their goal they can put a sticker on it.
5. Encourage the students to hang their logs up at home and share them with their parents.

Explanation: "Screen time" comes in many different forms, including television screens, computer monitors, iPads, phones, and other video game devices. While screens are not a bad thing, they should be used in moderation. Health experts say that screen time at home should be limited to two hours or less per day. When we are busy watching a screen, we are not moving around or being active. Therefore, it is easy to get out of balance with our energy, and we end up putting more in than we use up. Tracking our screen time can help us stay active and healthy.

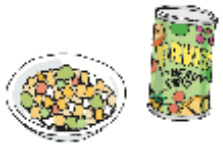
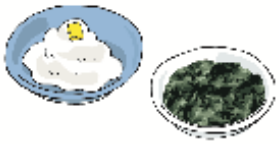
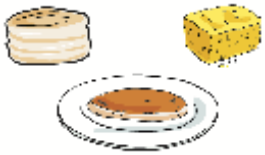
APPENDIX E

U R What U Eat Handout

U R What U Eat

Food supplies the nutrients needed to fuel your body so you can perform your best. Go, Slow, Whoa is a simple way to recognize foods that are the smartest choices.

- "**Go**" Foods: Eat almost anytime (Most often) — they are lowest in fat, added sugar, and calories
- "**Slow**" Foods: Eat sometimes (Less often) — they are higher in fat, added sugar, and/or calories
- "**Whoa**" Foods: Eat once in a while (Least often) — they are very high in fat and/or added sugar, and are much higher in calories

Food Groups	GO	SLOW	WHOA
Fruits Whole fruits (fresh, frozen, canned, dried) are smart choices. You need **2 cups** of fruit a day. 1 cup is about the size of a baseball.			
Vegetables Adding fat (butter, oils, and sauces) to vegetables turns them from Go foods to Slow or Whoa foods. You need **2 ½ cups** of vegetables a day. Dark green and orange vegetables are smart choices.			
Grains Try to make at least half of your servings whole grain choices and low in sugar. An ounce of a grain product is 1 slice of bread, 1 cup of dry cereal, or ½ cup of cooked rice or pasta. You need about **6 ounces** a day.			
Milk Milk products are high in vitamins and minerals. Fat-free and low-fat milk and milk products are smart choices. About **3 cups** are needed each day; 1 cup of milk, 1 cup of yogurt or 1 ½ ounces of natural cheese count as 1 cup.			
Meats & Beans Eating **5 ½ oz.** a day will give you the protein, vitamins and minerals you need. Limit meats with added fat. Smart choices include beans (¼ cup cooked), nuts (⅓ oz.) and lean meats (1 oz.) baked or broiled.			

The amounts of foods recommended per food group are based on a 2,000-calorie diet, the approximate number of calories for most active boys and girls ages 9-13. U.S. Department of Agriculture, Center for Nutrition Policy and Promotion.

we can! Ways to Enhance Children's Activity & Nutrition

National Institutes of Health

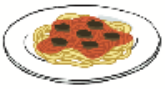
Sweets and Snacks

The foods below are snack-type foods. The "Slow" and "Whoa" foods are higher in fat, added sugar, and/or calories and need to be limited so you do not eat more calories than your body needs. Remember, if you eat sweets and snacks, eat small amounts.

GO	SLOW	WHOA
 For "Go" snacks, select foods from the "Go" column in the food groups section.		

Combining Food Groups

Foods we eat are usually a mixture of ingredients from the different food groups. A food can turn from a "Go" into a "Whoa" based on the ingredients used. The examples below contain ingredients from the milk products, grains, vegetables and meat groups – some "Go," some "Slow," and some "Whoa." Foods served in restaurants often use "Whoa" ingredients.

Combined Foods	GO	SLOW	WHOA
Pizza	 English muffin pizza with low-fat cheese (using ½ English muffin)	 Regular or classic veggie pizza: 1 slice from a medium pizza	 Deep dish pepperoni pizza: 1 slice from a medium pizza
Pasta	 Pasta with tomato sauce and vegetables – 1 cup	 Macaroni and cheese – 1 cup	 Pasta with sausage – 1 cup

Move More

To keep at a healthy weight, energy in (foods you eat) must balance with energy out (how much you move). Try to get 60 minutes of physical activity every day. Move more, take the stairs, play ball, bike, swim, walk, and find active games you enjoy. Have fun!

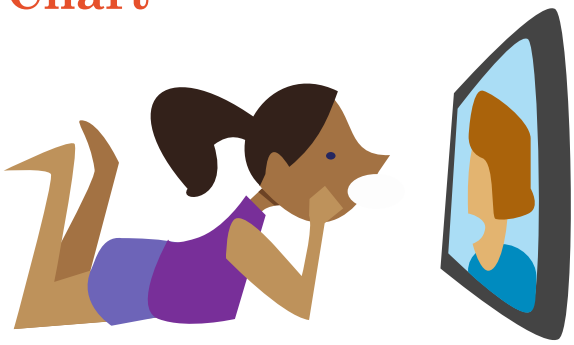
For more information, visit the *We Can!*™ Web site at **http://wecan.nhlbi.nih.gov**. *We Can!* is a national education program promoting healthy weight for children from the National Institutes of Health.

APPENDIX F

We Can! Screen Time Chart

We Can! Screen Time Chart

Fill out the ***We Can!*** Screen Time Chart to see how much time your family spends in front of a screen. Keep one chart for each person.



Be sure to include time spent with cell phones and other hand-held video or gaming devices.

Post the chart where it's easy for everyone to see and use. Good places are near the family TV, by the computer, or on the refrigerator.

If screen time for each person is less than 2 hours a day, you're doing great! If it's 2 hours or more, then it's time to move more. Find ideas to get your family moving in the ***We Can!*** Family Guide. Take a look at:

- ***We Can!*** Parent Tips: Help Your Kids Reduce Screen Time and Move More
- ***We Can!*** Parent Tips: Be Active and Have Fun

You can print more screen time charts from the ***We Can!*** Web site at http://www.nhlbi.nih.gov/health/public/heart/obesity/wecan/downloads/screen-time-log.pdf.

How to fill in the *We Can!* Screen Time Chart

To fill in your family's screen time chart— For each day, write the hours spent for each type of screen.

- Then add the hours for each day. Write the total in the "Daily Total" column.

See the sample chart below.

We Can! Screen Time Chart — Sample Chart

Name: Billy **Dates:** 6/4 – 6/10

	TV	Video Games	Hand-held Devices	Computer	Daily Total
Monday	2 hours	1 hour		1 hour	4 hours
Tuesday	3 hours	1 ½ hours		1 hour	5 ½ hours
Wednesday	1 hours	1 hour	2 ½ hours	½ hour	5 ½ hours
Thursday	4 hours			1 hour	5 hours
Friday	4 hours	1 hour			5 hours
Saturday	3 hours	2 hours	2 hours	1 hour	8 hours
Sunday	2 hours	1 hour	2 hours	2 hours	7 hours

We Can! Screen Time Chart

Name: **Dates:**

	TV	Video Games	Hand-held Devices	Computer	Daily Total
Monday					
Tuesday					
Wednesday					
Thursday					
Friday					
Saturday					
Sunday					

production note: second side Screen Time Chart

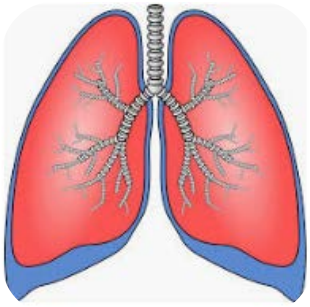
We Can! is a program from the National Institutes of Health that offers resources for parents, caregivers and communities to help children 8-13 years old stay at a healthy weight through eating right, increasing physical activity, and reducing screen time.

To learn more, go to http://wecan.nhlbi.nih.gov or call 1-866-35-WECAN.

we can!
Ways to Enhance Children's Activity & Nutrition

APPENDIX G

Health Mentors: Asthma Script



Health Mentors
Asthma

Tips for Health Mentors Program Advisors

It is important that the students that are presenting have the proper training; at least a one-day refresher course would be wise if the presentations take place long after initial training course.

*These kits are **not** always left completely ready for use—it would be a VERY good idea to get them a little early to not only have time to make sure you have everything you'll need for the demonstrations but also an excellent chance for presenting student "wizards" to familiarize themselves with the kits again.*

Demonstrations in the Health Mentors kits require products that may need to be refilled and/or repaired. Some of those items include training inhalers, straws, lung models, and handouts. Make sure you have these items if you plan to do those demonstrations.

** If you have any questions, comments, and/or suggestions please contact Anna Ehnstrom, Ellie Hoopman, or Caitlin Olson. We would like these kits to be as useful to teachers as possible, so we are always looking for ways to improve them.

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Health Mentors: ***Asthma***

This Health Mentors kit has been designed to demonstrate and teach concepts involving the prevention and management of asthma. The information for this demonstration was obtained and adapted from the Project ACCORD Asthma Education: An Integrated Approach curriculum and the Centers for Disease Control and Prevention's National Asthma Control Program. This script describes several demonstrations and learning objectives, however the script is certainly not meant to limit methods of presentation. Be creative and feel free to modify the presentations in any way.

As with each of the Health Mentors kits there are a few basic concepts we hope to convey to the students. Below is a list of those basic concepts.

Asthma Education Core Concepts

- Identify components of the respiratory system
- Define asthma as a condition that causes difficulty with breathing
- Identify causes and appropriate treatments for an asthma episode

Asthma Quick Script

Respiratory System: Trachea, Bronchioles, and Alveoli
Lung Model

Asthma = Airway Inflammation & Constriction
Straw Demonstration

Asthma Episode: Causes & Treatments
The Breathing Wheel

Additional Materials

- Asthma FAST FACTS for kids
- Asthma Action Plan for Home and School
- Your Respiratory System Diagram
- Worksheet #5: The Breathing Wheel
- Worksheet #6: Things That Can Make Your Breathing Difficult
- Worksheet #7: Things That Can Make Your Breathing Easier

References:

Minnesota Department of Health. (1998). Asthma Education: An Integrated Approach. Retrieved from http://www.health.state.mn.us/asthma/documents/asthmabook.pdf

Sohail, S. (2015, September 19). Breathe In, Breathe Out: The Respiratory System. Retrieved from https://www.education.com/worksheet/article/respiratory-system-diagram/

U.S. Department of Health & Human Services [HHS]. (2013, April 30). Asthma FAST FACTS for kids. Retrieved from the Centers for Disease Control and Prevention website: http://www.cdc.gov

The Health Mentors Asthma kit was designed by Anna Ehnstrom, Ellie Hoopman, and Caitlin Olson of the 2020 Bethel University Physician Assistant Program.

Core Concept #1: The Respiratory System

Purpose: Students will observe a kinesthetic model to view the respiratory process, identify respiratory system components, and understand the exchange of gases that takes place in the lungs.

Materials:

- Lung Model

Method:

1. Introduce the model to students by explaining that the clear tube represents the trachea, the plastic bags represent the lungs, the wires represent the bronchioles, and the red/blue clay balls represent the alveoli.
2. Demonstrate how the lungs work by blowing into the clear tube. Then, inhale to withdraw the air from the bags.
3. Continue to inflate and deflate the bags in an easy, steady manner. (For sanitary reasons, the clear tube should be replaced and/or cleansed prior to each new use. Extra materials have been provided within the kit to repair the lung model if needed).
4. Describe the function of the respiratory system using the explanation below.

Explanation: Your lungs are organs in your chest that allow your body to take in oxygen from the air. They also help remove carbon dioxide, which is a waste gas that can be toxic, from your body. The process of taking oxygen into and removing carbon dioxide from the body is called gas exchange. Gas exchange occurs in the alveoli. The red alveoli are oxygenated, whereas the blue alveoli are not. When a person has asthma, the bronchi and bronchioles constrict (get smaller), which makes it harder for the alveoli to receive oxygen (become red).

Core Concept #2: Defining Asthma

Purpose: Compare and contrast normal breathing to asthmatic breathing.

Materials:

- Regular Drinking Straws (one straw per participant)
- Coffee Stirrer (one stirrer per participant)
- Timer/Watch

Method:

1. Distribute one regular straw and one coffee stirrer to each participant.
2. Have the participants run in place for 30 seconds (without any straws/stirrers; normal breathing).
3. At the end of the 30 seconds, ask participants how running in place felt.
4. Next, have participants put the regular straw in their mouth, pinch their nose, and breathe normally through their mouth. Instruct participants to run in place for another 30 seconds.
5. Ask participants how running in place felt while breathing through a straw.
6. Have participants put the coffee stirrer in their mouth, pinch their nose, and breathe normally through their mouth. Have them run in place for 30 seconds once again.
7. Ask participants how running in place felt while breathing through a coffee stirrer.
8. Explain how the regular straws and coffee stirrers represent what it is like to have an asthma attack. Some attacks are more severe than others and require immediate action.

Explanation: During an asthma attack, the airways in your lungs (bronchi and bronchioles) become inflamed and constricted, which causes the size of the airways to decrease. This is because the lining of the airway thickens and mucus is formed. With less space in the airways, it is harder to breathe. Common symptoms of an asthma exacerbation include: very rapid breathing, chest pain or pressure, tightened neck and chest muscles, difficulty talking, feelings of anxiety or panic, paleness, excessive sweating, and/or blue lips or fingernails.

Core Concept #3: Asthma Episode

Purpose: Students will construct a breathing wheel that highlights the following: things that make breathing difficult and things that make breathing easier.

Materials:

- Worksheet #5, #6 & #7 (one worksheet per student)
- Scissors
- Crayons/Markers
- Paper Fastener (one fastener per student)

Method:

1. Introduce the activity by telling students that asthma can be "turned on" by trigger factors.
2. When someone with asthma encounters one of his/her triggers, the airways become swollen, produce too much mucous, and tighten up.
3. Explain that triggers are often common things that occur in our environment, and that we have all probably been exposed to them. What is interesting about asthma is that everyone's triggers are different.
4. Ask the students "What are things you think could affect the way we breathe if we have asthma."
5. Write student responses on the board and review the list with the class.
6. Circle the correct triggers listed and cross out any incorrect ones.
7. Ask the students, "What are things you think could improve the way we breathe if we are having an asthma attack." Repeat steps 5-6.
8. Distribute Worksheets #5, #6, and #7 and one fastener to each student.
9. Demonstrate to students how to assemble the breathing wheel.
10. Review the things that make breathing difficult and the things that make breathing easier.
11. Encourage students to take home their breathing wheels to share with their families.

Explanation: Common triggers for asthma include smoking, strong smells, cold weather, strong feelings, exercise, dust, fur, and feathers. Decreasing and/or eliminating exposure to these triggers can help to reduce the risk of having an asthma exacerbation. During an asthma episode, there are several measures that can be taken to improve breathing. These are often outlined by a doctor and given to the patient in the form of an Asthma Action Plan. Some common treatments include: inhaler use, rest, and visiting a doctor. A peak flow meter may be used to assess airway constriction. Other lifestyle measures that can be taken to reduce the severity and frequency of asthma episodes include smoking cessation, eliminating strong smell exposure, and eating a healthy diet.

APPENDIX H

Asthma FAST FACTS for Kids Handout

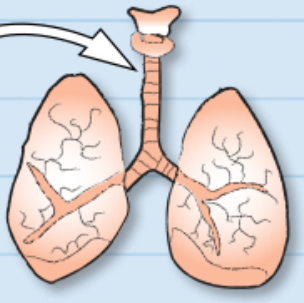
Centers for Disease Control and Prevention's (CDC)
National Asthma Control Program

Asthma FAST FACTS for Kids

What is Asthma?

Asthma (az-ma) is when air can't get into your lungs and you have trouble breathing.

The tubes that take air to your lungs get too tight (like a pinched straw) and this makes it hard for you to breathe.



What causes an asthma attack?

An asthma attack is when you have trouble catching your breath. Many different asthma "triggers" can cause this to happen. Some common "triggers" are:

- Dust in your house
- Tobacco smoke
- Dirty air outside
- Cockroach droppings
- Pets
- Mold
- Hard exercise that makes you breathe really fast
- Some medicines
- Bad weather
- Some kinds of food

Things you are worried about can cause an asthma attack. Even getting really excited, or feeling very mad, sad, or scared can cause an asthma attack.

How is asthma treated?

Several different kinds of medicine help people with asthma. People who have asthma don't always take the same medicine.

Some people use **INHALERS** to breathe in the asthma medicine. An INHALER is a little can of special air you squirt into your mouth and then breathe in.

Some people take pills to help them breathe better.

Some asthma medicine (mostly inhalers) is what you take when you need breathing help **RIGHT NOW!** You take this **QUICK HELP** medicine when you have an ASTHMA ATTACK.

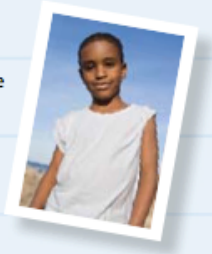
Other asthma medicine you would just take every day to help you avoid having too many bad asthma attacks.

Even if you are not having trouble breathing, you need to take this **EVERYDAY** medicine. But this everyday medicine will **NOT** help if you have an asthma attack. When you have an asthma attack, you need to take your **QUICK HELP** medicine.

You CAN Control Your Asthma!

Your doctor's office can help you make a plan just for you to help you control your asthma. A good plan means that

- You won't have as many asthma attacks
- You won't wheeze and cough as much, or maybe not at all
- You will sleep better
- You won't miss school
- You can play sports and games outside and at school
- You won't have to go to the hospital!

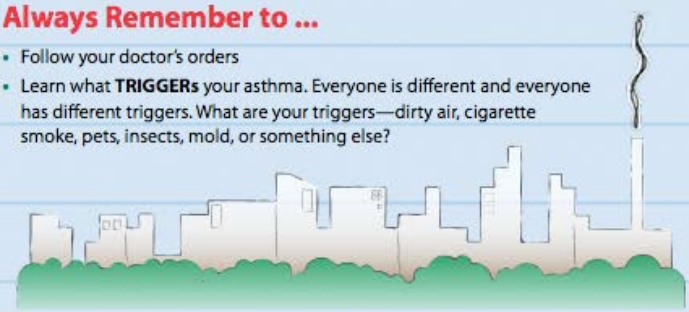


National Center for Environmental Health
Division of Environmental Hazards and Health Effects

CS213280

Always Remember to ...

- Follow your doctor's orders
- Learn what **TRIGGERs** your asthma. Everyone is different and everyone has different triggers. What are your triggers—dirty air, cigarette smoke, pets, insects, mold, or something else?



- If you have been running or playing and feel out of breath, stop and take a break!
- Know the warning signs of an asthma attack
  - » Wheezing and coughing
  - » Breathing too hard and too fast
  - » A feeling of tightness in your chest
- Whenever you leave the house, always take your **QUICK HELP** inhaler with you!

When you exercise, you will help your asthma... IF you follow these tips

Go easy — start exercising slowly and finish your exercise with a cool-down.

Take a buddy — play or excercise with a friend.

Know your triggers — stay away from the things that can trigger your asthma.

Take breaks — they will help you catch your breath. And drink plenty of water.

Mix it up — do different activities, like inline skating one day and taking a long walk the next day.

Check air quality — exercise outside only when the air is clean. Before you exercise, check the weather on TV or on a computer to see how clean the air is.

In 2000, more than one quarter of the swimmers on the US Olympics team had asthma and used inhalers.

Asthma didn't hold them back and asthma shouldn't hold YOU back!!!

Note: The next update of this fact sheet is scheduled for June 2011. More recent information may be available at the CDC's Air Pollution and Respiratory Health Branch's Asthma Web site at http://www.cdc.gov/asthma.

APPENDIX I

Asthma Action Plan for Home and School Handout

Asthma Action Plan for Home and School

AMERICAN LUNG ASSOCIATION.

Name _____ DOB ____/____/_____

Severity Classification ☐Intermittent ☐Mild Persistent ☐Moderate Persistent ☐Severe Persistent

Asthma Triggers (list) _____

Peak Flow Meter Personal Best _____

Green Zone: Doing Well

Symptoms: Breathing is good – No cough or wheeze – Can work and play – Sleeps well at night
Peak Flow Meter _____ (more than 80% of personal best)

Control Medicine(s)	Medicine	How much to take	When and how often to take it	Take at
	_____	_____	_____	☐Home ☐School
	_____	_____	_____	☐Home ☐School

Physical Activity ☐Use albuterol/levalbuterol ____ puffs, 15 minutes before activity ☐with all activity ☐when the child feels he/she needs it

Yellow Zone: Caution

Symptoms: Some problems breathing – Cough, wheeze, or chest tight – Problems working or playing – Wake at night
Peak Flow Meter _____ to _____ (between 50% and 79% of personal best)

Quick-relief Medicine(s) ☐Albuterol/levalbuterol ____ puffs, every 4 hours as needed

Control Medicine(s) ☐Continue Green Zone medicines

☐Add _____ ☐Change to _____

The child should feel better within 20–60 minutes of the quick-relief treatment. If the child is getting worse or is in the Yellow Zone for more than 24 hours, THEN follow the instructions in the RED ZONE and call the doctor right away!

Red Zone: Get Help Now!

Symptoms: Lots of problems breathing – Cannot work or play – Getting worse instead of better – Medicine is not helping
Peak Flow Meter _____ (less than 50% of personal best)

Take Quick-relief Medicine NOW! ☐Albuterol/levalbuterol ____ puffs, _____ (how frequently)

Call 911 immediately if the following danger signs are present
- Trouble walking/talking due to shortness of breath
- Lips or fingernails are blue
- Still in the red zone after 15 minutes

School Staff: Follow the Yellow and Red Zone instructions for the quick-relief medicines according to asthma symptoms.
The only control medicines to be administered in the school are those listed in the Green Zone with a check mark next to "Take at School".

☐**Both the Healthcare Provider and the Parent/Guardian** feel that the child has demonstrated the skills to carry and self-administer their quick-relief inhaler, including when to tell an adult if symptoms do not improve after taking the medicine.

Healthcare Provider

Name _____ Date _____ Phone (____) ____-_____ Signature _____

Parent/Guardian

☐I give permission for the medicines listed in the action plan to be administered in school by the nurse or other school staff as appropriate.
☐I consent to communication between the prescribing health care provider or clinic, the school nurse, the school medical advisor and school-based health clinic providers necessary for asthma management and administration of this medicine.

Name _____ Date _____ Phone (____) ____-_____ Signature _____

School Nurse

☐The student has demonstrated the skills to carry and self-administer their quick-relief inhaler, including when to tell an adult if symptoms do not improve after taking the medicine.

Name _____ Date _____ Phone (____) ____-_____ Signature _____

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Please send a signed copy back to the provider listed above.

APPENDIX J

Your Respiratory System Worksheet

Your Respiratory System

Directions: Look at the diagram. Read about what each part of the respiratory system does. Label each part of the respiratory system on the diagram.

nose – contains two nostrils which brings air in and out of the body

answer: _____

trachea or windpipe – a tube that connects the upper respiratory system to the lungs

answer: _____

lungs – the main part of the respiratory system; it puts oxygen into the bloodstream

answer: _____

mouth – can be used to suck in or expel air

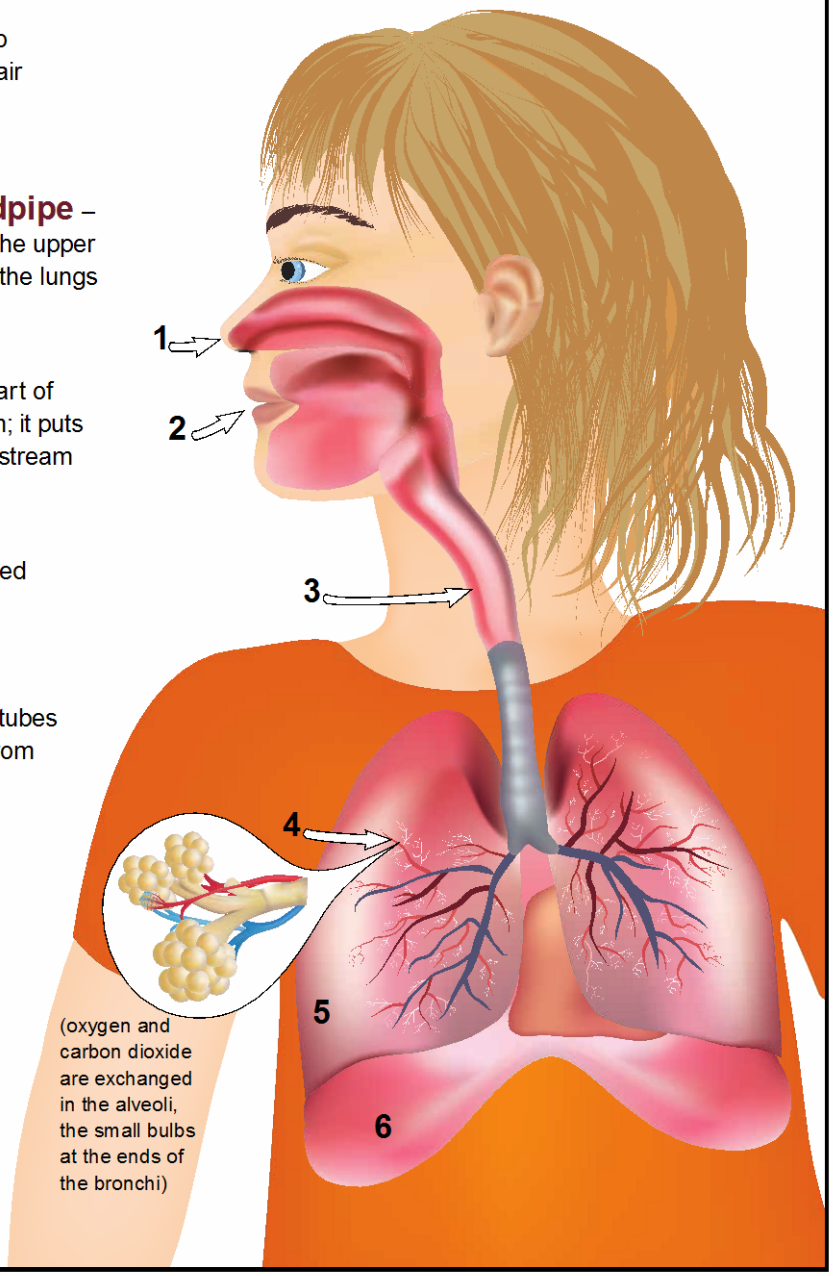
answer: _____

bronchi – smaller tubes that bring air to and from the lungs

answer: _____

diaphram – muscle that moves up and down to help expand your lungs

answer: _____



APPENDIX K

The Breathing Wheel Worksheets #5, #6, & #7

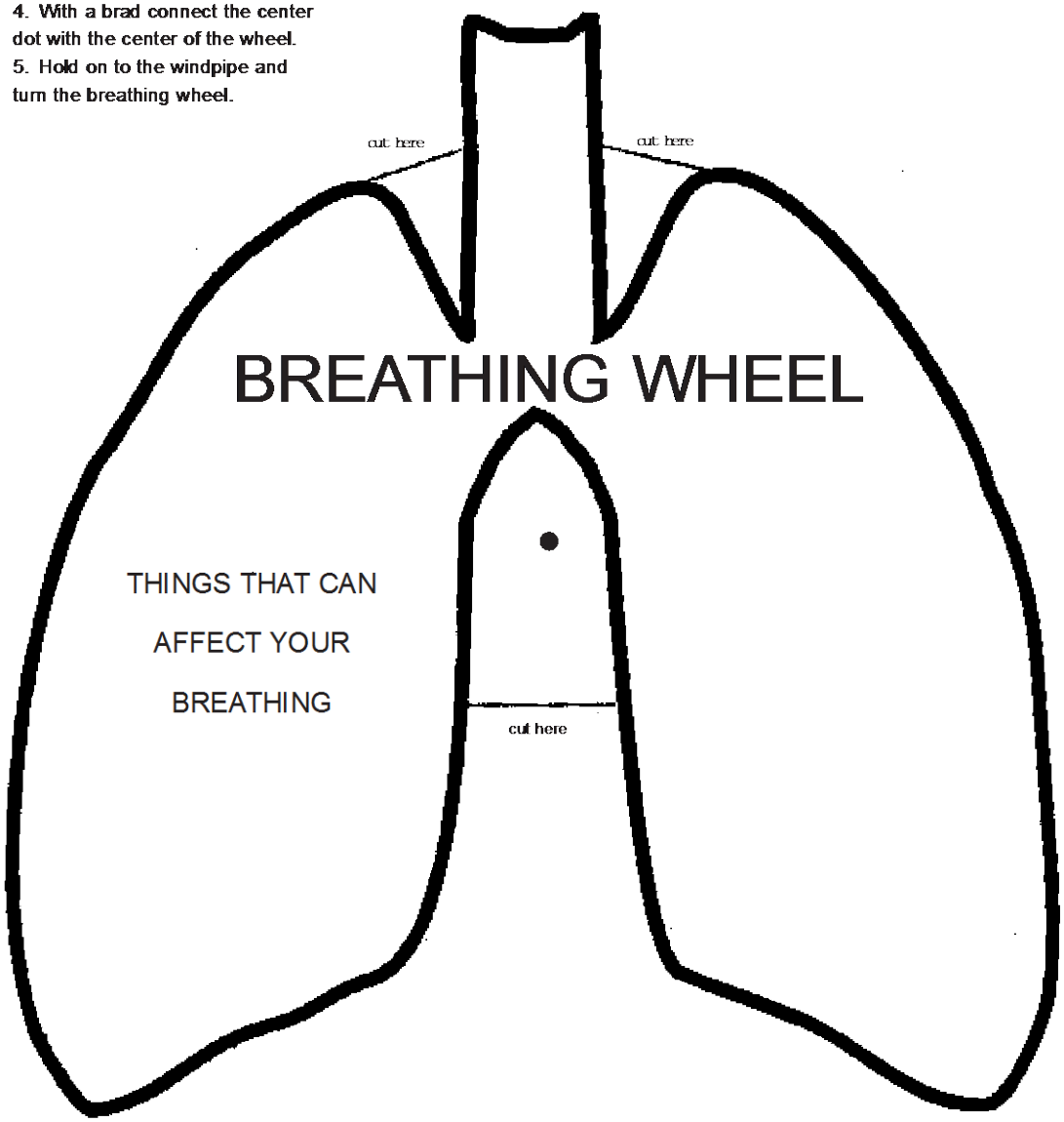
Worksheet #5: The Breathing Wheel

Directions

1. Put your name on the back of the lungs.
2. Cut on the dotted and dark lines.
3. Cut out the breathing wheel circle.
4. With a brad connect the center dot with the center of the wheel.
5. Hold on to the windpipe and turn the breathing wheel.

Name/Code _____

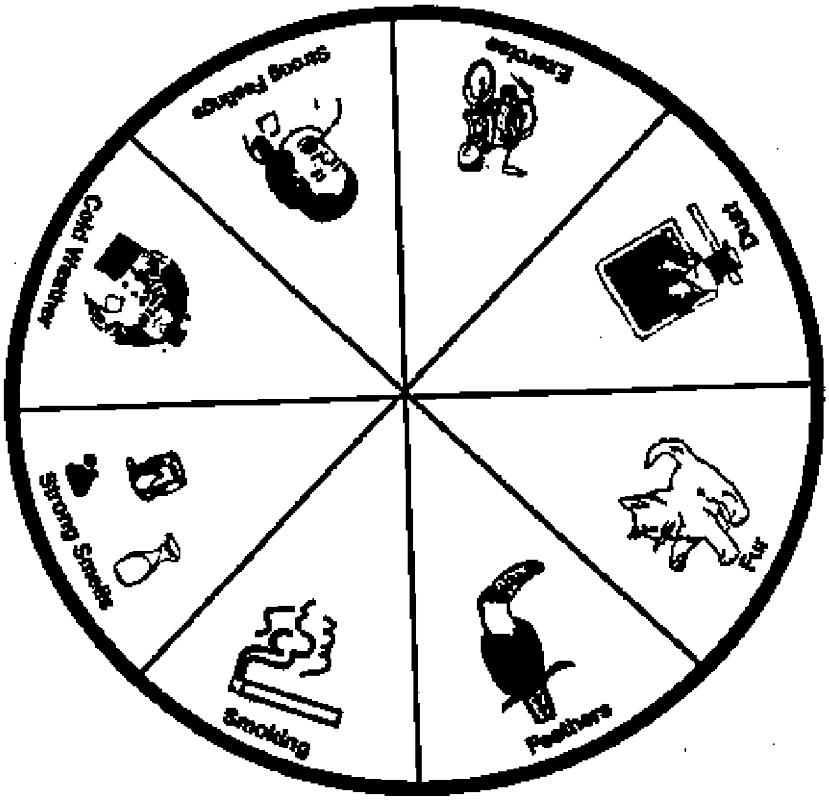
Date _____



Worksheet #6: Things That Can Make Your Breathing Difficult

Name/Code _____

Date _____



Worksheet #7: Things That Can Make Your Breathing Easier

Name/Code _____

Date _____