SCHOOL WELLNESS POLICY QUALITY MAY NOT REFLECT THE PRESENCE OF HEALTH PROMOTION PROGRAMS

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Title of Study: SCHOOL WELLNESS POLICY QUALITY MAY NOT REFLECT THE PRESENCE OF HEALTH PROMOTION PROGRAMS

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Abstract: Schools are an optimum environment to address children's health outcomes. Schools participating in federal Child Nutrition Programs are required to have a school wellness policy (SWP). Numerous organizations have developed health promotion programs to address school health environments through various approaches including nutrition services, nutrition and physical activity education and policy adoption. In general, research focusing on the presence of health promotion programs' relation to SWP is lacking. The purpose of this study was to determine the influence of presence of health promotion programs on the comprehensiveness and strength of SWPs in a sample of Oklahoma school districts during school years 2015 and 2016.
A sample of 344 school districts (63 percent) in the State of Oklahoma was used in this study. WellSAT 2.0 assessment tool was used to evaluate the strength and comprehensiveness of SWPs. Interrater reliability of 0.99 and 0.97 for SWP comprehensiveness and strength assessment tool was found for this study. School districts participation data in health promotion programs during our study period was collected from program websites and contact persons and the Oklahoma State Department of Education. ANOVA was used to compare means of SWP scores for each of the independent variables and chi-square was used to test for the difference in proportion between specific study variables. SWPs had a mean comprehensiveness score of 43.7 percent and mean strength score of 21.8 percent. Overall, school districts participated in a mean of 2.0 programs. There were no significant differences in comprehensiveness or strength scores by district geographic location (p =.68, p =.99, respectively), district type (p =.23, p =.42, respectively) or number (p =.50, p =.44 respectively), within ($p \geq .11$, $p \geq .08$, respectively) or between ($p \geq .13$, $p \geq .22$ respectively) types of health promotion programs. There was a difference in the proportion of health promotion programs in school districts by geographic setting ($p = .01$) and district type ($p = .00$). Presence of health promotion programs did not explain differences in quality of districts' written SWP. When reviewing and revising SWPs, school districts should ensure that policies reflect practices and wellness programming within the district to improve SWP quality.

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CHAPTER I

INTRODUCTION

Child health concerns related to undernutrition, and more recently obesity, have long been public health concerns in the United States (Ogden et al., 2014). Efforts of the United States Department of Agriculture (USDA) to address child health concerns started as early as 1946 with school lunch programs (Story, Kaphingst, & French, 2006; Gunderson, 2003; USDA, 2005). The National School Lunch Act passed by Congress in 1946 allocated funds to the different state education agencies through the Secretary of Agriculture (Gunderson, 2003). The state agency determined the criteria through which schools received the funds for the School Lunch Program based on need and student attendance (Lueke, 2011). These interventions not only decreased the risk of hunger and undernutrition in the short term, but also improved the quality of lives of the young people long term, thus benefiting the nation economically through better health outcomes and productivity (Gunderson, 2003).

By 1966, school-based nutrition services had expanded to include the National School Lunch Program (NSLP), Summer Food Service Program, Fresh Fruit and Vegetable Program, and School Breakfast Program to mention but a few (Child Nutrition

Act of 1996, 42 U.S.C. Secs. 1771 *et seq*.). By the 1970's, the child health concerns not only included undernutrition of youth but were also reflected in the increasing prevalence of childhood obesity (Cawley, 2010; Johnson and Johnson, 2015). In 2010, the Healthy Hunger-Free Kids Act (HHFKA 2010) authorized Congress to revise child nutrition standards to better address both these issues. Specifically, the HHFKA 2010, emphasized nutrition education, nutrition standards for foods sold in schools, physical activity, public participation, transparency and implementation of school wellness policy (SWP) among other topics (Rudd Center for Food Policy and Obesity, 2017). The programs are implemented in public, private schools and Residential Child Care Institutions (RCCIs) to provide children with nutritionally balanced, low or no-cost meals each school day. Child nutrition programs have the potential to address several challenges in school-age child health and wellness. School feeding aims to provide age appropriate amounts of daily nutrients (Briefel et al., 2009). School meals help decrease hunger and malnutrition, and increase school attendance and enrollment, leading to improved cognition, attention span and academic performance (Food Research and Action Center (FRAC), 2017).

Health promotion programs operating within school districts support school systems through promoting educational opportunities and improving the learning environment of school-age children (Hager et al., 2016). For example, some of the health promotion programs provide policy guidance to school districts on nutrition standards for foods and beverages in and around school environments (Alliance for a Healthier Generation, 2017). Such efforts by external collaborators adapt to the Elementary and Secondary Education Act (ESEA) which was reauthorized by the Every Student Succeeds Act (ESSA) of 2015, which prioritizes school-age child wellness through funding for school

agencies to address educational needs with school child feeding placed among the priorities (Lueke, 2011; FRAC, 2012).

In addition to following the nutrition standards, the USDA requires school districts participating in the Child Nutrition Programs to have a school wellness policy to use as a fundamental tool to promote healthy school environments and reduce childhood obesity (Nanney & Davey, 2008; Briggs, Safaii & Beall, 2003). The wellness policies must include goals for nutrition promotion and education, physical activity, and other activities that bolster school-age child wellness. Local school food authorities (LSFAs) oversee school feeding programs in line with school wellness policies. Further, local education agencies (LEAs) are required under the HHFKA 2010, Sec. 204 to meet the local school wellness policy (USDA, 2017b). This mandate strengthens the Child Nutrition and Special Supplemental Nutrition Program for Women, Infants and Children (WIC) Reauthorization Act guidelines on the requirement of school wellness policies by all school district implementing federally funded school meal programs (Sec. 204 of Public Law 108-265).

The HHFKA 2010, updated the administrative review process of the SWP. Reviews to evaluate the school nutrition programs are conducted in a three-year cycle by the state administrative agency to ensure HHFKA program requirement implementation (USDA, Food and Nutrition Service, 2016). These reviews primarily focused on SFAs operations and assured policy included required components; they did not evaluate the strength and comprehensiveness of the policy. Recognizing the need for a systemic and rigorous policy review process, researchers began assessing local wellness policies and identified that a challenge still exists on the quality of the wellness policies in terms of

strength and comprehensiveness to enable school authorities to address school-age child health promotion (Rudd Center for Food Policy & Obesity, 2017; Chriqui et al., 2013; Lucarelli et al., 2015).

To assist schools in writing and implementing strong and comprehensive policies, many health promotion programs supported by multiple government and non-government organizations have emerged. In Oklahoma these include, but are not limited to, Cooking for Kids, Alliance for a Healthier Generation, It's All About Kids, Certified Healthy Schools, Certified Healthy Community, Oklahoma Tobacco Settlement Endowment Trust (TSET) Incentive grant, Tobacco Settlement Endowment Trust Communities of Excellence in Physical Activity and Nutrition (TSET-CXPAN) and Schools for Healthy Lifestyle. Hager et al. (2016) reported that due to limited resources and competing priorities, schools and school systems should collaborate with other organizations to ensure full implementation of local wellness policies. The presence of health promotion programs may support and incentivize school districts and their respective schools in developing strong and comprehensive wellness policy and perhaps subsequent implementation of the policy that would promote school child health (Hager et al., 2016). Research is limited on the influence of the presence of health promotion programs and the quality of school wellness policy that affects school-age child nutrition and health.

Against that background, this study was designed for school districts within the State of Oklahoma whose public schools' wellness policies had been reviewed for the school years 2015 to 2016. Therefore, the aim of the study was twofold: 1) to describe the policy strength and comprehensiveness of a sample of Oklahoma school districts' school wellness policies as measured by the WellSAT 2.0 policy assessment tool and 2)

to examine the relation between the presence of different health promotion programs in schools on the strength and comprehensiveness of the respective school district wellness policies during school years 2015 and 2016.

Research questions

1. What is the strength and comprehensiveness of school wellness policies of school districts in the State of Oklahoma?
2. Is there a difference in SWP strength and comprehensiveness scores based on geographic setting and type of the school districts?
3. What is the level of participation of schools in different school health promotion programs?
4. Is there a difference in SWP strength and comprehensiveness scores based on the number of health promotion programs present in a school district?
5. Is there a difference in SWP strength and comprehensiveness scores based on the type of health promotion programs present in a school district?

Objectives

The specific objectives of the study were to:

6. Describe the strength and comprehensiveness of Oklahoma school districts SWP.
7. Compare SWP strength and comprehensiveness scores based on geographic setting of the school districts.
8. Compare SWP strength and comprehensiveness scores based on type of the school districts.
9. Determine the level of participation of school districts in different school health promotion programs.

10. Compare SWP strength and comprehensiveness scores based on number of health promotion programs in the school districts.
11. Compare the SWP strength and comprehensiveness scores based on the types of health promotion programs in the school districts.

CHAPTER II

REVIEW OF LITERATURE

School-age child health

The health of school-age children has been affected by increased prevalence of obesity attributed to general feeding patterns of children while at school and home (Centers for Disease Control and Prevention, 2016). Many children live a lifestyle characterized by lack of exercise and physical activity that is insufficient to utilize the dietary calories taken in, thus leading to increased adiposity and obesity (Trost et al., 2001). The Centers for Disease Control and Prevention (CDC) (2016) describes obesity as a higher ratio of weight for a given height than what is considered healthy. Amongst children and adolescents 2-19 years old, a BMI $\geq 95^{th}$ percentile for age and gender is defined as obesity (CDC, 2016).

A nationwide health poll in the U.S. revealed obesity as the top most health problem facing children (Cawley, 2010). Johnson and Johnson (2015) mention that obesity has been one of the biggest public health concerns in the U.S., with the rates tripling in the last 30 years. The prevalence of obesity among U.S. youth was 17.1 percent in 2013–2014 (National Center for Health Statistics, 2016).

The State of Obesity (2017) report ranked the State of Oklahoma ninth in the prevalence of obesity amongst 50 states and the District of Columbia with a 32.8 percent prevalence which further highlights the magnitude of the health challenge in the state. If left unaddressed, the effects of childhood obesity will be long-lived through the lifetime of an individual. The continued increase in childhood overweight realized in the past several decades has also increased the prevalence of Type II diabetes in children and adolescents (Sinha et al., 2002). The cost of childhood obesity is not only associated with the risk of adult obesity and metabolic syndrome (Serdula et al., 1993; Sun et al., 2008) but also with health, social and psychological risks during the growth of a child (Freedman et al., 1999; Datar et al., 2004).

Over the years, there has been increased attention drawn to schools regarding child health. Importantly, time spent in school-based settings for American children has increased over the past decades. American children aged 6 to 12 spent about 32 to 33 hours per week in school (Timmer et al., 1985; Hofferth & Sandberg, 2001). These school hours are highlighted with two of three main meals for a school-age child. Chitra and Reddy (2006) described the importance of the three fundamental meals with specific mention on breakfast as the most important meal of the day. While participation in the School Breakfast Program (SBP) is generally lower than the participation in the National School Lunch Program (NSLP), at least 14.7 and 30 million children, respectively, benefit from the SBP and NSLP (USDA, 2017). Almost all children who eat a school breakfast eat school lunch while some who don't have the school breakfast will have lunch (Bartfeld et al., 2009).

The USDA (2017) ranks Oklahoma 23 and 26 out of 57 states/territories for participation in the SBP and NSLP, respectively. The State of Oklahoma had a 2.6 percent growth in free or reduced-price breakfast participation over the past five years and reported that 96.9 percent of Oklahoma schools served lunch and breakfast. Because many children rely on the schools for two-thirds of their daily meals, school meals have a critical role in defining the child's eating patterns, and thus influence their nutrition status, physical and cognitive development (Clarke et al., 2013; Hofferth et al., 2003). Through the Food and Nutrition Service, children are provided with healthy school meals that not only improve their health but also contribute to a good academic performance (FRAC, 2017). The U.S. government through the Every Student Succeeds Act (ESSA) of 2015 authorizes local education agencies (LEAs also known as school districts) and state education agencies to fully prepare students for the future, that is academically and professionally. The ESSA focusses on ensuring that every child in a school environment is holistically supported through provision of school meals whose absence has been highlighted as a cause of absenteeism, behavioral referrals and tardiness (FRAC, 2012).

In addition to meals consumed by children, physical activity has a vital role in the management of their weight. The Centers for Disease Control and Prevention (2016) recommends children and adolescents engage in at least 60 minutes or more of physical activity daily. Furthermore, the State of Oklahoma upholds the physical activity recommendation under the Senate Bill 312, section 1(b) requiring school-age children to be engaged in a minimum of 60 minutes of physical education weekly which could include exercise programs. Additionally, schools are expected to implement the Senate Bill 1186, section 1(d) that requires an extra 60 minutes of physical activity weekly for

full-day kindergarten children, school-age children, grade one through five targeting wellness and nutrition education of students (Oklahoma State Department of Education, 2015). Lee, Burgeson, Fulton, & Spain, (2007) reported that many schools easily exempt many students from physical exercise which affects the fulfillment of the physical activity recommendations for their wellness. Additionally, while most school districts teach physical education, few schools emphasize physical activity and opportunity for physical exercise to their school-age children.

Social Ecological Model

The Social Ecological Model (SEM) is a theoretical model that is used to explain multiple levels of influence on health and wellness behaviors (CDC, 2015). Boyle and Holben (2010) mentioned that an ecological approach to health promotion is emphasized within national programs, health goals, objectives and initiatives. The emphasis on schools to address the immediate and long-term health of school-age children is best supported by the SEM framework (Bronfenbrenner, 1979; Boyle & Holben, 2010). In a social-ecological framework, the school health environment has potential to positively influence children's health and thus be protective against child obesity and its outcomes. School health promotion programs influence school environments, the people in and around the school and have the potential to affect school policies which in turn affects health promotion practices for the school-age children (Boyle & Holben, 2010).

As shown in table 1, an individual's social and physical environment, whether their family, workplace, neighborhood, or school, can directly and indirectly affect health beliefs and behaviors (Bronfenbrenner, 1979; McLeroy et al., 1988; Skokols, 1996).

Table 1: Detailed description of the Social Ecological Model framework as applied to school health promotion

Attribute	Description
Individual	This level indicates the school-age child who may be predisposed to obesity due to an unhealthy nutritional and physical activity lifestyle. The factors influencing the health status at individual level include gender, attitude, knowledge, beliefs, skills, health status and actions of the individual.
Interpersonal	Inter-relations amongst persons is a key aspect for health promotion programs. The persons overseeing different health promotion programs in school environments implement and monitor the programs through interacting, observing and gathering feedback on specific activities. Further, there are interactions between persons participating in the different health promotion programs.
Institutional and organizations	The level consists of institutions that work towards the well-being of the individual(s) for example schools, workplaces, school districts and unions. It includes wellness programs within these institutions and how they influence the other constructs within the model.
Community	The level relates to persons within the same geographic confines with homogenous resources and leadership. It also includes practices and beliefs of the group.
Structures and systems	This represents the county, state and federal systems including the existing laws and policies regarding health promotion and wellness. According to USDA (2017a), some of the more recently laws included the HHFKA, 2010, child nutrition program flexibilities for milk, whole grains, and sodium requirements, and earlier established rules such as the NSLP, SBP, free and reduced priced eligibility, special milk program for children to mention but a few.

(CDC, 2015)

According to the committee on Accelerating Progress in Obesity Prevention (2012), there is a general assertion that major practical and policy considerations are

required in planning of strategies to expedite obesity prevention. The report further recognized that different strategies including encouraging different institutions, such as schools, help improve the health status of individuals and communities. While individuals are personally responsible for making healthy food and physical activity choices, the organizations and environments where they spend a majority of their time influence these decisions. Likewise, policies, both formal and informal, guide the access to healthy food and opportunities for physical activity at the community and organizational levels. The levels of influence may also be reciprocal, in that individual and family values and best practices of organizations and communities may influence adoption of policies, including both the extent and strength of the policy language. The SEM theoretical framework was adopted for this study to demonstrate the relation between the presence of health promotion programs and the SWP quality in the different school districts in the State of Oklahoma.

Research logical model

This study's logical model was adopted from the SEM framework. The framework presents the independent variable, presence of health promotion programs and its relation to the dependent variable, SWP quality which influences the outcome, school-age child health through reduction of childhood and adolescent obesity. This direct relation forms the core of the study; it recognizes that other determinants of SWP quality as intermediate variables, these include school district geographic setting and types of school districts.

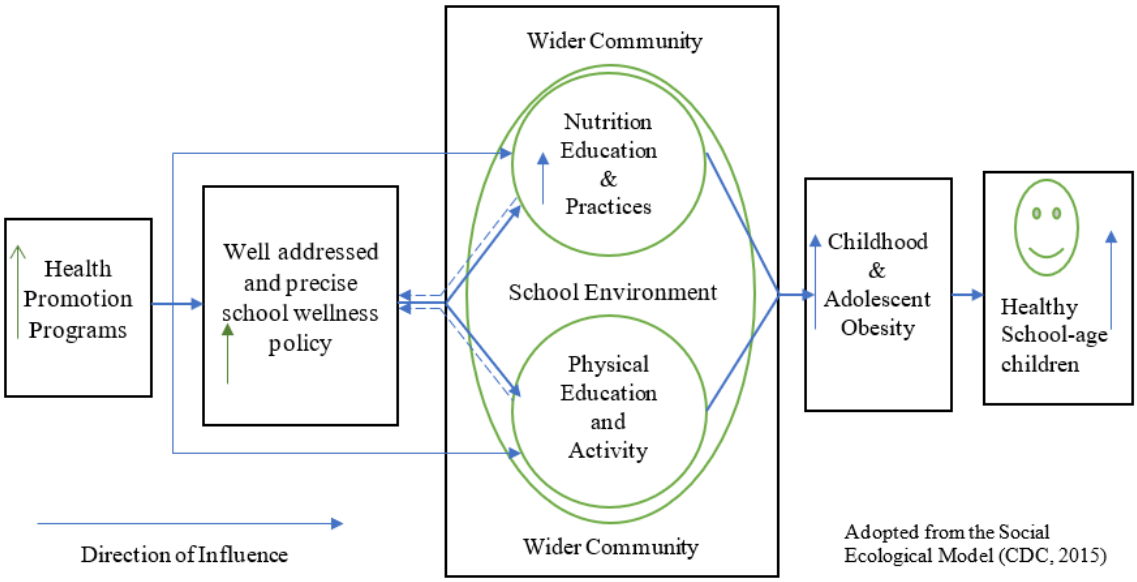

Figure 1: Study research logic

School Wellness Policy (SWP)

School Wellness Policies support local education agencies (LEAs), school districts and parents in school-age child health promotion. SWPs promote wellness, help protect against childhood and adolescent obesity and ensure that school meal nutrition guidelines are consistent with federal school meal standards (USDA, 2017b). In 1995, the federal government updated school meal regulations requiring all school lunches and breakfasts to be consistent with nutrition recommendations outlined in the Dietary Guidelines for Americans. In 2004, the U.S. Congress passed the Child Nutrition and Special Supplemental Nutrition Program for Women, Infants and Children (WIC) Reauthorization Act requiring each school district participating in the NSLP to have a local wellness policy (USDA, Food and Nutrition Service, 2004). These rules were further amended by the HHFKA, 2010 (Sec. 204 of public Law 111-296), which established grade appropriate standards for calorie ranges, saturated fat and sodium (HHFKA, 2010). The USDA gave LEAs flexibility in designing their wellness policies though maintained that focus must be made towards physical activity, nutrition

promotion and education. Additionally, LEAs must maintain nutrition standards for all competitive foods on school campuses and must be consistent with federal regulations for program meals and Smart Snacks. Similarly, marketing of foods and beverages in school environments during school days must meet federal regulations on Smart Snacks in school nutrition standards (USDA, 2017b). Consistent with the description in SEM framework, wellness policies support development of school health environments aimed at positively influencing school-age children nutrition and physical activity behaviors.

The USDA developed sample wellness plans to guide school districts in designing local policies (USDA, Food and Nutrition Service, 2004; HHFKA, 2010). These local school wellness policies are often drafted by a school health council, or committee, comprised of school district personnel together with a few selected members from the community, who may or may not use the USDA sample plans. The need to include school employees in the policy development process cannot be understated since they directly implement the policy and have a closer interface with different health promotion programs within the schools (Nollen et al., 2007). These policies are then approved, adopted and monitored by the state agency (USDA Food and Nutrition Service, 2016). In the early years of the wellness policy requirement, the plans often fell short of expectations. More recently, Chriqui et al. (2013), Lucarelli et al. (2015) and Schwartz et al. (2012) reported that the comprehensiveness and strength of wellness policies have improved since 2006/07 though both aspects continue to remain relatively weak as far as the assessment scores are concerned.

Wellness policy assessment

The progress in SWP strength has been measured in part by the WellSAT policy evaluation tool developed by researchers at the Rudd Center for Food Policy and Obesity (Rudd Center for Food Policy & Obesity, 2017). Brissette et al. (2013) reported that the WellSAT tool was initially developed in 2010. The most recent revision of the WellSAT tool, known as the WellSAT 2.0, was reviewed and updated in 2014 to reflect competitive food regulations consistent with the HHFKA 2010 (Rudd Center for Food Policy & Obesity, 2017). WellSAT 2.0 varied from the previous WellSAT tool that had 96 items and 7 sections (Brissette et al., 2013; Rudd Center for Food Policy & Obesity, 2017). The WellSAT 2.0 offers a quantitative method for measuring the comprehensiveness and strength of local school wellness policies. Both components (comprehensiveness and strength) are assessed using 78 possible policy items categorized into six sections of the USDA policy guidelines. The items are scored on a scale of zero (0) for a no points when the element is not addressed in the policy, one (1) point for when the element is partially addressed, and two (2) points for a when the element if fully addressed.

The WellSAT 2.0 is widely used and is an accepted standard tool for SWP evaluation. Schwartz et al. (2009) reported that the WellSAT was the most used tool to assess SWPs and had an acceptable interrater reliability (IRR). The IRR was tested by computing the interclass correlation coefficient (ICC). The WellSAT is a reliable and consistent tool to evaluate the quality of SWP based on the ICC with a mean IRR of 0.82 (Cronbach's alpha) for both total SWP comprehensiveness and strength (Schwartz et al., 2009). A study on the quality of school district wellness policies in the State of Oklahoma

reported an IRR of 0.99 and 0.97 for SWP comprehensiveness and strength respectively (Berg, 2015).

Health promotion programs

While school districts worked to adopt and implement SWPs, the presence of various government and non-government health promotion programs emerged. The purpose of the programs was to support and incentivize schools in developing strong and comprehensive wellness policy and subsequent implementation of the policy. For example, Certified Healthy Schools in the State of Oklahoma provides support and recognition to schools that excel in creating healthy environments for their students (Certified Healthy Oklahoma, 2017). The services of the different health promotion programs vis-à-vis possible SWP items affected were summarized (Appendix A). The health promotion programs that were active in Oklahoma during the period of this study are described below.

Tobacco Settlement Endowment Trust (TSET)

The TSET was established as a result of a 45-state multiple lawsuit against predatory and egregious marketing filed against tobacco companies that culminated in the master settlement agreement for the entire nation. Nationally, tobacco companies were stopped from targeting youth and using promotional materials that may compel minors to engage in tobacco use. In addition, an annual payment was to be provided to the different states from the tobacco industry. Oklahomans voted to create a constitutional endowment trust to protect the payments. Three-fourths of the annual proceeds are deposited in the trust while the remaining 25 percent is split between the state legislature (18.75 percent) and the Oklahoma Attorney General (6.25 percent) for administrative payments. The

earnings on the trust are used to fund grants and programs to improve health outcomes in Oklahoma, including Communities of Excellence in Physical Activity and Nutrition (CXPAN) and Healthy Incentive Grants. (Tobacco Settlement Endowment Trust, 2017).

TSET-CXPAN

Tobacco Settlement Endowment Trust (TSET) Communities of Excellence in Physical Activity and Nutrition (CXPAN) was a grant program offered to counties or a consortium of counties throughout Oklahoma. The funded grantees were charged with engaging communities, schools and businesses that were ready to address salient health concerns not limited to uncontrolled tobacco use but also poor nutrition and lack of physical activity (Tobacco Settlement Endowment Trust, 2017). The focus of TSET was to promote policies that supported healthy choices and behavior especially among children due to increased vulnerability and implications on health in the future. Through promoting comprehensive and acceptable policies within the local community, TSET focused on five key areas. These included promotion of physical exercise, physical activity and reduction of sedentary lifestyles, regulation of promotion and access of low nutrient foods and beverages, increasing access to healthy foods and beverages and raising awareness on obesity and importance of physical exercise in its prevention. In 2015, TSET-*CXPAN* was replaced by TSET Healthy Living program. The program awarded 49 community grants to 63 counties and covered 94 percent of the State of Oklahoma's population (Tobacco Settlement Endowment Trust, 2017).

TSET Healthy Incentive Grant

TSET additionally awarded incentive grants to school districts within the State of Oklahoma that received certification through Certified Healthy Oklahoma, a program administered by the Oklahoma State Department of Health (OSDH, 2017). (Further description of the Certified Healthy Oklahoma programs is provided below.) School districts that achieved Certified Healthy recognition were eligible to apply for the incentive grants dependent on the availability of funds and other factors such as a high impact SWP and action plans to improve the school health environment. TSET awarded over $3 million in healthy incentive grants since 2012 to school districts to facilitate and incentivize strengthening district wellness policies to better school-age child nutrition, ensure a tobacco-free environment for all persons and increase physical activity (Tobacco Settlement Endowment Trust, 2017).

Certified Healthy Oklahoma

Since 2003, the Certified Healthy Oklahoma program has been identifying and working with institutions committed to supporting healthy choices through environmental and policy change. Various institutions within the community have been reached including but not limited to early childhood programs, schools, and campuses through a voluntary and no-cost certification in the State of Oklahoma. These entities work to improve the health of Oklahomans by implementing policies, elements, and programs that impact Oklahomans eating habits, physical activity engagement, and avoid the use of tobacco. The program began through a joint effort of collaborating partners including, the Oklahoma State Chamber, the Oklahoma State Department of Health, the Oklahoma Academy for State (Certified Healthy Oklahoma, 2017). Two programs under Certified

Healthy Oklahoma with potential to influence school policies and environments are described below.

Certified Healthy School

Certified Healthy School program recognizes school sites that are working to improve student, faculty and staff health by providing wellness opportunities and implementing policies that lead to healthier lifestyles through physical activity and nutrition. The program was founded in 2010 by the Oklahoma legislature. The program is overseen by the Oklahoma State Department of Health, Center for the Advancement of Wellness. In 2014 to 2016 including the period of this study, Certified Healthy School programs were approved in 1,970 schools of 2,143 school applicants realizing a 91.9 percent certification rate in the State of Oklahoma (Certified Healthy Oklahoma, 2017).

Recognition of schools is based on a scoring system of 9 categorized key facets (physical education, health education, nutrition environment & services, health services, counseling, social & emotional school climate, psychological, & social services, physical environment, employee wellness and family engagement & community involvement) that address aspects of Whole School, Whole Community and Whole Child Model and align with many of the SWP requirements. The schools are then ranked into three program classifications including the basic rank where a school fulfills at most 2 criteria of the 9, merit rank where the school fulfills at most 3 criteria of the 9 categories and the excellence rank where the school fulfills at least 4 criteria of the 9 categories (Certified Healthy Oklahoma, 2017).

Certified Healthy Community

Certified Healthy Community was also initiated in 2010 with an objective of encouraging communities to create safe and supportive environments, and generally

promote wellness and adoption of healthy behavior. Enrolling in the program is based on a voluntary certification. This annual certification process recognizes communities in the State of Oklahoma for their efforts and accomplishments towards creating communities that are conducive to increasing access to healthy foods, opportunities for physical activity and tobacco free environments where residents live, work, learn, and play. Certified Healthy Community promotes program implementation that not only reaches groups of people within the community but also targets on individuals to initiate the change process for better health (Certified Healthy Oklahoma, 2017). It is logical that there is synergetic and reciprocal support between Certified Healthy Communities and Certified Healthy Schools in supporting the creation of heathy environments.

Schools for Healthy Lifestyles

Schools for Healthy Lifestyles (SHL), rebranded to Healthy Schools Oklahoma (HSOk) in 2017, has operated under the same mandate since 1997 of facilitating development of healthy lifestyle choices among Oklahoma youth, their families and faculty through preventive, community-based, school health education programs. HSOk provides resources for schools to focus education programs addressing injury prevention, physical activity and nutrition. As with the previously described programs, these efforts align with the aims of the SWP. HSOk uses a highly collaborative private-public structure that multiples and magnifies resources such as volunteers, information, funding and ongoing support services. To-date, HSOk promoted school-age child health in 68 elementary schools with more than 35,000 students, their family members and school faculty in the State of Oklahoma (Healthy Schools Oklahoma, 2017).

It's All About Kids

It's All About Kids (IAK) began in 2004 with an overall goal of academic and health improvement through promoting learning, nutrition education and comprehensive nutrition within schools, aligning with the nutrition education, physical education and physical activity and wellness promotion sections of the SWP. The program works towards improving children's attitudes, practices, and knowledge towards physical activity and nutrition. Each year, the program reaches out to an estimated 8,500 students within the public-school districts in the city of Tulsa, Oklahoma. Furthermore, the program organized more than 40 educational events annually for parents, guardians and families in a Whole School, Whole Community, Whole Child (WSCC) model approach with children at the center of the focus for health promotion. Additionally, IAK operates with schools to continuously record data regarding different variables such as school scores on students' behavioral change and school attendance (It's All About Kids, 2017).

Cooking for Kids

Cooking for Kids offers no-cost culinary training for child nutrition professionals to support schools in preparation and serving of healthy meals, consistent with the USDA school nutrition standards (Cooking for Kids, 2017). The Pew Charitable Trusts, Robert Wood Johnson Foundation and American Heart Association report (2014) on school meals reinforces the goals of Cooking for Kids through the acknowledgement that state child nutrition agencies and local School Food Agencies (SFAs) should support school-age child feeding by administering the programs and ensuring that meals meet minimum nutrition standards. These efforts align with the school meal and nutrition standards of the SWP requirements. Furthermore, the report accentuates within its recommendations the

need for nonprofit, profit organizations and SFA's to not only enhance kitchen infrastructure but also to provide for the training needs of School Nutrition Professionals and other key persons concerned with school-age child wellness (Pew Charitable Trusts et al., 2014). Cooking for Kids supports school sites to prepare and serve healthy and appealing lunches on budget to school-age children. This enhances effective utilization of food, reduction of waste and improvement of student health (Cooking for Kids, 2017).

Alliance for a Healthier Generation

Alliance for a Healthier Generation is a national level program that works with schools in different states, as well as other organizations, to transform wellness policies, conditions and systems that lead to healthier kids. It focuses on a child's environment with the understanding that places where children spend most of their time determine their behaviors. Alliance for a Healthier Generation empowers person(s) who influence the school-age children environments by giving them easy access to science-based resources and best practices to create healthy environments that encourage the healthiest lifestyles (Alliance for a Healthier Generation, 2017).

School districts and health promotion programs

There are different school district types such as independent, dependent, residential child care institutions (RCCIs) and charter school districts, all of which are required to have a SWP if they receive federal funding through the Child Nutrition Programs. Independent school districts in the general context represent publicly supported schools serving kindergarten through 12th grades, also referred to as K-12. Dependent schools in this study included schools serving kindergarten through the 8th grade, necessitating students to attend an independent school district to complete a high

school diploma. Charter schools provide free public elementary and/or secondary education to eligible students under a specific charter granted by the state legislature or other appropriate authority. They could have affiliations with a school district, another institution or private organization though largely focus on their academic mission (Nelson & Hollenbeck, 2001). The Oklahoma Department of Human Service, Child Care Services describes RCCIs as institutions that include but are not limited to: homes for the mentally, emotionally, or physically impaired, unmarried mothers and their infants; group homes; halfway houses; orphanages; temporary shelters for abused and for runaway children; long-term care facilities for chronically ill children; and juvenile detention centers. They are further explained as any public or nonprofit private institution that operates principally for the care of children, and, if private, licensed to provide residential child care services under the appropriate licensing code by the State or subordinate level of government (Oklahoma Department of Human Services, 2017).

The Institute of Education Sciences, National Center for Education Statistics (IES-NCES) (2014) reported 75 percent of educational institutions in the U.S. were public independent or dependent school districts with one percent being RCCIs or charter school districts. Only 24 percent of the school districts were private school districts (U.S. Department of Education, 2016). The Institute of Education Sciences et al. (2014) report is consistent with a cross sectional study that was carried out in the State of Michigan that showed that up to 83 percent of the school districts were public (non-charter school districts) and only 17 percent fitted the other category that included charter school districts and RCCIs (Lucarelli et al., 2015). Furthermore, the Oklahoma State Department of Education (OSDE) (2017) records showed that the state had an average of 529 school

districts for the school years 2015 and 2016 with 419 independent school districts (79 percent), 97 dependent school districts (18 percent), 14 charter school districts (2.6 percent), and other school districts including RCCIs represented by 0.4 percent.

School district locale and wellness policy

In addition to the different types of school districts, the school districts in this study were in a variety of geographic settings/locales identified as rural, urban and mixed. The U.S. Census Bureau (2010) defined an urban area as a geographic locale whose land had many developments and were densely settled upon with at least 2,500 people, also, an urban setting may have non-residential urban land uses. Differently, a rural locale has less than 2,500 people with vast undeveloped land. Mixed settings have attributes of both but incomprehensive rural and urban locales. For example, a place that has a population less than 2,500 but with more developed land will possibly rank as a mixed setting.

According to the Institute of Education Sciences, National Center for Education Statistics (2015), the State of Oklahoma reported that 14.3 percent schools (256 schools) were in an urban setting, 12.2 percent (218 schools) were in a mixed setting defined as suburban and the majority 73.5 percent (1,315 schools) were located within the rural setting. Differently, a study in the State of Michigan reported the highest distribution of school districts (54 percent) in an urban setting, followed by 27 percent with a rural setting and only 19 percent in a suburban (mixed) setting.

Recent studies (Piekarz et al., 2016; Chriqui et al., 2013) reported on school-age child health focusing on wellness policies based on school district characteristics including locale, district size, ethnicity, region and socioeconomic status. Piekarz et al.

(2016) reported that an eight-year evaluation (2006-07 through 2013-14) of wellness policies showed no significant differences among school district locales though rural school districts had relatively weaker policies compared to the school districts in large and mid-sized cities (Piekarz et al., 2016).

Link between presence of health promotion programs and wellness policy

As previously mentioned, school wellness policies are often guided by model policies drafted by organizations, such as samples developed by the USDA, then modified by a local school health council to meet the local situation before being adopted. The school health council is a group of individuals representing a school district and its community that provide guidance on aspects of school health promotion (Brener et al., 2004). Essentially, school wellness policies are established from engagement of various community stakeholders that are formed under community school health coordinating council. Strong and comprehensive wellness policies are valuable tools to these councils and provide the authority to establish school health environments that positively affect school-age child health and contribute to the prevention of childhood obesity. In other words, policies that are vague in language and less action-oriented limit the council's scope to effectively influence in creating the desired environments (Frieden, Dietz & Collins, 2010).

While many studies have been conducted to understand the influence of wellness policies on promoting healthy food choices in relation to school age children (Cullen et al., 2007; Ballard et al., 2011; Brownson et al., 2010; Mendoza et al., 2010; Brescoll et al., 2008), they mostly demonstrate a link between school physical activity/ nutrition environments and other health related outcomes. However, these studies provide limited

information on the influence of the presence of different health promotion programs that are external to, but partner with, schools on the quality of wellness policy within the different school districts. Understanding the extent to which government and non-government health promotion programs inform a school district's school health council in drafting and reviewing the wellness policies to ensure inclusiveness and action focus is important to help schools utilize resources and establish partnerships. Therefore, the gap in knowledge remains as how the presence of these various health promotion programs will reflect on the school wellness policy in terms of strength and comprehensiveness in providing practical guidelines that inform the policy development process within school districts in the State of Oklahoma.

CHAPTER III

METHODS

This study focused on examining the relation between school district participation in health promotion programs and the school wellness policy quality within public school districts in the State of Oklahoma as measured for strength and comprehensiveness by the Rudd Center for Food Policy and Obesity WellSAT 2.0 assessment tool. The specific health promotion programs in this study included Certified Healthy Community, Certified Healthy School, Schools for Healthy Lifestyles, TSET-CXPAN, TSET Incentive Grant, Cooking for Kids, It's All About Kids and Alliance for a Healthier Generation. The request to conduct the research was approved by the Oklahoma State University Institutional Review Board (IRB) (Appendix C). The Oklahoma State Department of Education (OSDE) provided the researchers the approval to use the school district data.

Study design

The study used a descriptive cross-sectional study design based on pre-existing sampled school district quantitative data (secondary data) collected in the State of Oklahoma.

Sources of data

The study data included a secondary data set of school districts' SWPs section scores collected using the WellSAT 2.0 tool developed by Rudd Center for Food Policy and Obesity (Rudd Center for Food Policy & Obesity, 2017). The data were stored by the Oklahoma State Department of Education. Further, the data which reflected school districts' participation in the health promotion programs of interest were collected from program websites, program contact persons and offices and through Oklahoma State Department of Education, Child Nutrition Programs.

Study population

The secondary data set was drawn from the population of 545 approved public-school districts within the State of Oklahoma (Oklahoma State Department of Education (OSDE), 2017).

Sample size

The sample included the 344 school districts that received an administrative review of the Child Nutrition Programs during the 2015 and 2016 school years. Selection of the school districts by the OSDE was based on the time/period since the district's last review.

Health promotion programs categorization

The presence of health promotion programs within the different school districts was categorized using different methods to assess the relation between presence of health promotion programs and the strength and comprehensiveness of the school wellness policies as summarized below; -

Categorization of health promotion programs

Quantification of health promotion programs by school district

This study categorized the number of health promotion programs within school districts by manual interval levels. Manual interval quantification allowed for ranges between the data values to be set to the most appropriate intervals for analysis (ArcGIS Pro, 2017). For example, initially, for each school district, each health promotion program was coded as 0 if the program was not present in the school district, and 1 if the program was present during the 2015 or 2016 school years. The codes were summed to determine the total number of health promotion programs operating, or present, within the school district. The number of programs were then categorized into no program present, 1-2 programs present, 3-4 programs present, and 5 or more health programs present.

Categorization by type of health promotion program

The health promotion programs present within school districts were also categorized based on the similarity of the services provided and/or method of implementation of the health promotion program as a unifying factor. The categories of health promotion programs were titled using a key descriptive factor; policy driven health promotion programs included Alliance for a Healthier Generation, Certified Healthy Schools, Certified Healthy Communities and TSET-CXPAN. The health promotion program that provided for direct funding to school districts was the TSET Incentive Grant. A health promotion program based on culinary training included Cooking for Kids, which provided both culinary skill development training and assigned a chef to a school district. Health promotion programs based on direct implementation of nutrition

and physical activity education included Schools for Healthier Lifestyles and It's All About Kids.

Assessment of school wellness policy comprehensiveness and strength scores

School wellness policies for the school years 2015 and 2016 were electronically forwarded to Oklahoma State University researchers. Trained graduate research assistants reviewed the policies using the WellSAT 2.0 tool. Berg (2015) reported that the WellSAT 2.0 had an IRR of 0.99 and 0.97 for SWP comprehensiveness and strength respectively for sampled school districts in the State of Oklahoma. SWP section Scores were recorded in Excel data bases for preliminary data screening and ease of exporting to other software such as the Statistical Package for Social Scientists (SPSS) for detailed analysis based on the study objectives. For this study, the SWP comprehensiveness and strength scores were considered secondary data. Data for the assessment of the quality of SWP for the school districts for the years 2015 and 2016 in the State of Oklahoma was provided by the Oklahoma State Department of Education from schools that had completed an administrative review of the Child Nutrition Programs in the school years of our study's interest. Table 2 below showed the basis the scoring of the different policy sections using the WELLSAT 2.0 tool.

Table 2: Summary of score definitions by the WellSAT 2.0 assessment tool

<table>
<tr><th rowspan="2">Score</th><th rowspan="2">Rating</th><th rowspan="2">Description</th><th colspan="2">Assessment</th></tr>
<tr><th>Comprehensiveness</th><th>Strength</th></tr>
<tr><td>0</td><td>Not mentioned</td><td>Item totally not mentioned within the policy text</td><td></td><td rowspan="2"></td></tr>
<tr><td>1</td><td>Weak Statement</td><td>Rating assigned when item was mentioned but can’t be (easily) enforced, vague, confusing and unclear</td><td rowspan="2">Sum of policy scores “1” or “2” divided by 78 policy items x 100</td></tr>
<tr><td>2</td><td>Meets/ exceeds expectations</td><td>Rating assigned when item was mentioned and was easily enforceable, clear, enlisting commitment and action from the policy makers</td><td>Sum of only scores “2” divided by 78 policy items x 100</td></tr>
<tr><td colspan="5">(Rudd Center for Food Policy & Obesity, 2017)</td></tr>
</table>

Policy comprehensiveness

Comprehensiveness score defines the extent to which recommended content areas are covered in the policy. Comprehensiveness was calculated by counting the number of items in each section rated as “1” or “2,” dividing the result by the total number of policy items in all the sections (78) in the policy and multiplying this number by 100 (Rudd Center for Food Policy & Obesity, 2017).

Policy strength

The strength score describes how strongly the content was stated within the policy. Strength was calculated by counting the number of items in each section (78) rated as “2,” dividing the result by the total number of policy items in all the sections (78) in the policy and multiplying this number by 100 (Rudd Center for Food Policy & Obesity, 2017).

Inclusion criteria

All public schools within the school districts in the State of Oklahoma with both non-governmental and federally funded child nutrition programs were eligible for this study. School districts that submitted wellness policies to the Oklahoma State Department of Education as part of the administrative review process in school years 2015 and 2016 and were reviewed using the WellSAT 2.0 tool were included in the study.

Study variables

Independent variables

1. Geographic setting (urban, rural and mixed) of school districts.
2. Type (independent, dependent, charter, RCCI) of school districts.
3. Number of health promotion programs within the included school districts during the school years 2015 and 2016.
4. Type of health promotion programs within the included school districts during the school years 2015 and 2016.

Dependent variables

1. Strength of school wellness policy of school districts in the State of Oklahoma for the school years 2015 and 2016.
2. Comprehensiveness of school wellness policy of school districts in the State of Oklahoma for the school years 2015 and 2016.

Statistical analysis

Data analysis was done using the SPSS version 16 statistical package. Descriptive statistics for key aspects of the variables were performed with distribution and frequencies tabulated and calculated as a percentage of the total. Analysis of variance

(ANOVA) was performed to determine the differences between the mean scores of SWP comprehensiveness and strength for the different ranked numbers and types of health promotion programs. Chi-square was used to test for the difference in proportion between school district type, geographic setting and ranked number of health promotion programs. Statistical significances was set at $p \leq 0.05$.

CHAPTER IV

INFLUENCE OF HEALTH PROMOTION PROGRAMS ON QUALITY OF SCHOOL WELLNESS POLICY

Abstract

Schools are an optimum environment to address health outcomes of children. Schools participating in federal Child Nutrition Programs are required to have a school wellness policy (SWP). Numerous organizations have developed health promotion programs to address school health environments through various approaches including nutrition services, nutrition and physical activity education and policy adoption. In general, research focusing on the presence of health promotion programs' relation to SWPs is lacking. The purpose of this study was to determine the influence of presence of health promotion programs on the comprehensiveness and strength of SWPs in a sample of Oklahoma school districts during school years 2015 and 2016.

A sample of 344 school districts in the State of Oklahoma was used in this study. WellSAT 2.0 assessment tool was used to evaluate the strength and comprehensiveness of SWPs. Interrater reliability of 0.99 and 0.97 for SWP comprehensiveness and strength assessment tool was found for this study. School districts' participation data in health promotion programs during our study period was collected

from program websites, contact persons and the Oklahoma State Department of Education. ANOVA was used to compare means of SWP scores for each of the independent variables and chi-square was used to test for the difference in proportion between specific study variables. SWPs had a mean comprehensiveness score of 43.7 percent and a mean strength score of 21.8 percent. Overall, school districts participated in a mean of 2.0 health promotion programs. There were no significant differences in comprehensiveness or strength scores by school district geographic location or school district type or ranked number of health promotion programs; within or between types of health promotion programs. There was a difference in the proportion of health promotion programs in school districts by geographic setting ($p = .01$) and district type ($p = .00$). Presence of health promotion programs did not explain differences in quality of districts' written SWP. When reviewing and revising SWPs, school districts should ensure that policies reflect practices and wellness programming within the district to improve SWP quality; as such, the best practices will be specifically stated in the SWPs.

Introduction

Child health concerns related to undernutrition, and more recently obesity, have long been public health concerns in the United States (Ogden et al., 2014). Health promotion programs operating within school districts support school systems through promoting educational opportunities and improving the learning environment of school-age children (Hager et al., 2016). For example, some of the health promotion programs provide policy guidance to school districts on nutrition standards for foods and beverages in and around school environments (Alliance for a Healthier Generation, 2017). Such efforts by external collaborators adapt to the Elementary and Secondary Education Act (ESEA) which was reauthorized by the Every Student Succeeds Act (ESSA) of 2015, which prioritizes school-age child wellness through funding for school agencies to address educational needs with school child feeding placed among the priorities (Lueke, 2011; FRAC, 2012).

The USDA requires school districts participating in the Child Nutrition Programs to have a school wellness policy to use as a fundamental tool to promote healthy school environments and reduce childhood obesity (Nanney & Davey, 2008; Briggs, Safaii & Beall, 2003). The wellness policies must include goals for nutrition promotion and education, physical activity, and other activities that bolster school-age child wellness. Local school food authorities (LSFAs) oversee school feeding programs in line with school wellness policies. Further, local education agencies (LEAs) are required under the Healthy Hunger-Free Kids Act (HHFKA) 2010, Sec. 204 to meet the local school wellness policy (USDA, 2017b). This mandate strengthens the Child Nutrition and Special Supplemental Nutrition Program for Women, Infants and Children (WIC)

Reauthorization Act guidelines on the requirement of school wellness policies by all school district implementing federally funded school meal programs (Sec. 204 of Public Law 108-265).

The HHFKA 2010, updated the administrative review process of the SWP. Reviews to evaluate the school nutrition programs are conducted in a three-year cycle by the state administrative agency to ensure HHFKA program requirement implementation (USDA, Food and Nutrition Service, 2016). These reviews primarily focused on LSFAs operations and assured policy included required components; they did not evaluate the strength and comprehensiveness of the policy. Recognizing the need for a systemic and rigorous policy review process, researchers began assessing local wellness policies and identified that a challenge still exists on the quality of the wellness policies in terms of strength and comprehensiveness to enable school authorities to address school-age child health promotion (Rudd Center for Food Policy & Obesity, 2017; Chriqui et al., 2013; Lucarelli et al., 2015).

To assist schools in writing and implementing strong and comprehensive policies, many health promotion programs supported by multiple government and non-government organizations have emerged. In the State of Oklahoma these include, but are not limited to, Cooking for Kids, Alliance for a Healthier Generation, It's All About Kids, Certified Healthy Schools, Certified Healthy Community, Oklahoma Tobacco Settlement Endowment Trust (TSET) Incentive grant, Tobacco Settlement Endowment Trust Communities of Excellence in Physical Activity and Nutrition (TSET-CXPAN) and Schools for Healthy Lifestyle (Appendix A). Hager et al. (2016) suggested that due to limited resources and competing priorities, schools and school systems should collaborate

with other organizations to ensure full implementation of local wellness policies. The presence of health promotion programs may support and incentivize school districts and their respective schools in developing strong and comprehensive wellness policy and perhaps subsequent implementation of the policy that would promote school child health (Hager et al., 2016). Research is limited on the influence of the presence of health promotion programs and the quality of school wellness policy that affects school-age child nutrition and health.

Against that background, this study was designed for school districts within the State of Oklahoma whose public schools' wellness policies had been reviewed for the school years 2015 to 2016. Therefore, the aim of the study was twofold: 1) to describe the policy strength and comprehensiveness of a sample of Oklahoma school districts' school wellness policies as measured by the WellSAT 2.0 policy assessment tool and 2) to examine the relation between the presence of different health promotion programs in schools on the strength and comprehensiveness of the respective school district wellness policies during school years 2015 and 2016. The specific objectives of the study were to:

1. Describe the strength and comprehensiveness of Oklahoma school districts SWP.
2. Compare SWP strength and comprehensiveness scores based on geographic setting of the school districts.
3. Compare SWP strength and comprehensiveness scores based on type of the school districts.
4. Determine the level of participation of school districts in different school health promotion programs.

5. Compare SWP strength and comprehensiveness scores based on number of health promotion programs in the school districts.
6. Compare the SWP strength and comprehensiveness scores based on the types of health promotion programs in the school districts.

Methods

This study focused on examining the relation between school district participation in health promotion programs and the school wellness policy quality within public school districts in the State of Oklahoma as measured for strength and comprehensiveness by the Rudd Center for Food Policy and Obesity WellSAT 2.0 assessment tool. The specific health promotion programs in this study included Certified Healthy Community, Certified Healthy School, Schools for Healthy Lifestyles, TSET-CXPAN, TSET Incentive Grant, Cooking for Kids, It's All About Kids and Alliance for a Healthier Generation. The request to conduct the research was approved by the Oklahoma State University Institutional Review Board (IRB). The Oklahoma State Department of Education (OSDE) provided the researchers the approval to use the school district data.

The study used a descriptive cross-sectional study design based on pre-existing sampled school district quantitative data (secondary data) collected in the State of Oklahoma. The study data included a secondary data set of school districts' SWPs section scores collected using the WellSAT 2.0 tool developed by Rudd Center for Food Policy and Obesity (Rudd Center for Food Policy & Obesity, 2017). The data were stored by the Oklahoma State Department of Education. Further, the data which reflected school districts' participation in the health promotion programs of interest were collected from program websites, program contact persons and offices and through Oklahoma State

Department of Education, Child Nutrition Programs. School wellness policies for the school years 2015 and 2016 were electronically forwarded to Oklahoma State University researchers. Two trained graduate research assistants reviewed the policies using the WellSAT 2.0 tool, with an interrater reliability (IRR) of 0.99 and 0.97 for SWP comprehensiveness and strength respectively (Berg, 2015), for sampled school districts in the State of Oklahoma. SWP Comprehensiveness score defines the extent to which recommended content areas are covered in the policy. Comprehensiveness of policies was calculated by counting the number of items in each section rated as "1" for a weak statement or "2" for a statement that met or exceeded expectation, then dividing the result by the total number of policy items in all the sections (n=78) in the policy and multiplying this number by 100 (Rudd Center for Food Policy & Obesity, 2017). The strength score describes how strongly the content was stated within the policy. Strength of policies was calculated by counting the number of items in each section (n=78) rated as "2," dividing the result by the total number of policy items in all the sections (n=78) in the policy and multiplying this number by 100 (Rudd Center for Food Policy & Obesity, 2017).

This study categorized the number of health promotion programs within school districts by manual interval levels. Manual interval quantification allowed for ranges between the data values to be set to the most appropriate intervals for analysis (ArcGIS Pro, 2017). For example, initially, for each school district, each health promotion program was coded as 0 if the program was not present in the school district, and 1 if the program was present during the 2015 or 2016 school years. The codes were summed to determine the total number of health promotion programs operating, or present, within

the school district. The number of programs were then categorized into no program present, 1-2 programs present, 3-4 programs present, and 5 or more health programs present. Further, the health promotion programs present within school districts were also categorized based on the similarity of the services provided and/or method of implementation of the health promotion program as a unifying factor. The categories of health promotion programs were titled using a key descriptive factor; policy driven health promotion programs included Alliance for a Healthier Generation, Certified Healthy Schools, Certified Healthy Communities and TSET-CXPAN. The health promotion program that provided for direct funding to school districts was the TSET Incentive Grant. A health promotion program based on culinary training included Cooking for Kids, which provided both culinary skill development training and assigned a chef to a school district. Health promotion programs based on direct implementation of nutrition and physical activity education included Schools for Healthier Lifestyles and It's All About Kids.

The secondary data set was drawn from the population of 545 approved public-school districts within the State of Oklahoma (Oklahoma State Department of Education (OSDE), 2017). The sample included the 344 school districts that received an administrative review of the Child Nutrition Programs during the 2015 and 2016 school years. Selection of the school districts by the OSDE was based on the time/period since the district's last review. All public schools within the school districts in the State of Oklahoma with both non-governmental and federally funded child nutrition programs were eligible for this study. School districts that submitted wellness policies to the Oklahoma State Department of Education as part of the administrative review process in

school years 2015 and 2016 and were reviewed using the WellSAT 2.0 tool were included in the study.

The independent variables used in this study included school district geographic setting (urban, rural and mixed), type (independent, dependent, charter, residential child care institutions (RCCI)) of school districts, number of health promotion programs and type of health promotion programs within the included school districts during the school years 2015 and 2016. The dependent variables for this study were strength of school wellness policy and comprehensiveness of school wellness policy of school districts in the State of Oklahoma for the school years 2015 and 2016.

Data analysis was done using the SPSS version 16 statistical package. Descriptive statistics for key aspects of the variables were performed with distribution and frequencies tabulated and calculated as a percentage of the total. Analysis of variance (ANOVA) was performed to determine the differences between the mean scores of SWP comprehensiveness and strength for the different ranked numbers and types of health promotion programs. Chi-square was used to test for the difference in proportion between school district type, geographic setting and ranked number of health promotion programs. Statistical significances was set at $p \leq 0.05$.

Results

School district setting and school type

School districts included in this study were located within different geographic settings identified under rural, urban or mixed settings. Additionally, there were different categories/ types of school districts (i.e., independent, dependent, charter and RCCIs) with different administrative structure as shown in table 3 below.

Table 3: Frequency of school districts by geographic setting and school district type

Total N=344		**Frequency**	**Percent**
School district by school district geographic setting	Rural	276	80.2
	Mixed	17	4.9
	Urban	51	14.8
School district by school district type	Independent	266	77.3
	Dependent	49	14.2
	Charter	24	7.0
	RCCI*	5	1.5

* Residential child care institutions

Most of the school districts (80.2 percent, n = 276) were in rural settings, followed by 14.8 percent (n=51) in urban settings and 4.9 percent of the school districts (n = 17) were in a mixed setting in the State of Oklahoma.

Our study also showed that majority of the school districts were of the independent type (77.3 percent), 14.2 percent were dependent type school districts and 7.0 percent of the school districts were charter type schools. RCCIs composed only 1.5 percent of the school districts included in the study.

School Wellness Policy quality

The WellSAT 2.0 was used to assess the quality of school wellness policy for six topics using two indicators, comprehensiveness and strength. Possible scores ranged from 0 to 100 percent, with a higher score indicating higher quality of the wellness policy. Comprehensiveness described the extent to which recommended elements were addressed in the policy, while strength described the vagueness versus specificity of the language used in the wellness policy.

SWP quality scores by section

Table 4: SWP scores by policy section

Total N = 344	Policy section	Mean	SD (±)
SWP comprehensiveness	Nutrition education	86.0	22.4
	School meals	48.6	19.0
	Nutrition standards	46.9	26.7
	Physical education and physical activity	26.1	21.1
	Wellness promotion and marketing	40.1	25.5
	Implementation, evaluation and communication	44.2	27.5
	Overall policy comprehensiveness	**43.7**	**17.7**
SWP strength	Nutrition education	42.5	33.2
	School meals	31.0	15.5
	Nutrition standards	14.8	16.7
	Physical education and physical activity	11.2	12.5
	Wellness promotion and marketing	20.4	21.4
	Implementation, evaluation and communication	26.2	25.8
	Overall policy strength	**21.8**	**13.5**

School wellness policies analyzed in this study had a mean of 43.7 percent for the overall comprehensiveness, with the nutrition education section having the highest mean score of 86.0 percent. The physical education and physical activity section had the lowest mean value of 26.1 percent among the six sections.

Additionally, the overall strength amongst analyzed school wellness policies was reported with a mean of 21.8 percent. Similar to comprehensiveness scores, the nutrition education section had the highest mean score of 42.5 percent. The physical education and physical activity section had the lowest mean value, followed closely followed by nutrition standards section (11.2 and 14.8 percent, respectively).

SWP quality, school district setting and type

An ANOVA was performed to compare differences in the quality of the school wellness policy between the rural, mixed and urban school districts settings. Findings, presented in the table 5, indicated that there were no significant differences for either SWP comprehensiveness or SWP strength ($p > 0.05$) for the different school district settings (rural, mixed and urban).

Table 5: Analysis of variance for school district setting, comprehensiveness and strength of school wellness policy

Total N = 344		**N**	**Mean**	**SD (±)**	**Std. Error**	**F**	***p* value**
Policy comprehensiveness	Rural	276	43.4	18.5	1.1	.392	.68
	Mixed	17	42.3	18.1	4.4		
	Urban	51	45.6	12.4	1.7		
Policy strength	Rural	276	21.8	14.1	0.8	.003	.99
	Mixed	17	21.6	13.1	3.2		
	Urban	51	21.9	10.1	1.4		

Table 6 presents the ANOVA results for comparison of comprehensiveness and strength of the SWP by school district type. As with geographic setting, there were no significant differences in SWP comprehensiveness and the SWP strength scores ($p > 0.05$) by the school district types, that is independent, dependent, charter and RCCIs school district types.

Table 6: Analysis of variance for type of school district, comprehensiveness and strength of school wellness policy

Total N = 344		**N**	**Mean**	**SD (±)**	**Std. Error**	**F**	***p* value**
SWP Comprehensiveness	Independent	266	43.1	18.1	1.1	1.45	.23
	Dependent	49	47.2	17.3	2.5		
	Charter	24	46.0	14.8	3.0		
	RCCI	5	33.4	12.8	5.7		
SWP Strength	Independent	266	21.9	13.7	0.8	.94	.42
	Dependent	49	23.3	13.8	2.0		
	Charter	24	20.4	11.2	2.3		
	RCCI	5	13.3	6.7	3.0		

Level of participation of school districts in different school health promotion programs

The relation between health promotion programs and SWP quality was examined by analyzing both the categories of the number of total programs as well as categorization of different types of programs based on similarity of services provided (i.e., homogeneity in services or design) present in a school district.

Number of health promotion programs

The number of health promotion programs present within a school district were summed to acquire a cumulative number that was manually ranked (i.e., 0 programs, 1-2 programs, 3-4 programs, and > 5 programs) to provide an in-depth numerical analysis of the health promotion programs present within school districts. Table 7 summarizes proportion of school districts by the number of programs present in the district.

Table 7: Number of health promotion programs present within a school district

Number of health promotion programs present in a school district	# of districts Total N = 344	Percent
No program	91	26.5
1-2 programs	170	49.4
3-4 programs	78	22.7
5 and more programs	5	1.5

Almost half of the school districts (49.4 percent) included in this study participated in 1-2 health promotion programs, 26.5 percent did not participate in a health promotion program and 24.2 percent participated in 3 or more programs. Additionally, the mean number of programs a school district participated in was 2.0 with a standard deviation of 0.74.

Chi-square test for ranked number of health promotion programs present, geographic setting and type of school district

The chi-square results, presented in table 8, show that there was a significant difference in the proportion of school districts by geographic setting and ranked number of health promotion programs ($p = .01$) As reflected in figure 2, rural districts represented the high proportion of each category of number of health programs. Likewise, the results also showed that there was a difference in the proportion of districts identified as independent, dependent, charter and RCCIs ($p = .00$). Figure 3 demonstrated that generally, independent school districts had a larger proportion for each of the ranked number of health programs compared to other school district types.

Table 8: Chi-square test for ranked number of health promotion program present, geographic setting and type of school district.

		Value	df	Asymp. sig. (2-sided)
School district geographic setting	Pearson chi-square	13.42a (X^2)	4	.01
	Likelihood ratio	12.53 (X^2_λ)	4	.01
	Linear-by-linear Association	7.87	1	.01
	N of valid cases	253*		

a. 4 cells (44.4percent) have expected count less than 5. The minimum expected count is .28.

		Value	df	Asymp. sig. (2-sided)
School district type	Pearson chi-square	16.15a (X^2)	6	.01
	Likelihood ratio	18.87 (X^2_λ)	6	.00
	Linear-by-linear Association	2.52	1	.11
	N of valid cases	253*		

a. 8 cells (66.7percent) have expected count less than 5. The minimum expected count is .08.

*represents the school districts that had health promotion programs present out of the total 344 included in the study

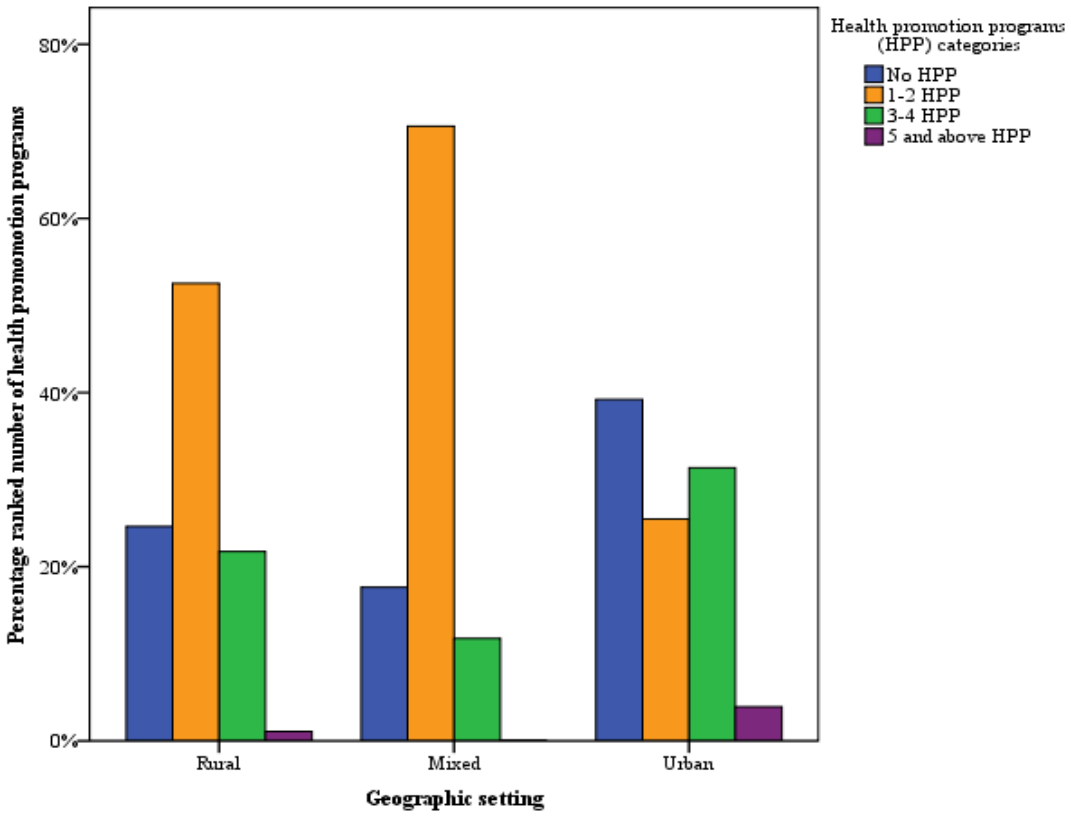

Figure 2: Ranked number of health promotion programs by school district geographic setting

Detailed findings of the ranked number of health promotion programs in school districts by geographic setting were illustrated in Figure 2. The results showed that urban school districts had the highest percentage (39.2 percent) of school districts without any health promotion program present within the geographic setting categories, followed by rural and mixed school districts (24.6 and 17.6 percent respectively). Mixed school districts had the most representation (70.6 percent) of 1-2 health promotion programs present, followed by rural and urban school districts (52.5 and 25.5 percent respectively). The results further showed that urban school districts had the highest portion (31.4 percent) of 3-4 health promotion programs present followed by rural and then mixed school districts (21.7 and 11.8 percent respectively). Additionally, the findings showed that urban school districts were most represented (3.9 percent) in terms of presence of 5

or more health promotion programs followed by rural school districts (1.1 percent) and none of the mixed school districts had 5 or more health promotion programs present.

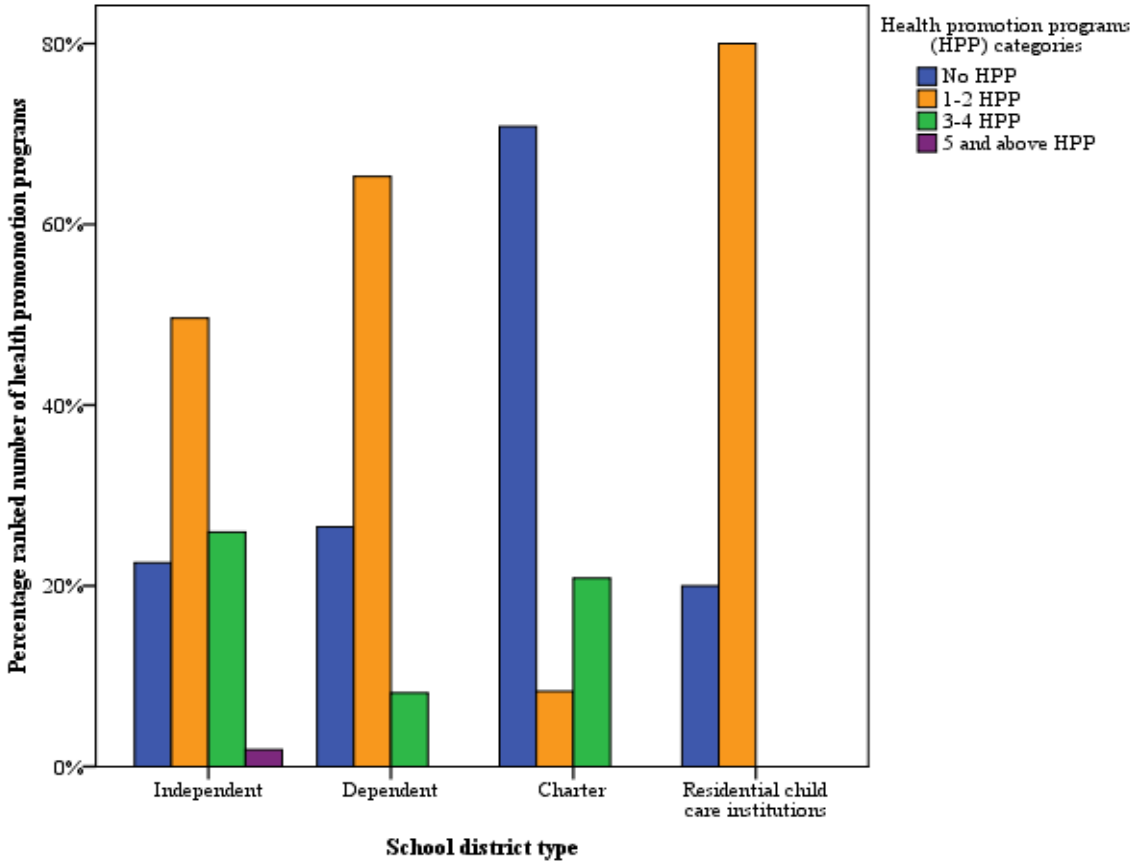

Figure 3: Ranked number of health promotion programs by school district type

Findings of the ranked number of health promotion programs for each type of school district were illustrated in Figure 3. The highest number (70.8 percent) of charter school districts did not have any health promotion program present, followed by 26.5 percent within the dependent school districts and then closely followed by independent school districts and RCCIs (22.6 and 20 percent respectively). Further, RCCIs had the highest representation (80 percent) of 1-2 health promotion programs present within a ranked category compared to 65.3 percent of the dependent school districts, followed by 49.6 percent and 8.3 percent of the independent and charter school districts respectively.

Independent school districts had the highest (25.9 percent) of the 3-4 health promotion programs followed by charter school districts (20.8 percent), then followed by dependent school districts (8.2 percent) and none within the RCCIs. Our results showed that only 1.9 percent independent school districts had 5 or more health promotion programs within their category and no other school district types had any school districts in this health program classification within their respective categories.

Types of health promotion programs within a school district

The health promotion programs present within a school district were categorized based on the similarity of the services provided and/or method of implementation of the health promotion program as a unifying factor which enabled an in-depth numerical analysis of the health promotion program type ranks within school districts. The results in table 9 show the majority (65.4 percent) of school districts participated in policy driven-based health promotion programs, followed by 23.3 percent of the school districts (n = 80) that participated in culinary training-based health promotion programs, 9.0 percent of the school districts (n = 31) had schools participating in direct funding-based school health promotion programs, and 7.3 percent of the school districts (n = 25) participated in direct nutrition and physical activity-based health promotion programs.

Table 9: School districts participating in different types of school health promotion programs

Health promotion programs category ranked by type	Frequency*	Percent
Culinary training-based program	80	23.3
Direct funding-based program	31	9.0
Policy driven-based program	225	65.4
Direct nutrition and physical activity-based program	25	7.3

* Health promotion program total (361) is different from the sample total of 344 due to some districts having schools participating in more than one type of health promotion program.

Comparison of school wellness policies quality by number and type of school health promotion programs

The results presented below compared the quality of the SWP in different school districts and the school health promotion programs ranked by number and type.

SWP strength, comprehensiveness scores and health promotion programs ranked by number in the school districts

The results in table 10 show the ANOVA results for comparing the mean scores for SWP comprehensiveness and strength by the ranked number of health promotion programs for the different school districts in the State of Oklahoma. There were no significant differences in the mean scores for either the school wellness policy comprehensiveness or strength ($p > .05$) for the different number of health promotion programs present in a school district. The results in table 10 show that school districts with 5 and more health promotion programs had the highest mean score for SWP comprehensiveness and strength at 49.9 and 24.3 percent respectively while school districts without any health promotion program present had the least mean score for SWP

comprehensiveness and strength at 42.0 and 20.0 percent respectively, but these differences were not significant.

Table 10: SWP comprehensiveness and strength scores between ranked number of health promotion programs present in a school district.

	# of health programs	N	Mean	SD (±)	Std. error	F	*p* value
SWP Comprehensiveness	None	91	42.0	17.2	1.8	.786	.50
	1 - 2	170	43.6	18.3	1.4		
	3 - 4	78	45.6	17.3	2.0		
	5 and more	5	49.9	15.9	7.1		
SWP Strength	None	91	20.0	12.8	1.3	.898	.44
	1 - 2	170	22.2	13.9	1.1		
	3 - 4	78	23.1	13.5	1.5		
	5 and more	5	24.3	8.2	3.7		

SWP strength, comprehensiveness scores and ranked type of school health promotion programs in the school districts

The results in table 11 show the analysis of variance (ANOVA) results comparing SWP comprehensiveness and strength scores using type of health promotion programs within the sampled school districts as the independent variable. The results presented in table 11 show that there were no significant differences in mean scores for either the school wellness policy comprehensiveness or strength ($p > .05$) regarding the presence of different types of health promotion programs ranked in the school districts included in this study. There was no statistical difference in the mean SWP comprehensiveness and strength scores among the school districts included in this study that had different health promotion programs present or absent.

Table 11: Comparison of SWP comprehensiveness and strength scores within type of health promotion programs ranked within school districts.

Program type			**N**	**Mean**	**SD (±)**	**F**	***p* value**
Culinary training-based program category	SWP comprehensiveness	program absent	264	43.7	17.3	.010	.92
		program present	80	43.9	19.0		
	SWP strength	program absent	264	21.7	13.5	.045	.83
		program present	80	22.1	13.4		
Direct funding-based program category	SWP comprehensiveness	program absent	313	43.2	17.6	2.605	.10
		program present	31	48.6	18.5		
	SWP strength	program absent	313	21.4	13.4	3.188	.07
		program present	31	25.9	14.4		
Policy driven based-program category	SWP comprehensiveness	program absent	119	41.9	17.8	1.992	.16
		program present	225	44.7	17.6		
	SWP strength	program absent	119	20.3	13.1	2.391	.12
		program present	225	22.7	13.6		
Direct nutrition & physical activity-based program category	SWP comprehensiveness	program absent	319	43.4	18.0	1.601	.21
		program present	25	48.0	13.8		
	SWP strength	program absent	319	21.8	13.6	.155	.69
		program present	25	22.9	12.1		

Findings in table 12 showed that the main effects of presence of type of health promotion program were not significant (p >.05) for the school wellness policy strength among the school districts included in this study. The interaction of the type of health promotion programs ranked in the school districts also had no significant difference (p >.05) in the school wellness policy strength. Additionally, there was no significant difference in the scores of SWP strength in the school districts where the different types

of health promotion programs (culinary training-based program, policy driven-based program, direct nutrition & physical activity-based program and direct incentive-based program) were present.

Table 12: Comparison of SWP strength between type of health promotion programs among school districts.

Dependent Variable: SWP strength					
	Type III sum of squares	**df**	**Mean square**	**F**	***p* value**
Corrected Model	4374.6[a]	29	150.8	.79	.78
Intercept	14789.9	1	14789.9	76.97	.00
Culinary training-based program	543.1	2	271.5	1.41	.25
Policy driven-based program	198.1	4	49.5	.26	.91
Direct nutrition & physical activity-based program	2.5	1	2.5	.01	.91
Direct funding-based-program	291.1	1	291.1	1.52	.22
Culinary training-based program*Policy driven-based program*Direct incentive-based program*Direct nutrition & physical activity-based program	2968.5	21	141.4	.74	.79
Error	42849.1	223	192.1		
Total	175286.5	253			
Corrected Total	47223.7	252			

a. R Squared = .093 (Adjusted R Squared = -.025)

The results presented in table 13 show that the main effects of presence of type of health promotion program were not significant (p >.05) for SWP comprehensiveness among the school districts. There was no significant difference in the scores of SWP comprehensiveness in the school districts where the different types of health promotion programs (culinary training-based program, policy driven-based program, direct nutrition & physical activity-based program and direct incentive-based program) were present.

Table 13: Comparison of SWP comprehensiveness between type of health promotion programs ranked among school districts.

Dependent Variable: SWP comprehensiveness					
	Type III sum of squares	**df**	**Mean square**	**F**	***p* value**
Corrected model	6966.6[a]	29	240.2	.73	.85
Intercept	63331.05	1	63331.05	191.01	.00
Culinary training-based program	1119.4	2	559.7	1.69	.19
Policy driven-based program	490.1	4	122.5	.37	.83
Direct nutrition & physical activity-based program	254.7	1	254.7	.77	.38
Direct funding-based program	763.1	1	763.1	2.3	.13
Culinary training-based program*Policy driven based program*Direct incentive-based program*Direct nutrition & physical activity-based program	4510.8	21	214.8	.65	.88
Error	73938.3	223	331.6		
Total	578351.8	253			
Corrected total	80904.9	252			

a. R Squared = .086 (Adjusted R Squared = -.033)

Discussion

Our study examined the quality of school wellness policies measured by strength and comprehensiveness for sampled public school districts for school years 2015 and 2016. It also focused on the presence of health promotion programs in the school districts, specifically the nine health promotion programs were categorized and studied to determine the influence of presence of the health promotion programs on the quality of school wellness policy.

School districts were located among different geographic settings. Our findings determined that most (80.2 percent) of the school districts were in rural areas while the

least number (4.9 percent) of school districts were in mixed setting. Similar to our study, the Institute of Education Sciences (2014) reported the majority (73.5 percent) of school districts in the State of Oklahoma were located within a rural or small-town setting, 14.3 percent in an urban setting and only 12.2 percent in a mixed setting. Furthermore, the findings in this study on distribution of school districts by type showed the majority (77.3 percent) of the sampled school districts were independent school districts with the fewest (1.5 percent) school districts represented as RCCIs. These findings were consistent with the U.S. Department of Education report (2016) and the OSDE (2017) records which reported that independent school districts were the most widespread school-age children educational institutions with 75 percent representation while charter school districts together with RCCIs formed the least prevalent (1 percent) school districts in the State of Oklahoma.

This study also determined that school wellness policy quality among school districts in the State of Oklahoma was below 50 percent, specifically, the mean SWP comprehensiveness score was reported at 43 percent and the mean SWP strength score was lower at 21 percent. The findings were consistent with other studies using the WellSAT tool that described low SWP quality scores (Lucarelli et al., 2015; Chriqui et al., 2013; Schwartz et al., 2012). A cross-sectional study on nutrition practices and SWP (Lucarelli et al., 2015) reported 40 percent and 19 percent mean scores for SWP comprehensiveness and strength, while an evaluation of 151 school districts' SWPs (Schwartz et al., 2012) reported slightly higher mean scores at 55.1 percent and 38.4 percent for SWP comprehensiveness and strength respectively. Consistently, a nationwide evaluation of school wellness policies (Chriqui et al., 2013) also reported low

SWP comprehensiveness and strength scores at 48 percent and 28 percent respectively although the same report indicated that even though most school districts had low scores for both SWP strength and comprehensiveness, there had been small but steady improvements in the mean SWP scores over the past five years of that study since the wellness policy had been mandated within local education agencies (LEAs). Low SWP scores were due to vague language used in the wellness policies, that is lack of specificity in language for the various policy components. For example, Lucarelli et al. (2015, p. 196) mentioned that weak wellness policy scores were mostly attributed to unclear statements such as "would offer and promote healthy foods in all areas" included in respective sections of the wellness policies.

Further, our study specifically established that under both SWP attributes, comprehensiveness and strength, the nutrition education section had the highest mean comprehensiveness and strength score (86.0 and 42.5 percent respectively) among the six policy sections. These findings were corroborated by Lucarelli et al. (2015) and Chriqui et al. (2013) who reported that the nutrition education section had the most comprehensive and strong provisions among the SWP sections in their studies. The WellSAT 2.0 tool showed under the nutrition section in specific section wordings such as "links nutrition education with school environment" and "nutrition education teaches skills that are behavior-focused" were required to have stronger nutrition education policy section which could be attributed to the presence of health promotion programs (Appendix A). Moreover, all health promotion programs in our study directly or indirectly addressed nutrition education among the services provided in the school districts (Appendix A).

In contrast, the physical education and physical activity section had the lowest comprehensiveness and strength scores (26.1 and 11.2 percent, respectively) among all SWP sections for school districts in our study. This was possibly related to the presence of only two health promotion programs that primarily focused on physical education and physical activity (that is, Schools for Healthier Lifestyles and It's All About Kids). This implied that school districts were not sufficiently making provisions for the physical education and physical activity section. The State of Oklahoma has emphasized that all institutions especially school agencies uphold the state regulation under the Senate bill 312 requiring school-age children to be engaged in a minimum of 60 minutes physical education weekly and/or the Senate bill 1186 that requires an extra 60 minutes of physical activity for full-day kindergarten children and school-age children, grade one through five (Oklahoma State Department of Education, 2015). Our findings under this policy section suggest the need to further investigate the reasons behind the low physical education and physical activity section scores among school districts amidst such specific regulations and the standard integration of physical activity and exercise in the routine academic curriculum. For example, are schools allowing too many exemptions from physical activity and education courses, is it due to lack of resources, lack of time in the school schedule, too much emphasis on academic requirements, insufficient qualified physical education staff to mention but a few.

The current study also reported low mean strength scores (14.78 percent) for nutritional standards for the competitive foods section. These low scores were consistent with reports from other studies (Lucarelli et al., 2015; Chriqui et al., 2013) on nutritional standards for competitive foods in school environments. Lucarelli et al. (2015) reported a

5 percent mean strength score while Chriqui et al. (2013) in a national evaluation study of SWP also reported nutritional standards for competitive foods as the lowest scoring section denoting a small increase of the mean strength scores from 12 to only 20 percent in the five-year period investigated in that study. The low nutritional standards for competitive foods strength score was possibly because our study used data collected for the school years 2015 through 2016 which coincided with the initial implementation of the Smart Snacks in Schools regulations that were authorized by the HHFKA 2010 (July 1, 2014). It is possible that the policies reviewed were adopted by the LEAs prior to the release of the Smart Snacks in Schools regulations. The HHFKA 2010 required updated school wellness policies to include provisions for development of nutrition standards for competitive food among school districts participating in child nutrition programs (USDA, 2013). While the newer provisions may not have been sufficiently reflected within the written policy in our study, a review of actual practices within the district would show the school district was acting on the updated nutrition standards through engagement with health promotion program institutions/ organizations. For example, health promotion programs such as the Alliance for a Healthier Generation and TSET incentive grants would address competitive food services in school environments thus supporting setting up healthier food systems such as vending machines, school fundraiser foods and classroom celebrations foods and beverages (Appendix A).

There was no significant difference in mean comprehensiveness or strength scores by school district geographic settings or type ($p > 0.05$). This study's findings were consistent with the nationwide evaluation of SWP trends of 2006 – 2014 (Piekarz et al., 2016) that reported that school district setting/locale did not show any significant

differences in the wellness policy quality. Our findings could be related to the fact that our sample size was largely composed of school districts in a rural geographic setting.

Our study further revealed that one in four school districts (26.5 percent) did not participate in any health promotion programs. This was likely associated with low efforts by school districts to lobby for or engage in various health promotion programs around the state and country. The USDA, Food and Nutrition Service (2004) reported that some school districts did not take an extra initiative in diversifying approaches towards promotion of school-age child health and wellness through collaborations with other health promotion programs beyond the School Breakfast Program (SBP) and the National School Lunch Program (NSLP). Additionally, our findings reported that almost half (49.4 percent) of school districts had one or two health promotion programs, and the smallest percentage (24.2 percent) of the school districts had three or more health promotion programs with an overall mean participation in two health promotion programs. Participation in few programs could impact on the diversity of influence that health promotion programs provide towards the schools' system and wellness policy because of their specificity of service delivery (Appendix A). Further, our study showed that based on proportions within categories, urban school districts had higher percentage of school districts without health promotion programs and higher percentage of school districts with more than 3 health promotion programs present compared to rural and mixed school districts. The U.S. Census Bureau (2010) defines urban settings as locations that had more than 2,500 persons and less residential areas. This implied that urban school districts had more student enrollment thus more health promotion programs to have a higher program output and impact in relation to school-age child health. Furthermore, a

higher percentage of independent school districts in our study had 3 and more health promotion programs present compared to all other school district types. Additionally, independent school districts had the second smallest number of no programs present after RCCIs compared to dependent and charter school district types. These findings showed that generally independent school districts had more health promotion programs present by school district type comparison. Because independent school districts serve grades Kindergarten through 12 and generally have a higher student enrollment compared to other types of schools, they may have more health promotion programs present to reach more school age-children and have higher impact on childhood and adolescent wellness. Further, the higher presence of health promotion programs in independent school districts was possibly due to a larger staff size, and thus increased capacity to engage with external organizations compared to dependent, charter school districts and RCCIs. Independent school districts operate towards developing the whole child, while charter schools mainly focus on the academic mission (Nelson & Hollenbeck, 2001). For example, many charter schools use online classroom formats which limit activities that influence child health such as physical activity.

In the current study, the majority (65.4 percent) of school districts participated in one or more policy driven-based health promotion programs while the least number of school districts (7.3 percent) participated in one or more direct nutrition and physical activity-based school health promotion programs. The moderately-high (65.4 percent) participation in policy driven health programs possibly influenced school districts in addressing school-age child nutrition policy aspects in the wellness policy such as nutrition education which was the highest scoring policy section for provision and

specificity of policy language (86.0 and 42.5 percent, respectively). This was consistent with the Hager et al. (2016) study which reported that school agencies and institutions provided an opportunity to improve and implement wellness policies through collaboration. Additionally, few school districts (7.3 percent) participated in the direct nutrition education and physical activity health promotion programs in our study. These findings possibly show that efforts by school districts to address physical activity for school-age children are still poor. As earlier mentioned, the federal government recommends a minimum of 60 minutes of physical activity daily for school-age children (CDC, 2016). Further, the State of Oklahoma reemphasizes the recommendation through its mandate under the Senate Bill 312, section 1(b) requiring at least 60 minutes of physical education weekly inclusive of physical exercise for school-age children and further under Senate Bill 1186, section 1(d), requires an extra 60 minutes of physical activity inclusive of aspects on wellness and nutrition education for full-day kindergarten children (OSDE, 2015). The reason for the low physical education and physical activity section scores for school districts in the State of Oklahoma requires further investigation. Nevertheless, the findings in this study are consistent with the national School Health Policies and Programs (SHPP) study (Lee et al., 2007) which reported that while most school districts adopted physical education related items in their wellness policies, few school districts provided physical education and physical activity to their students, they further stated that many schools exempted many students from physical activity and staff development regarding physical activity was not prioritized. This may explain why school districts did not sufficiently describe and use specific language on physical activity elements in the policies. The HHFKA 2010 s. 204, reinforced earlier laws on

school-age child physical activity requiring local school agencies to stipulate goals for physical activity to promote school-age child wellness (USDA, 2016). The implementation of the HHFKA 2010 rule provides an opportunity for school agencies and partner organizations/ institutions which promote health programs to not only strongly address physical education and physical activity in school wellness policies, but to engage staff and students in achieving the objectives of the section provision.

A systems survey on implementation of local wellness policies among 1,349 public schools (Hager et al., 2016) reported that school districts with perceived system support had better outcomes on addressing local wellness policies. However, our study showed that there was no significant difference for either SWP comprehensiveness or strength scores by the presence of different types of health promotion programs or the number of school health promotion programs within the school districts ($p > 0.05$). Our differences with findings from a recent study (Hager et al., 2016) may be explained by earlier studies (Brener et al., 2004; Nollen et al., 2007) which reported that local school wellness policies were developed by school district health councils composed of a limited number of community members who may have drafted policies based on sample policy drafts (USDA, Food and Nutrition Service, 2004). This may not be reflective of the local situation of the school districts, or descriptive enough to define the expectations for the school health environment. Persons drafting school wellness policies may be unlikely to interface with various school nutritional professionals and technical persons implementing or managing health promotion programs in the school districts to provide input which would increase policy provisions and specific/strong language, for example using words or phrases such as; are required, will meet, or prohibits to mention but a few.

Our study findings suggest that school health council members may not necessarily be conversant with the different health promotion programs being implemented in the school district. While health promotion programs have overreaching services beyond school sites, wellness policies were not updated on a regular basis to reflect the practices that could have resulted from health promotion programs implemented in the school district.

In summary, activities of health promotion programs are drafted with consideration to recent local and national policies. For example, as stated earlier, the HHFKA 2010 strengthened wellness policy requirements of school districts to address nutrition education, nutrition standards for foods sold in schools, physical activity, public participation, transparency and implementation of SWP (HHFKA, 2010). Organizations that manage health promotion programs consider such regulations that guide wellness activities in and around school environments while designing and drafting activities to support school-age child health. Addressing these regulations through collaboration and systems strengthening would improve the quality of school wellness policies and promote school-age child health especially through ending childhood and adolescent obesity. Moreover, the HHFKA 2010 mandate towards LSAs to conduct SWP evaluation within a three-year cycle would enable the school health councils and administrative review boards to strategize towards better described policy provisions with clear language for stronger wellness policies (USDA Food and Nutrition Service, 2016; Food and Nutrition Service, USDA, 2013).

Our study had some limitations. One was that the participation of school districts in health promotion programs was categorically limited to presence or absence of the

program based on the secondary data acquired and did not detail the extent to which the programs were being implemented in the various districts. In addition, the data used in this study were only based on public school districts that had their SWP evaluated for the school years 2015 and 2016; only 63 percent of the school districts were included in the study. This may not account for private schools participating in federally funded child nutrition programs in the State of Oklahoma that are required to have a SWP. However, the distribution of school districts included in our study by geographic location and type was representative of the state. Another limitation was that our study data was derived from a single state (Oklahoma), so findings may not be generalizable to other states. Nonetheless, as cited in our report, many of the key findings were consistent with national studies and studies from other states.

Conclusion

The prevalence of childhood and adolescent obesity remains the biggest public health concern in America (Johnson & Johnson, 2015). Moreover, the State of Obesity report (2017) ranked the State of Oklahoma ninth among all states and territories of America for the most prevalence of obesity. This emphasizes the need to reinforce existing strategies and collaborations for new or revised methods towards reducing the prevalence of obesity through development of comprehensive and strong wellness policies that are more likely to influence implementation of wellness practices.

Our study revealed that school wellness policy quality was only between low to moderate, less than 50 percent for both strength and comprehensiveness. While the HHFKA 2010 had only commenced its implementation during the period this study data

was collected for the school years 2015 and 2016, it provides a precedent for school districts and health promoting organizations to increase efforts towards improving school-age child health especially targeting low scoring sections of the school wellness policies. This study further determined that there was no significant difference for either school wellness policy comprehensiveness or strength scores by geographic setting or school district type.

The current study demonstrated that there was a significant difference in the number of health promotion programs by both school districts' geographic setting and type. This implied that the location of the school district was associated with the distribution of health promotion programs. This was possibly due to the need to have a higher output or impact by these health promotion programs, for example health promotion programs could target school districts in urban populations since they are expected to have a higher number of people (U.S. Census Bureau, 2010) thus reaching out to more school-age children. Urban school districts may also be easier to attract staff compared to the mixed and rural school districts. Additionally, our study demonstrated that most school districts had a mean participation in two health promotion programs. However, a quarter of the school districts did not participate in any health promotion program apart from the federal programs (SBP and NSLP). External health promotion programs funded by government or non-government organizations provide school districts with more opportunities to meet some of the school-age child health priorities while contributing to the implementation of the wellness policy (Hager et al., 2016). School districts without health promotion programs miss out on extra resources to meet competing school wellness priorities, recent or more diversified approaches towards

student health promotion and the opportunity to increase knowledge to the wider community. Further, the CDC (2015) explained in the social ecological model framework that such systems interactions have the potential to influence nutrition and health behavior which most likely would contribute to improved wellness policies quality.

This study also revealed that there was no significant difference in the mean scores for either school wellness policy comprehensiveness or strength by the presence of health promotion programs categorized by type or number, within programs or between programs. Our study findings implied that the presence of school health promotion programs did not significantly influence the quality of school wellness policies of school districts in the State of Oklahoma. The difference between our study findings and Hager et al. (2016) who reported that collaborations with programs other institutions or organizations influenced wellness policies was most likely due to low interaction between school district health council members and health promotion program services. An example of how health promotion programs could influence the quality of SWPs is through capacity building on policy provision requirements in the context of the local school district environment, knowledge of extra resources available through partnerships to implement wellness policy items and sharing on success and failures on SWP implementation locally and nationally. School health council members are selected from the community and given the obligation to draft wellness policies (USDA, 2004) without certainty of their technical competence on school-age child nutrition and health or whether they are up-to-date with the recent policies/ laws in their community (Nollen et al., 2007). This could possibly be improved through closer interaction of health

promotion program services with the community members especially those that are health council members (Pew Charitable Trusts et al., 2014).

Implications for research and practice

This study has important implications for improving school wellness policy quality. This study demonstrated that presence of health promotion programs did not influence the drafting of school wellness policies. The SWP quality in our study does not reflect the fact that many school districts are partnering with multiple health promotion programs that should have improved the quality of their wellness policies. This does not imply that health promotion programs do not provide valuable services but rather that it is important for school districts to continue to work with health promotion programs because they offer expertise and resources that may not be available to a school district otherwise. Our study recognizes that in some cases, these programs may only be operating in a limited number of the district's school sites. Therefore, having a school health council that has broad representation of all the districts' sites as well as stakeholder groups can help inform revision of the SWP policy to be more reflective of the actual programming that is occurring within the district and help promote the program to other school sites. Further, school wellness councils can look to health promotion programs for the expertise needed to write policy language that is both specific and measurable, which will be reflected in higher policy strength scores. On a regular basis, designated officials within the district should conduct environmental scans and revise the policy to assure it is being implemented as written and that it reflects new health promotion strategies and programming taking place in the district. Additionally, school districts should lobby through state agencies and nongovernmental organizations/ institutions to collaborate

with different health promotion programs to boost diversity of expertise on wellness, services and improve opportunities for school-age children and staff as well as the community around school sites.

Future research may consider a mixed methods study (qualitative and quantitative) examining specific influences of health promotion programs services on school-age child health. Further, future research should examine the association between specific health promotion program services and school wellness policy implementation/practices. The research could examine how these programs target specific wellness practices in various school sites of the program implementation. Future research is needed to investigate the determinants of low physical education and physical activity policy section scores in the State of Oklahoma, especially how specific regulations and standard physical activity and exercise in the routine academic curriculum are integrated. Future research on physical education and physical activity section performance among school districts in Oklahoma may explain if, and to what extent, schools allow for student exemptions from physical activity and education courses or is the exemption due to lack of resources, lack of time in the school schedule, too much emphasis on academic requirements or other novel determinants that would be revealed.

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APPENDICES

APPENDIX A: Summarized information on health promotion programs services included in this study

Name of health promotion program	Funding Agency	Implementation area (National/ State)	Key section addressed in WellSAT 2.0	Services provided
TSET-CXPAN Focus: Policy-driven (Tobacco Settlement Endowment Trust, 2017).	TSET Board of Investors (1998 Master Settlement Agreement)	Statewide	1, 3, 4, 5 & 6	• Provide grants to enable local counties to: - – Promote healthy foods and beverages – Improve access to healthy affordable foods and beverages – Raise awareness on prevention of obesity – Promote physical activity and exercise
TSET Incentive grant Focus: direct funding (Tobacco Settlement Endowment Trust, 2017).	TSET Board of Investors (1998 Master Settlement Agreement)	Statewide	1 & 5	• Through grants, supports schools and school districts to implement health promotion policies • Supports school districts to promote healthy meals and tobacco free environment

Certified Healthy School Focus: Policy-driven (Certified Healthy Oklahoma, 2017).	Unfunded mandate for program CDC (administrative funding)	Statewide	1, 2, 3, 4, 5 & 6	• Support and recognize schools that excel in creating healthy environments for their students • Promote healthy food and beverage options in school environments • Offer community nutrition services to children outside the NSLP • Promote adequate school-age child feeding time that is 10 minutes for breakfast and 20 for lunch from the time a child is seated
Certified Healthy Community Focus: Policy-driven (Certified Healthy Oklahoma, 2017).	Unfunded mandate for program CDC (administrative funding)	Statewide	1, 3, 4,5 & 6	• Promoting healthy foods and beverages access in the community, for example fresh fruits and vegetables • Promoting healthy lifestyles through regulation of alcohol and tobacco retail outlets and access to youth. marketing/advertising • Increasing opportunities for nutrition and physical activity promotion in the community • Promoting community access to health

				services • Raising awareness on community health promotion and wellness
Schools for Healthier Lifestyles Focus: Direct nutrition & physical activity programming (Healthy Schools Oklahoma, 2017).	Federal, State and Private donations	Statewide	1, 4 & 6	• Support schools and school districts to participate in physical activity, nutrition promotion and tobacco use prevention • Offer grants to qualifying schools to – acquire equipment for physical activity, nutrition. – engage in active prevention of tobacco use – promote oral health in schools
It's All About Kids Focus: Direct nutrition & physical activity programming (It's All About Kids, 2017).	Tulsa Health Department	Statewide	1, 4, 5 & 6	• Promote nutrition education and physical activity for school-age children • Evaluate student academic performance and behavior following the Whole School, Whole Community model • Promote the Whole School, Whole Community, Whole Child (WSCC) Model
Cooking for Kids	Oklahoma			• Culinary training for School Nutrition Professionals • Support schools to

Focus: Culinary training and direct nutrition services (Cooking for Kids, 2017).	State Department of Education	Statewide	1& 2	effectively utilize their budget to make and service healthy and appealing lunches for school-age children • Support school sites prepare and serve heathy lunches on budget to students
Alliance for a Healthier Generation Focus: Policy driven (Alliance for a Healthier Generation, 2017).	Robert Wood Johnson Foundation	Nationwide	3, 4, 5 & 6	• Policy guidance to school districts on nutrition standards for foods and beverages • Follow up on schools to be compliant on increasing healthy eating and physical activity • Mobilizing parents, staff and students for healthier school environments

1=Nutrition education, 2=standards for USDA Child Nutrition Programs and school meals, 3= Nutrition standards for competitive and other foods and beverages, 4=physical education and physical activity, 5=wellness promotion and marketing and 6=implementation, evaluation and communication

APPENDIX B: Data user agreement between Alliance for a Healthier Generation and Oklahoma State University

DATA USE AGREEMENT BETWEEN
Alliance for a Healthier Generation
AND
Oklahoma State University

This Data Use Agreement ("DUA") is effective on the date of full execution of this DUA between the Alliance for a Healthier Generation, hereafter "Alliance" and Oklahoma State University, hereafter "OK State" and sets forth the terms and conditions pursuant to which the Alliance will disclose certain proprietary program and other Data as defined below to OK STATE on a one-time basis. The Alliance retains ownership or licensed rights in this Data, and OK STATE obtains only such limited, non-transferrable, rights as are explicitly granted in this DUA.

1. **Purpose**
   The purpose of this DUA is to govern the transfer of Data (as defined below) by the Alliance to OK STATE solely for the purpose of conducting research to see any association between schools utilizing Alliance resources have stronger school wellness policies, hereinafter the "Purpose".

2. **Type of Data Shared (hereinafter "Data")**
   a. Alliance proprietary program Data to be provided will include the following:
      i. A list of Oklahoma schools that were registered with the Alliance in the 2014-2015 and 2015-2016 school years.
   b. No personal, individually identifiable data will be shared with Organization.

3. **Permitted Uses and Disclosures**
   a. OK STATE agrees as follows:
   b. OK STATE may make all uses and disclosures of the Data provided solely for the Purpose.
   c. Data may be used for OK STATE's internal purposes only as outlined herein and OK STATE will not disclose this Data in whole or in part to any third party without the direct written consent of the Alliance.
   d. OK STATE will not sell or use the Data for commercial purposes.
   e. Unless agreed otherwise, OK STATE shall provide any proposed press release related to this DUA to the Alliance for review and comment at least ten (10) business days prior to release.
   f. No findings, reports, presentations, or other writings will be released to any third party without editorial review, comment and the removal of any confidential or proprietary information by the Alliance. The Alliance will review and comment within five (5) business days of receiving such findings, reports, presentations or writings. OK STATE shall consider, but is not required to incorporate any suggested edits or comments.

4. **OK STATE Responsibilities**
   a. OK STATE will not use or disclose the Data provided for any purpose other than permitted by this DUA or as required by law.
   b. OK STATE will use appropriate administrative, physical and technical safeguards to prevent use or disclosure of the Data provided.
   c. OK STATE will report to the Alliance any unauthorized use or disclosure of the Data provided of which OK STATE becomes aware within five (5) days of becoming aware of such use or disclosure.
   d. OK STATE will ensure that any agent, including a subcontractor, to whom it provides the Data, agrees to the same restrictions and conditions that apply under this DUA to OK STATE with respect to the Data provided.
   e. OK STATE will not sell or attempt to sell any product or service to the school sites whose data or information may be included in the Data provided.
   f. OK STATE may contact school sites whose information is contained in the Data regarding such data for implementation of the Purpose.

5. **Ownership of Materials**
   a) All underlying marks, creative properties or materials (collectively, "**Pre-existing Materials**") used by the Alliance or OK STATE, which were created and/or developed by either party prior to the date of this DUA and used in connection with this DUA shall not become the property of the other party. Each party represents and warrants to the other that the Pre-existing Materials provided hereunder shall be original and unpublished work, or that it owns all right, title, interest or license in the Pre-existing Materials, including all copyright in the Pre-existing Materials, and that the Pre-existing Materials contain no defamatory or unlawful matter and will in no way infringe the rights of any third party.
   b) Other materials developed in connection with this DUA, if any, by either the Alliance or OK STATE shall be the property of the party creating the materials and such materials may only be used in such form and manner as may be approved in advance and in writing by the owner of such materials. In the event of a dispute regarding the development and ownership of any materials, the parties agree to work together to reach a mutually acceptable agreement regarding the ownership of and right to use such materials.

6. **Confidentiality**
   a. During the course of this Agreement, the parties may make available to each other certain Confidential Information (as hereinafter defined) or one party may otherwise learn of Confidential Information belonging to the other party. For purposes of this Section 9, "Confidential Information" means any and all non-public, confidential or proprietary information regarding a party or its business, including, without limitation, all products, patents, trademarks, copyrights, trade secrets, processes, techniques,

scientific information, computer programs, databases, software, services, research, development, inventions, financial, purchasing, accounting, marketing, and other information, whenever conceived, originated, discovered or developed, concerning any aspect of its business, whether or not in written or tangible form; provided, however, that the term "Confidential Information" shall not include information (i) which is or becomes generally available to the public on a non-confidential basis, including from a third party provided that such third party is not in breach of an obligation of confidentiality with respect to such information, (ii) which was independently developed by a party not otherwise in violation or breach of this Agreement or any other obligation of one party to the other, or (iii) which was rightfully known to a party prior to entering into this Agreement.

b. Except as otherwise provided herein: (i) the parties shall hold in strictest confidence any of the other party's Confidential Information; (ii) the parties shall restrict access to the Confidential Information to those of their personnel with a need to know and engaged in a permitted use of the Confidential Information; (iii) the parties shall not distribute, disclose or convey Confidential Information to any third party; (iv) the parties shall not copy or reproduce any Confidential Information except as reasonably necessary to perform any obligations hereunder; and (v) the parties shall not make use of any Confidential Information for its own benefit or for the benefit of any third party. The foregoing to the contrary notwithstanding, the parties shall not be in violation of this subsection in the event that a party is legally compelled to disclose any of the Confidential Information, provided that in any such event the disclosing party will provide the other party with reasonably prompt written notice prior to any such disclosure so that the non-disclosing party may obtain a protective order or other confidential treatment for the Confidential Information, and in the event that a protective order or other remedy is not obtained by the non-disclosing party, the disclosing party will furnish only that portion of the Confidential Information which is legally required to be furnished.

7. **Term and Termination**
   a. The term of this DUA shall be effective on the date of full execution of this DUA, and shall remain in effect until October 1, 2018 (the "Term"), unless terminated sooner as provided below. OK STATE may retain one (1) copy of the Alliance's Confidential Information in a secure location for archival purposes.
   b. Should OK STATE desire to use the Data for a longer period, a request in writing must be made to the Alliance for its consideration. If the parties agree to extend the Term of this DUA, the extended Term shall be set out in a written amendment to this DUA.
   c. Either party may terminate this DUA at any time by providing thirty (30) days prior written notice to the other party.
   d. Alliance may terminate this DUA upon five (5) days prior written notice to OK STATE if OK STATE breaches any provision of this DUA and such breach is not cured within such five (5) day period.

e. If DUA is terminated due to an uncured breach, OK STATE shall cease all work in progress, provide the Alliance with any work product that resulted from the Data provided.
f. Upon termination of this DUA for any reason, OK STATE will destroy or, if requested, return the Data and Confidential Information to the Alliance in an agreed upon format.

8. **General Provisions**
   a. This DUA shall not be assigned by OK STATE without the prior written consent of the Alliance.
   b. The Data provided is not intended to be used for an overall evaluation of the Alliance's Healthy Schools and Communities Program.
   c. Indemnification. OK STATE represents that it has statutorily prescribed liability insurance coverage for the negligent acts of its officers, employees, and agents while acting within the scope of their employment by OK STATE, and OK STATE has no liability insurance policy as such that can extend protection to any other person including (name of Company). Subject to the provisions of the Oklahoma Governmental Tort Claims Act, (Title 51 O.S., Sec. 151, et seq.) including its limits of liability and exclusions therefrom, University assumes those risks of personal injury and property damage attributable to the negligent acts or omissions of the OK STATE, its officers, employees and agents.
   d. Each party agrees to comply with all applicable federal, state and local laws regarding the disclosure and use of the Data.
   e. This DUA shall be governed by the substantive laws of the State of Oklahoma, which shall prevail in the event of any conflict of law.

Any questions related to data sharing and this DUA should be made to the respective contacts listed below. The parties mutually agree that the following named individuals will be designated as points-of-contact for the DUA on behalf of each party.

Andrea Gawlista, Data Manager
(503) 467-9157
andrea.gawlista@healthiergeneration.org

Deana Hildebrand, Associate Professor, Nutritional Sciences, Oklahoma State University
405-744-5059
deana.hildebrand@okstate.edu

[Signatures appear on the following page]

Data Use Agreement

I hereby acknowledge that I have read, understand, agree and will comply with terms of this DUA. I have also received an overview and technical assistance on data definitions, data fields, and reports provided by the Alliance.

By signing this document, I agree to comply with the above provisions.

OKLAHOMA STATE UNIVERSITY

Signature: _____

Printed Name: ___Kenneth W. Sewell_____

Title: __Vice President for Research_____

Date: 9/12/17

Email: ___research@okstate.edu_____

Phone: __(405) 744-6501_____

ALLIANCE FOR A HEALTHIER GENERATION

Signature: _____

Printed Name: Howell Wechsler

Title: CEO

Date: 09/11/2017

APPENDIX C: Oklahoma State University Institutional Review Board assessment for the study

Fri 7/7/2017 7:23 AM

IRB

IRB Application Determined to be Not Human Subjects Research

To Hildebrand, Deana

Cc Komakech, Joeljoshua; Erwin, Christi; Humphrey, Jeremy

IRB Application No: HS-17-44

Proposal Title: Assessment of the School Wellness Policies in Oklahoma State School Districts

Reviewed and Processed as: NHSR

Application Status: Closed

Based on the information provided in this application, the OSU-Stillwater IRB has determined that your project does not qualify as human subject research as defined in 45 CFR 46.102 (d) and (f) and is not subject to oversight by the OSU IRB. Should you have any questions or concerns, please do not hesitate to contact the IRB office at 405-744-3377 or irb@okstate.edu.

Cordially,

Dawnett Watkins, CIP

IRB Manager

VITA

Joel Joshua Komakech

Candidate for the Degree of

Master of Science

Thesis: SCHOOL WELLNESS POLICY QUALITY MAY NOT REFLECT THE PRESENCE OF HEALTH PROMOTION PROGRAMS

Major Field: Nutritional Sciences

Biographical:

Education:

Completed the requirements for the Master of Science in Nutritional Sciences at Oklahoma State University, Stillwater, Oklahoma in December, 2018.

Completed the requirements for the Master of Science in Public Health at International Health Sciences University, Kampala, Uganda in 2014.

Completed the requirements for the Bachelor of Science in Human Nutrition & Dietetics at Kyambogo University, Kampala, Uganda in 2010.

Experience:

Graduate Teaching Assistant 2017 – 2018
Program Manager (Community Management of Acute Malnutrition program), Action Against Hunger USA, Uganda Mission 2016 – 2017
Program Manager, The Hunger Project Uganda 2010 - 2016

Professional Memberships:

Society for Nutrition Education and Behavior: Student Member 2018 – to date