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Courtney Trapp  
*South Dakota State University*

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ASSESSING THE RELATIONSHIP BETWEEN PRINCIPAL PRIORITIES,  
WRITTEN WELLNESS POLICIES, AND SCHOOL WELLNESS POLICY  
IMPLEMENTATION

BY

COURTNEY TRAPP

A thesis submitted in partial fulfillment of the requirements for the

Master of Science

Major in Nutrition and Exercise Science

Specialization in Exercise Science

South Dakota State University

2020

## THESIS ACCEPTANCE PAGE

Courtney Trapp

This thesis is approved as a creditable and independent investigation by a candidate for the master's degree and is acceptable for meeting the thesis requirements for this degree.

Acceptance of this does not imply that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Jessica Meendering

Advisor

Date

Kendra Kattelmann

Department Head

Date

Dean, Graduate School

Date

## DEDICATION

I dedicate this project to Maggie Kringen, for her continuous support and uplifting encouragement throughout the last two years. We have grown so much together, and I am so grateful for our friendship.

I dedicate this project to Scott, Carla, and Rebeca Trapp for their love, continuous support, kindness, and endless phone conversations. Thank you for celebrating in my successes and encouraging me through setbacks.

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## TABLE OF CONTENTS

<b>ABSTRACT</b> .....	<b>V</b>
<b>CHAPTER 1: LITURATURE REVIEW</b> .....	<b>1</b>
TABLE 1: CHILDHOOD OBESITY .....	1
TABLE 2: SCHOOL WELLNESS POLICIES AND LEGISLATION.....	2
TABLE 3: SCHOOL WELLNESS POLICY QUALITY AND IMPLEMENTATION .....	3
TABLE 4. SCHOOL LEADERSHIP .....	8
TABLE 5: WELLNESS POLICY ASSESSMENT TOOLS.....	13
<b>CHAPTER 2: MANUSCRIPT</b> .....	<b>16</b>
INTRODUCTION .....	16
METHODS .....	18
<i>School Recruitment</i> .....	18
<i>Assessments</i> .....	18
DATA ANALYSIS.....	21
RESULTS .....	21
DISCUSSION.....	22
CONCLUSION.....	27
<b>TABLES</b> .....	<b>28</b>
TABLE 1. MATCHED QUESTIONS FROM THE WELLSAT AND WELLSAT-I.....	28
TABLE 2. PRINCIPAL PRIORITIES .....	33
TABLE 3. WELLSAT 2.0 .....	34
TABLE 4. WELLSAT-I .....	35
TABLE 5. CORRELATION R VALUES.....	36
<b>REFERENCES</b> .....	<b>37</b>

## ABSTRACT

ASSESSING THE RELATIONSHIP BETWEEN PRINCIPAL PRIORITIES,  
WRITTEN WELLNESS POLICIES, AND SCHOOL WELLNESS POLICY  
IMPLEMENTATION

COURTNEY TRAPP

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**Purpose:** The purpose of this study is to assess the relationship between principal priorities, written wellness policies, and school wellness policy implementation.

**Methods:** Principal priorities of nutrition and physical activity, written wellness policy quality and degree of policy implementation were assessed in 95 schools from eight states using the principal priorities questionnaire, the Wellness School Assessment Tool (WellSAT) version 2.0, and the Wellness School Assessment Tool for Implementation (WellSAT-I), respectively. Data is analyzed using Stata Statistical Software: Release 15. All data is presented as means  $\pm$  standard error. Statistical significance was set at  $p \leq 0.05$ .

**Results:** There was not a significant relationship between principal priorities on nutrition and WellSAT 2.0 sections using both comprehensiveness and strength scores. Similarly, no significant relationships were found between total scope and total mastery scores from the WellSAT-I and principal priorities on nutrition. Total strength score and total comprehensiveness score from the WellSAT 2.0 showed no association to principal priorities on physical activity and physical education. Likewise, no association was found between total scope and total mastery score from the WellSAT-I and principal priorities on physical activity and physical education.

**Discussion:** The present study yielded different results than previous literature potentially because this study looked at principal priorities specifically, whereas the previous literature focused on the individual dedicated to improving wellness within the school, whether they were the principal or not. The lack of strict regulations on creating and implementing a wellness policy can cause a communication disconnect between the district and the school. Together with our data, this shows that although the principal is the school leader, their priorities of Nutrition and PA are not fundamental to wellness efforts.

## Chapter 1: LITURATURE REVIEW

**TITLE:** Assessing the relationship between principal priorities, written wellness policies, and school wellness policy implementation

**PURPOSE:** The purpose of this study is to assess the relationship between principal priorities, written school wellness policies, and school wellness policy implementation.

**Table 1: Childhood Obesity**

Author, Year, & Study Title	Sample Size & Characteristics	Study Purpose	Methods	Major Findings
<b>Foster et al. 2007 A Policy-Based School Intervention to Prevent Overweight and Obesity</b>	n=1349 students in grades four through six from 10 schools in the Mid-Atlantic region in the US.	Examine the effects of a school Policy Initiative on the prevention of overweight and obesity	Students were assessed at baseline and again at 2 years. Information recorded included; BMI, dietary intake, physical activity, and sedentary behavior	A multi component school-based intervention can be effective in preventing the development of overweight children.
<b>Hofferth et al. 2000 How American Children Spend Their Time</b>	Over 3,500 American children ages 9-12	Assess how American Children are spending their time	Children and parents were asked to keep a time diary to log all activities, including school, sleep and activities	Children ages nine and older are spending a significant percentage of time in school

### KEY

NHANES: National Health and Nutrition Examination survey

US: United States

BMI: Body Mass Index

## REFERENCES

1. Foster GD, Sherman S, Borradaile KE, et al. A policy-based school intervention to prevent overweight and obesity. *Pediatrics*. 2008;121(4). doi:10.1542/peds.2007-1365
2. L. Hofferth S, F. Sandberg J. How American Children Spend Their Time. *J Marriage Fam*. 2001;63(2):295-308.

**Table 2: School Wellness Policies and Legislation**

<b>Public Law Name, Number and Issue Date</b>	<b>Purpose</b>	<b>Act of Congress</b>	<b>Requirements</b>
<p>US Congress. <b>Public Law 108-265.</b> <b>Child Nutrition Reauthorization Act of 2004</b>  2004</p>	<p>Increase nutrition and physical activity standards in school environments to improve upon child health and safety.</p>	<p>Mandatory SWP development for all schools participating in the NSLP, by the start of the 2006-2007 school year.</p>	<p>Schools required to create a community wide represented wellness committee to write SWP. SWP must address nutrition education, physical education, nutrition standards, NSLP compliance, and plans for SWP implementation and evaluation.</p>
<p>US Congress <b>Public Law 111-296. Healthy Hunger Free Kids Act of 2010</b>  2010</p>	<p>To further develop requirements set by the Child Nutrition and WIC Reauthorization Act of 2004 to prevent childhood obesity.</p>	<p>Highlight SWP implementation and make SWP evaluations publicly accessible</p>	<p>Require wellness committees to include community members, school health professionals, school food staff, school board members, school administrators, students and parents. School wellness councils must continuously evaluate their SWP and make updates as needed available to the public.</p>



<b>US Congress</b>	Establishing minimum SWP content requirements, ensuring mandatory participation and compliance with current regulations.	Mandatory update of SWP for all schools participating in the NSLP, by the start of the 2016-2017 school year.	Local government agency must increase SWP transparency by evaluating updated written SWP and SWP implementation every three years.
<b>Final Rule of 2016. Public Law: 210-235 Issued July 2016</b>			
<b>2016</b>			

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**KEY**

NHANES: National Health and Nutrition Examination survey

US: United States

SWP: School Wellness Policy

NSLP: National School Lunch Program

**REFERENCES**

3. United States Department of Agriculture Food and Nutrition Service. Child Nutrition and Women Infants and Children (WIC) Reauthorization Act of 2004. 2004:Sec. 204 Public Law 108-205.
4. United States Department of Agriculture Food and Nutrition Service. Healthy, Hunger-Free Kids Act of 2010. 2010:Public Law 108-205.
5. United States Department of Agriculture Food and Nutrition Service. Final Rule: Local School Wellness Policy Implementation Under Healthy, Hunger-Free Kids Act of 2010. 2016;81(146).

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**TABLE 3: School Wellness Policy Quality and Implementation**

Author, Year and Study Title	Sample Size	Sample Characteristics and Study Purpose	Methods	Major Findings
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<p><b>Chriqui et al.</b> <b>2001</b> <b>School District Wellness Policies: Evaluating Progress and Potential for Improving Children's Health Eight Years After the Federal Mandate</b></p>	<p>n=2900 individuals</p>	<p>Learn more about school nutrition and physical activity environment and what school boards and districts need to move forward with developing, implementing, and evaluating their SWP. The sample size included school board members, state school board leaders, school wellness advocates, and state public nutrition directors.</p>	<p>Survey's and focus groups with target audience and interviews with key informants (superintendents, school district stakeholders and state well policy collaborators)</p>	<p>Among all target audience there was a belief that SWP will positively impact their district. Having adequate tools to support those who are responsible for policy development was ranked as the 4th major barrier</p>
<p><b>Smith et al.</b> <b>2012</b> <b>School Wellness Policies: Effects of Using Standard Templates</b></p>	<p>N=130 Virginia school district wellness policies</p>	<p>Determine the degree to which third-party school wellness policy templates either improve or reduce policy quality.</p>	<p>10 wellness policies were randomly selected from two classifications 1) locally developed policy 2) policy influenced by or provided by Virginia Schools Boards Association. Researchers used the WellSAT to determine strength and comprehensiveness of those 20 policies to see if there were associations between the two groups.</p>	<p>Locally developed school wellness policies were stronger and more comprehensive than those influenced by or provided by the Virginia School Boards Association.</p>

<p><b>Cox et al.</b></p> <p><b>2016</b></p> <p><b>Strength and comprehensiveness of school wellness policies in southeastern US school districts</b></p>	<p>N=111 school districts</p>	<p>Sample frame was from 8 US states focusing on grades 6-8.</p> <p>To examine the extent to which SWPs have been adopted in the southeastern states and the comprehensiveness and strength of the policies, both overall and with regard to specific wellness domains.</p>	<p>All school wellness policies were coded using a tool developed by the Robert Wood Johnson Healthy Eating Research Group to assess the potential impact of SWPs</p>	<p>Little variation was found in SWP comprehensiveness and strength with regard to district demographics. The only significant result was that as a district's size increased, the comprehensiveness of its SWPs decreased. Meaning the focus could be directed to larger districts first.</p>
<p><b>Martin et al.</b></p> <p><b>2019</b></p> <p><b>Association between Written School Nutrition Wellness Policies and the Observed Nutrition Environment within the Elementary Schools</b></p>	<p>N = 26 schools within a Midwest state.</p>	<p>Examine the association between quality of wellness policies and the observed nutrition environment.</p>	<p>Wellness policies were evaluated using the WellSAT 2.0. The nutrition environment was assessed using the SPAN-ET.</p>	<p>WellSAT strength scores were positively associated with the observed garden features and WellSAT NE section comprehensiveness scores were negatively associated with scores with the observed school meals. Mean wellness policy nutrition section scores did not differ across the observed school nutrition environment.</p>

<p><b>Francis et al.</b> <b>2018</b></p> <p><b>Quality of local school wellness policies for physical activity and resultant implementation in Pennsylvania schools.</b></p>	<p>Seven school districts (with elementary, middle and high school buildings)</p>	<p>High obesity rates (24-43.6% of obesity) Pennsylvania schools The purpose of this study is to describe the physical activity policy and implementation of schools in Pennsylvania with high obesity rates.</p>	<p>Wellness policies were evaluated using the WellSAT and physical activity implementation was evaluated using HSP</p>	<p>School have generally weak school wellness policies which limits their ability to influence school-based activities</p>
<p><b>Hoffman et al.</b> <b>2016</b></p> <p><b>School district wellness policy quality and weight-related outcomes among high school students in Minnesota</b></p>	<p>N=270 Minnesota School Districts</p>	<p>Minnesota Public High Schools</p> <p>To examine the wellness policy environments in Minnesota public school districts, providing an analysis of the quality of existing policies and their association with district-level measures of high school student weight-related outcomes.</p>	<p>The WellSAT was used to assess strength and comprehensiveness of written policies, the MSS (Minnesota Student Survey) was used to assess a variety of health risks, and the National Center for Educational Statistics was used for BMI data.</p>	<p>Having community members united in the fight against childhood obesity seems to be a key element in getting childhood obesity prevention legislative policies the momentum they need to gain acceptance and action at a state level.</p>

<b>Hager et al.</b>  <b>2015</b>  <b>Implementation of Local Wellness Policies in Schools: Role of School Systems, School Health Councils, and Health Disparities</b>	N=1349 schools	Public schools with exclusion criteria (part-time, alternative, exclusively prekindergarten, exclusively special education. The purpose of this study is to assess school perceived support system and school health committees and the effect on school wellness policy implementation.	Online surveys were administered to each school and state provided school demographic.	Schools with perceived support systems had a greater likelihood of local wellness policy implementation. School health committee support may overcome local wellness policy implementation obstacles related to disparities.
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#### KEY

WellSAT = Wellness School Assessment Tool

HSP = Alliance for Healthier Generation's Healthy School Program

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**TABLE 4. School Leadership**

Author, Year and Study Title	Sample Size	Sample Characteristics and Study Purpose	Methods	Major Findings
<b>Westrich et al.</b> <b>2015</b> <b>Coordinated School Health and the Contribution of a District Wellness</b>	N=8 schools	To provide practical information about the role such a district-level wellness coordinator can play in program delivery	Interviews with school staff and focus groups with parents, students, and volunteers were conducted. Semi-structured protocols were used to find out individual background, knowledge, and perceptions of school wellness initiatives within the school.	Where wellness coordinators identified school needs and provided resources, collaborated with informal wellness champions, and acted in leadership roles there was increased: (1) awareness of health and wellness, (2) integration of wellness activities within and across schools and districts, and (3) leveraging of resources to support wellness programs and activities for students.
<b>Moag-Stahlberg et al.</b> <b>2008</b> <b>A National Snapshot of Local School Wellness Policies</b>	N=63 school districts and 256 policies	The sample included districts with small, medium, and large student enrollment from every state (except Hawaii)  To assess district policy goals and compare them to the federal mandate and benchmarks of best practices	Policies were compared to federal requirements and the AFHK Wellness Policy Fundamentals, a tool which documents best practices for nutrition and physical activity in schools.	These findings provide direction to school health educators, school nurses, administrators, and other stakeholders assisting schools with efforts to improve nutrition and physical activity

<p><b>Lucarelli et al.</b></p> <p><b>2015</b></p> <p><b>Little Association Between Wellness Policies and School- Reported Nutrition Practices</b></p>	<p>N= 65 schools</p>	<p>Michigan middle schools with 50% or more of students eligible for free or reduced-price meals.</p> <p>To describe the quality of school district wellness policies, to examine differences in wellness policy quality, and to determine whether district-level written wellness policies reflect school-reported nutrition policies and practices.</p>	<p>Written wellness policy quality was assessed using the School Wellness Policy Evaluation Tool. School nutrition policies and practices were assessed using the School Environment and Policy Survey</p>	<p>Encouraging policy template customization and stronger, more specific language may enhance wellness policy quality, ensure consistency between policy and practice, and enhance implementation of school nutrition initiatives</p>
<p><b>Agron et al.</b></p> <p><b>2010</b></p> <p><b>School Wellness Policies: Perception, Barriers, and Needs Among School Leaders and Wellness Advocates</b></p>	<p>N=2350 respondents</p>	<p>Balanced mix of urban/suburban/rural districts and reflect socio-economic and racial/ethnic diversity</p>	<p>Surveys, focus groups, and interviews with superintendents, school district stakeholders, and a state-level collaboration. Four related, but separate online survey ranging from 16-25 questions, mostly closed ended with 3-5 options. Discussion and interviews were also used.</p>	<p>Long term, top-level commitment to student health and wellness from the administrators is important to implementation. A wellness coordinator or another dedicated person to guide wellness initiatives aids in the implementation process.</p>

<p><b>Profili et al.</b></p> <p><b>2017</b></p> <p><b>School wellness team best practices to promote wellness policy implementation</b></p>	<p>N=311 schools</p>	<p>Maryland public schools.</p> <p>To determine associations among schools with wellness teams, and LWP implementation.</p>	<p>An online survey targeting Maryland school wellness leaders/administrators was administered that included LWP implementation (17-item scale: categorized as no, low, and high implementation) and six wellness team best practices. Six questions determined composition/activities of wellness.</p>	<p>Wellness teams meeting best practices are more likely to implement LWPs. Interventions should focus on the formation of wellness teams with recommended composition/activities. Study findings provide support for wellness team recommendations stemming from the 2016 Healthy, Hunger-Free Kids Act final rule.</p>
<p><b>Schwartz et al.</b></p> <p><b>2012</b></p> <p><b>Strength and comprehensiveness of district school wellness policies predict policy implementation at the school level.</b></p>	<p>n=151 school districts</p>	<p>Predict SWP implementation based off of SWP strength and comprehension scores. Connecticut sample of public-school districts participating in the NSLP that voluntarily submitted their current SWP</p>	<p>teams based on best practices Collection of districts SWP, assessed with the WellSAT 1.0 tool, School Nutrition and Physical Activity Practices survey to principals regarding school practices, and district demographics obtained through public data sources.</p>	<p>SWP that contain stronger and more comprehensive language had greater success of full policy implementation throughout the school.</p>
<p><b>Hager et al.</b></p> <p><b>2018</b></p> <p><b>Pilot Testing and Intervention to Enhance Wellness Policy Implementation in Schools: Wellness Champions for Change</b></p>	<p>63 elementary middle and high schools</p>	<p>5 Maryland School districts, to develop and pilot test Wellness Champions for Change to enhance local wellness policy implementation by forming wellness teams.</p>	<p>Baseline assessments (online surveys assessing school-level implementation of wellness policies and practices, and wellness team composition) were taken and schools were randomized into one of three groups (WCC training plus TA, WCC training, or delayed control.</p>	<p>The WCC intervention indirectly affected LWP implementation through the formation of active wellness teams.</p>



<p><b>Budd et al.</b></p> <p><b>2009</b></p> <p><b>Published Factors Influencing the Implementation of School Wellness Policies in the United States</b></p>	<p>n=112 school administrators</p>	<p>Characterize school wellness policy environment and identify factors influencing the quality of effective policy implementation. High schools that participated in BALANCE were selected.</p>	<p>Individuals in charge of ensuring that schools fulfilled the districts school wellness policy were given a 27 item SWP Implementation Questionnaire, a tool developed to assess variables influencing SWP implementation</p>	<p>Schools reporting a higher SWP quality and effectiveness were more likely to have developed organization capacity to implement a SWP and also reported few challenges to implementation that schools reporting lower SWP quality</p>
<p><b>Hager et al.</b></p> <p><b>2018</b></p> <p><b>“Wellness Champions for Change,” a multi-level intervention to improve school level implementation of local wellness policies.</b></p>	<p>30 schools</p>	<p>5 Maryland school districts (15 elementary and 15 middle) that are low- or middle-income schools. The purpose of this study is to determine the impact of WCC on student health behaviors, examine outside factors and how they affect the impact of WCC, and assess impact of participating wellness teams on school leaders.</p>	<p>Schools will be randomized to one of 3 groups to see if implementation of WCC program has an effect on schools.</p>	<p>Wellness teams, led by wellness champion, could have the potential to enhance school level implementation.</p>

<p><b>O'Brien et al.</b></p> <p><b>2010</b></p> <p><b>Impact of a school health coordinator intervention on health-related school policies and student behavior</b></p>	<p>N= 80,428 students<sup>b</sup></p>	<p>328 schools across the state of Maine. The purpose of this study is to evaluate the impact of the Healthy Maine Partnerships SHC (HMPSHC) intervention on school policies and student risk behaviors.</p>	<p>Cross-sectional analyses were performed on 2006 data to assess physical activity, nutrition, and tobacco-related policy associations with the HMPSHC intervention. Policy and student behavior analyses were conducted to assess associations.</p>	<p>In schools with a school health coordinator, there is a stronger association between improved school health programs and a decrease in risk behavior.</p>
<p><b>McIlree et al.</b></p> <p><b>2018</b></p> <p><b>Wellness Committee Status and Local Wellness Policy Implementation Over Time</b></p>	<p>N= 1,333 schools</p>	<p>Maryland public schools in all school districts with exclusions (part-time, alternative, exclusively kindergarten or special education). The purpose of this study is to examine the impact of wellness committee status on LWP implementation.</p>	<p>Online survey was distributed in two rounds and asked respondent to reflect on previous school year. A 17-item survey was used and assessed with a 4-item Likert scale. Topics of questions pertained to local wellness policies and their implementation.</p>	<p>Forming wellness committees encourages local wellness policy implementation.</p>

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KEY

WCC: Wellness Champions for Change

TA: Training Assistance

LWP: Local Wellness Policy

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**TABLE 5: Wellness Policy Assessment Tools**

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Tool Name, Year of Development	Tool Version	Tool Purpose	Target Goal Areas	Scoring System
<b>Updated Wellness School Assessment Tool (WellSAT 2.0)</b>	Updated tool reflecting the current best practice in all areas of SWP. (USDA meal standards: 2012 and 2013, Competitive food standards: 2014). Updated food marketing, physical education and physical activity content areas. Improved compliance standards (SWP monitoring and evaluation).	Standardized method to collect and evaluate consistent and reliable SWP scores assessing quantitative values for SWP strength and comprehension	6 Sections: NE (n=7), SM (n=14), NS (n=11), PEPA (n=20), WPM (n=15), IEC (n=11)	0= The item is not mentioned 1= Item mentioned with confusing or weak wording 2= Item meets or exceeds expectations
<b>Wellness School Assessment Tool – Implementation 2.0</b>	This school wellness policy implementation tool (WellSAT-i) 2.0 measures the degree to which the 78 policy items from the Wellness School Assessment Tool (WellSAT) 2.0 are implemented.	Standardized methods to evaluate school wellness policy implementation assessing quantitative values for SWP implementation with a strength, mastery and total score.	6 Sections: NE (n=7), SM (n=14), NS (n=11), PEPA (n=20), WPM (n=15), IEC (n=11)	0= Has not been implemented 1= partial implementation 2= fully implemented

<b>Principal Priorities Questionnaire</b>	This questionnaire assesses how principals rate their priorities on nine different topic areas.	Evaluate principal priorities through quantitative values from 1-7.	9 topic areas. Budget/Finances, Curriculum & Instruction, Mental Health, Physical Activity/ Physical Education, Professional Development, School Climate/School Culture, School Nutrition, School Safety/Violence, Student Performance/Scores on Standardized Tests	1-7 Likert scale, 1=most important 7= least important
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#### KEY

WellSAT = Wellness School Assessment Tool

WellSAT-I = Wellness School Assessment Tool – Implementation

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22. Principal Priorities Questionnaire

## Chapter 2: Manuscript

### INTRODUCTION

Children ages 6-12 spend approximately 32 hours per week in school, eat one to two meals per day and have multiple opportunities to engage in physical activity,<sup>1</sup> making schools a logical and convenient environment to encourage positive nutrition and physical activity behaviors.<sup>2</sup> In an effort to create healthy school environments, the federal government required all local educational agencies (i.e. school districts) that participate in federally funded meal programs to establish a wellness policy that outlines physical activity and nutrition standards by the start of the 2006-2007 school year.<sup>3</sup> Provisions were added in 2010 regarding policy implementation and evaluation requirements<sup>4</sup> and in 2016, regarding leadership, public participation and public reporting of implementation.<sup>5</sup>

From the year 2006 to 2014 the quality of written wellness policies has increased, but there is still ample room for improvement.<sup>6</sup> During the 2013-2014 school year the comprehensiveness of policy components and the strength of policy language scored 44 and 25 out of 100, respectively, in a national sample of wellness policies.<sup>6</sup> Furthermore, a sample of district policies from one state showed a small percentage (17%) of policies that met all federal requirements.<sup>7</sup> Implementation of wellness policies has been studied less than the written strength and comprehensive of policies, but arguably the implementation is the most impactful because it takes the written policy and puts the concepts into action. Implementation measures across multiple studies appeared to be low when scored as well as highly variable. Together this previous literature suggests there is

ample room to improve the quality of school wellness policies and the degree to which they are implemented.

Leadership has been shown to impact wellness policy implementation.<sup>15,16,18</sup> District level support and perceived district support from school administration have improved wellness policy implementation through planning and initiating tasks and goals.<sup>18</sup> The presence of a school wellness council or committee has also shown improvement in the level of implementation of a school wellness policy.<sup>16,18</sup> Lastly, leadership in the form of long-term administrator commitment, and a motivated individual to guide wellness initiatives have been identified as factors that contribute to successful school wellness policy implementation.<sup>15</sup>

School districts are required to identify leadership as one or more district or school official who has the authority and responsibility to ensure schools are complying with their written policy.<sup>5</sup> Budd et al recently reported that school administrators cited “lack of priority” as a common barrier to school wellness policy implementation, only behind lack of time/coordination of policy team and financial resources.<sup>19</sup> Due to their leadership role, it is logical to hypothesize that principal support of wellness is critical to creating a strong culture of wellness within a school. Little is known about how principals view nutrition and physical activity in terms of priority and how their priorities may impact wellness at the district and school level. Therefore, the purpose of this study is to assess principal priorities and determine if principal priorities of nutrition and physical activity impact the quality of district wellness policies and the degree of policy implementation within schools.

## METHODS

### School Recruitment

During the 2017-2018 school year, one hundred and ten schools were recruited to participate in order to analyze school wellness efforts. A total of 95 schools volunteered to participate reflecting a national sample of data. South Dakota State University collaborated with the Department of Education as well as the UConn Rudd Center to communicate with elementary schools via email. Emails were sent with a description of the study and an electronic link to verify participation. The survey link prompted schools to enter staff contact information as well as a current copy of the school's written wellness policy. Once the survey was completed, school staff was contacted to further discuss study details. Researchers visiting the school, evaluated the quality of the written school wellness policies as well as the degree of school wellness policy implementation within each school. The study was approved by the South Dakota State University Institutional Review Board and deemed exempt as it was not classified as human subject research.

### School Demographics

Data reflecting school demographics were collected from the department of Education in the 2017-2018 academic year. Demographic variables included number of schools within each district, student enrollment, and percentage of student population that participated in the free and reduced lunch program.

### Assessments

The quality of written school wellness policies was assessed using the Wellness School Assessment Tool (WellSAT) 2.0.<sup>20</sup> This tool uses a 0-100 scale system to evaluate the comprehensiveness and strength of written wellness policies. These scores



determined written policy quality. The WellSAT is completed using an online scoring system to assess policy strength, language used to address mandated components, and policy comprehensiveness, the extent to which recommended content areas are covered. The written wellness policies were assessed by two trained staff members prior to the onsite visit of the school. This tool contains six sections, Nutrition Education, Standards for United States Department of Agriculture (USDA) School Meals, Nutrition Standards for Competitive and Other Foods and Beverages, Physical Education and Activity, Wellness Promotion and Marketing, and Implementation/Evaluation/Communication. There are 78 items assess across the 6 sections of the WellSAT, and each item is score on a scale of 0-2. It is scored as 0= not mentioned, 1=weak statement, 2 = meets/exceeds expectations. Each section has a total comprehensiveness score and strength score. The overall policy also has a total strength and comprehensiveness score. The total comprehensiveness score for a section is calculated by summing the number of items scored as a “1 or 2” then dividing by the total number of items per section and then multiplying by 100. The total strength score for a section is calculated by summing the number of items scored as a “2” then dividing by the total number of items per section then multiplying by 100. Total comprehensiveness and strength is scored in a similar fashion except that when dividing, the value would be the sum of all the items on the WellSAT.<sup>20</sup>

School wellness policy implementation was assessed using the Wellness School Assessment Tool – Implementation (WellSAT-I).<sup>21</sup> This tool measures the degree of policy implementation through school site observation and interview of school faculty and staff (principal, health teacher, physical education teacher, cafeteria manager, food

service director, and information technology specialist). The WellSAT-I measures scope, items that are implemented to any degree, and mastery, items that are implemented fully. This tool uses a 0-100 scale system to measure the degree of implementation of the written wellness policy. Each policy item is scored on a zero to three scale, 0 = has not been implemented, 1 = low partial implementation, 2 = high partial implementation, and 3 = fully implemented. Each section has a total scope score and mastery score. The overall policy also has a total scope score and mastery score. The total scope score for a section is calculated by summing the number of items scored as a “1, 2 or 3” then dividing by the total number of items per section and then multiplying by 100. The total strength score for a section is calculated by summing the number of items scored as a “3” then dividing by the total number of items per section then multiplying by 100. Total scope and mastery are scored in a similar fashion except that when dividing, the value would be the sum of all the items on the WellSAT-I.<sup>21</sup>

For this study, 56 items were matched from the WellSAT 2.0 to 56 items from the WellSAT-I that were similarly worded. This allowed for a better comparison between the WellSAT data and the WellSAT-I data. After items were matched, the sections from the WellSAT 2.0 were kept in order to organize the data. A table of the matched items between the WellSAT 2.0 and the WellSAT-I can be found in table 1. The results of this tool help assess to which degree each school wellness policy item is being implemented. Principal perceived priorities were assessed using a principal questionnaire.<sup>22</sup> Principals were asked to rate their priorities using a seven-point Likert scale, one indicating the most important and seven indicating the least important. The questionnaire includes nine items: budget/finance, curriculum & instruction, mental health, physical activity/physical

education, professional development, school climate/school culture, school nutrition, school safety/violence, and student performances/scores on standardized tests.<sup>22</sup>

## DATA ANALYSIS

Data is analyzed using Stata Statistical Software: Release 15. All data is presented as means  $\pm$  standard error. Statistical significance is set at  $p \leq 0.05$ . Descriptive statistics are used to present principal priority areas, written policy quality, and policy implementation for the sample. Linear regression is used to determine if a relationship exists between principal priorities of nutrition and physical activity (Likert scale score; 1-7) and written policy quality (WellsAT strength score and WellsAT comprehensiveness score; 1-100). Linear regression is used to determine if a relationship exists between principal priorities of nutrition and physical activity (Likert scale score; 1-7) and policy implementation (WellsAT-I score; 1-100).

## RESULTS

The final sample included 95 schools within 40 districts, across 8 states. Two-thirds of the schools were elementary schools, and schools varied in size from 40 to 1916 students with a mean enrollment of 490 students. Approximately half of all students were non-white and over 60% received free or reduced lunch. Descriptive data from the principal priorities questionnaire can be found in table 2. Out of the nine principal priorities nutrition and physical activity were rated as least important by principals. The two most important categories according to the principals were curriculum and instruction and school safety/school violence, respectively. Descriptive data from the WellsAT 2.0 is provided in table 3. The overall comprehensive and strength scores for the WellsAT 2.0 were 55.45  $\pm$  1.91 and 34.81  $\pm$  1.72. In comprehensiveness, the nutrition

standards section scored highest. The nutrition standards section scored highest among the sections of the WellSAT 2.0 in strength. Descriptive data for the WellSAT-I is provided in table 4. The overall scope and mastery scores for the WellSAT-I were 76.80 +/- 0.85 and 50.43 +/- 1.02. For scope and mastery, standards for USDA school meals section scored highest among the sections of the WellSAT-I.

There was not a significant relationship between principal priorities on nutrition and WellSAT 2.0 sections using both comprehensiveness and strength scores. Similarly, no significant relationships were found between total scope and total mastery scores from the WellSAT-I and principal priorities on nutrition. Principal priorities on physical activity and physical education showed no association with total strength score and total comprehensiveness score from the WellSAT 2.0 . Likewise, no association was found between principal priorities on physical activity and physical education and total scope and total mastery score from the WellSAT-I.

## DISCUSSION

The present study investigated the relationship between principal nutrition priorities, physical activity priorities and written wellness policy quality as well as the degree of wellness policy implementation. It was found that the nutrition and physical activity priorities of the school principal do not appear to be related to the quality of the written policy nor the degree of policy implementation. Previous studies have found that leadership can improve written wellness policy quality and implementation.<sup>12,15,18,23-25</sup> This study expands on this idea to show that although principals serve in a leadership position within a school, principals who see nutrition and physical activity as priorities in

their school do not have better quality written policies nor do they have better policy implementation.

Previous research has shown that leadership through a single dedicated individual can improve written wellness policy quality by encouraging collaborative health efforts through creating wellness committees.<sup>15,24</sup> O'Brien et al. surveyed both students and principals and found that in schools with an individual in charge of leading wellness efforts, there was more comprehensive wellness policies compared to schools that did not have someone in charge of leading wellness efforts. O'Brien et al. utilized the Maine Schools Health Profile survey to and did not measure the quality of written wellness policies directly but rather used the survey questions to assess associations with the school health programs and policies. School level support from administrators was shown could play a role wellness policy quality, but O'Brien et al. did not specify who was classified as an administrator. Schools that had personnel assigned to lead health and wellness efforts had better school wellness outcomes such as an increase of physical activity during school hours, and a nutrition education curriculum for all grades six through 12.<sup>24</sup>

Leadership can improve wellness policy implementation through driven individuals working towards the common goal of improving the health of the students within the school.<sup>18,23</sup> Hager-Song et al. utilized a training intervention by encouraging a designated wellness position within the school and the results showed that the formation of wellness committees encouraged wellness policy implementation.<sup>23</sup> These results advocate for schools to have a designated wellness individual because schools who did, had better implementation based on a baseline and follow up survey. Research from Hager-Rubio et al. based on a self-reported online survey encourages the idea that

perceptions of school administrators as well as district and school level collaboration can impact implementation.<sup>18</sup> A study done by Agron et al. conducted key informant interviews with stakeholders from school districts, stakeholders were classified as anyone who could provide insight about school wellness policy implementation. Agron et al. found though the perceptions of key informants that a commitment to health and wellness by administrators (principal and superintendent), the school board, and a dedicated individual to guide wellness initiatives were two of the most important factors that contribute to successful wellness policy implementation.<sup>15</sup> This study speculated that gaining the support of key stakeholders (school board members, parents, students, and community members) as well as having adequate tools to support those responsible for implementation and evaluation are essential to fully implement a wellness policy. This insight was gained through an online survey as well as key informant interviews conducted at the school district level.<sup>15</sup> This evidence supports the idea of having a wellness champion or another dedicated person within the school to guide wellness initiatives.<sup>15</sup> Previous literature supports that wellness committees should be established to promote the implementation of school wellness policies.<sup>25</sup> McIlree et al. sent surveys to the individual “responsible for supporting implementation of wellness policies at the school, preferably an administrator” and the results of the study support the creation and maintenance of a wellness committee and the enhancement of implementation by using a designated wellness individual.<sup>25</sup> These articles show that having a leader and/or a committee working on school wellness efforts improves policy quality and implementation.

We speculate that our results differed from the mentioned studies because our study focused on principal priorities specifically, whereas other literature focused on administrators and stakeholders which may or may not have been the principal. They also differentiated from the present study due to the fact that district level support from administration was associated with improved wellness policy implementation and administration was noted as “the person with the responsibility of supporting implementation”. Based on this information we assume that the designated wellness individual did not have to be the principal but could have been anyone serving in a leadership position.

Each local education agency participating in the National School Lunch or National School breakfast program shall establish a local school wellness policy for schools within the school district.<sup>5</sup> School districts are encouraged to create inclusive wellness committees to plan, promote, and implement the wellness policy.<sup>5</sup> The final rule of the Healthy Hunger Free Kids Act (HHFKA) provisions include; requirements on written policy content, leadership, public involvement, triennial assessments, documentation, and public updates. It states that wellness policy leadership should consist of one or more district or school official who have authority and responsibility to ensure school complies with the policy.<sup>4</sup> Committees that are comprised of the recommended individuals will have leadership from various professions within the school encouraging committee success, however, there is not a specific requirement of who needs to be involved. Since this study researched principals’ priorities specifically, it should be noted that principals are not required to be a part of the creation of the school wellness policy at the district level. There are recommendations found in the final rule of

the Healthy Hunger Free Kids Act of who should assist with developing a school wellness including parents, students, food service managers, teachers of physical education, school health professionals, the school board, school administrators, and the general public.<sup>4</sup> There are no regulations surrounding districts that have multiple schools within their jurisdiction. This indicates that some districts that have multiple schools may only have one committee at the district level and no committee at the school level. In the HHFKA, it states that implementation is required to be measured and assessed, then shared with parents, students, school health professionals, and the general public.<sup>4</sup> The WIC Reauthorization Act of 2004 requires that a plan of implementation be established appointing one or more individual at the local education agency be tasked with operational responsibility ensuring that the school meet requirements. There are no regulations or suggestions on who should be in the designated wellness role within the school.<sup>5</sup>

There can be miscommunications due to multiple levels (writing at district level and implementation at the school level), for example if there are multiple schools in the district, not all principals may be represented in the creation of the wellness policy. If principals are not represented on school or district level committees, they are not able to communicate policy to the school level or update the district on the school implementation process. If there is no wellness committee at the school level and or representation from health leaders from the district level, communication gaps could exist between district and schools. These gaps could cause valuable information to go uncommunicated between district and school as well as decrease the potential impact of written school wellness policies. In districts with multiple schools, ideally there will be



committees at both the district and school levels to enhance communication between the two committees and to encourage overall implementation of the written policy.<sup>15,24,25</sup> The lack of regulation and the principal not serving in the designated wellness role could cause the lack of association between principal priorities and written wellness policies.

## CONCLUSION

In contrast to what was speculated, the results of this study show no association between principal priorities and wellness policy implementation. The present study yielded different results than previous literature mentioned above potentially because this study looked at principal priorities specifically, whereas the previous literature focused on the individual dedicated to improving wellness within the school, whether they were the principal or not. The lack of strict regulations on creating and implementing a wellness policy can cause a communication disconnect between the district and the school. Together with our data, this shows that although the principal is the school leader, their priorities of Nutrition and PA are not fundamental to wellness efforts. This study along with other studies show that leadership is key and can foster better quality written policies and policy implementation, which means that the principal does not have to lead the wellness effort for it to be successful. While the principal may still set the tone or influence the wellness culture at the school, having leader or team of leaders on a wellness committee appears to be the critical piece to wellness policy development and implementation. Thus, the principal role should be to support the development of a committee and support faculty time and effort towards wellness policy leadership.

## TABLES

Table 1. Matched questions from the WellSAT and WellSAT-I.

WellSAT	WellSAT-I
There is a standards-based nutrition curriculum, health education curriculum, or other curriculum that includes nutrition.	Does the school district have a standards-based nutrition education curriculum designed to promote student wellness?
All elementary school students receive nutrition education.	Do elementary school students receive nutrition education? If yes, for which grades?
All middle school students receive nutrition education.	Do middle school students receive nutrition education? If yes, for which grades?
All high school students receive nutrition education.	Do high school students receive nutrition education? If yes, for which grades?
Links nutrition education with the school food environment.	Do food service staff (i.e., cafeteria staff) and teachers collaborate in connecting nutrition education with the foods and beverages that are in school?
Nutrition education teaches skills that are behavior-focused.	There are different strategies used to teach nutrition – among these are: didactic, skills based, behavior focused, interactive, participatory and problem-based learning. How would you describe the nutrition education you provide?
No question about school gardens	Does the school have a garden? If yes, are the students involved in planting, harvesting, preparing, cooking and eating food from the school garden?
Addresses access to the USDA School Breakfast Program.	Does the school offer breakfast? IS breakfast offered every day, to all students?
Addresses compliance with USDA nutrition standards for reimbursable meals.	Have there been parts of the HFFKA regulations for breakfast and lunch that were challenging to implement?
District takes steps beyond those required by federal law/regulation to protect the privacy of students who qualify for free or reduced priced meals.	How confident are you that it is not possible for the students to identify those who qualify for free or reduced lunch?
Specifies strategies to increase participation in school meal programs.	Does the school use strategies to promote participation in school meals?
Ensures adequate time to eat.	How long are the lunch periods for students? How much time do students have to eat lunch (seated time)?

Ensures annual training for food and nutrition services staff in accordance with USDA Professional Standards.	How many hours of training do cafeteria and food service staff receive each year?
Free drinking water is available during meals.	Do students have access free water during meals in the cafeteria?
Addresses compliance with smart snacks in cafeteria for a la carte.	Cafeteria Competitive (a la carte) foods Are there competitive foods sold to students during the school day? What is the system for ensuring all items meet Smart Snacks regulations? How confident are you that all items meet Smart Snacks nutrition standards?
Addresses compliance with smart snacks for vending machines.	Vending Machines: Are there vending machines on the school campus for students during the school day? Who receives the money from the vending machines? What is the system for ensuring all items in the vending machines meet Smart Snacks regulations? How confident are you that all items meet Smart Snacks nutrition standards?
Addresses compliance for smart snacks for school stores.	School Stores Are there school stores on the school campus for students during the school day? Who receives the money from the school stores? What is the system for ensuring all items in the school stores meet Smart Snacks regulations? How confident are you that all items meet Smart Snacks nutrition standards?
Regulates food served during classroom parties and celebrations in elementary schools.	Do food-based celebrations occur during the school day (e.g., birthday parties, holiday parties)? If yes, How often do they occur? Are there restrictions on the types of foods and beverages that are permitted at parties and celebrations? How confident are you that the restrictions (if any) are followed?
Addresses availability of free drinking water throughout the school day.	Do students have consistent and easy access to free water throughout the school day?
Regulates food sold for fundraising at all times (not only during the school day).	Fundraisers Do fundraisers occur during the school day that involve selling food and/or beverages? Who is in charge of approving all fundraising activities? Do food and beverages that are used in fundraisers meet the USDA's Smart Snacks in Schools nutrition standards? How confident are you that the people/groups who conduct fundraisers understand what Smart Snacks are?
There is a written physical education curriculum for grades K-12.	Does the district have a formal written physical education curriculum for every grade?

Addresses time per week of physical education instruction for all elementary school students.	How many minutes of physical education does each grade in elementary school receive?
Addresses time per week of physical education instruction for all middle school students.	How many minutes of physical education does each grade in middle school receive?
Addresses time per week of physical education instruction for all high school students.	How many minutes of physical education does each grade in middle/high school receive?
Addresses teacher-student ratio for physical education classes.	Is the student-teacher ratio for physical education consistent with other classes of students in the same grade?
Addresses qualifications for physical education teachers for grades K-12.	Are all physical education classes taught by state certified/licensed teachers who are endorsed to teach physical education?
District provides physical education training for physical education teachers.	Is relevant (i.e., specific to PE/PA content) ongoing professional development offered every year for PE teachers?
Addresses physical education exemptions and substitutions for K-12 students.	How many students do not take PE due to exemptions or substitutions?
District addresses the development of a comprehensive school physical activity program (CSPAP) plan at each school. Click here for information on CSPAP.	Is there a comprehensive school physical activity program* (CSPAP) plan at each school?
District addresses before and after school physical activity for all K-12 students.	Are there opportunities for all students to participate in physical activity before and after school?
Addresses PA clubs/intramurals for all students and grade levels	Are there physical activity clubs and/or intramurals for all students and grade levels?
Addresses interscholastic sport opportunities for all students	Are there interscholastic sport opportunities for all students?
District addresses recess.	Is there daily recess for every grade in elementary?
Recess (when offered) is scheduled before lunch in elementary schools.	Is recess (when offered) scheduled before lunch in elementary schools?

Addresses physical activity breaks for all K-12 students.	Are teachers implementing at least 15 minutes of physical activity breaks in the classroom?
District provides physical activity training for all teachers.	Are teachers <i>trained</i> on how to conduct physical activity breaks in the classroom?
Joint or shared-use agreements for physical activity participation at all schools.	Does the school have “joint-use” or “shared-use” agreements so that community members can use indoor and outdoor school building and grounds facilities?
Encourages staff to model healthy eating/drinking behaviors.	Are school staff encouraged to model healthy eating behaviors in front of students?
Encourages staff to model physical activity behaviors.	Are school staff encouraged to model physical activity behaviors?
Addresses staff involvement in physical activity opportunities at all schools.	Are school staff encouraged to be physically active?
Addresses food not being used as a reward.	Do teachers use food as a reward in the classroom for good student behavior (e.g., giving out candy for a right answer; having a pizza party when students finish a unit)?
Addresses using physical activity as a reward.	Do teachers use opportunities for physical activity as a reward?
Addresses physical activity not being withheld as a punishment.	Are teachers prohibited from withholding physical activity as a classroom management tool (such as taking away recess, taking away PE, or taking away other opportunities to be physically active)?
Specifies marketing/ways to promote healthy food and beverage choices.	Are marketing strategies used to promote healthy foods (especially nonbranded food and beverage choices such as fruits, vegetables, and water)? These include actions such as pricing healthy products lower and placing healthiest options most prominently.
Restrictions of marketing of food and beverages on signs, scoreboards, sports equipment.	Are there food/beverage brand logos on school grounds, such as on signs, scoreboards, or sports equipment? What are they?
Restrictions of marketing of food and beverages in curricula, textbooks, websites used for educational purposes, or other educational materials (both printed and electronic)	Are there food/beverage logos or ads in curricula, textbooks, websites, computer screen savers, or digital applications (e.g. Kahoot, Google Classroom, Kidblog, etc.)?
Restrictions of marketing of food and beverages on exteriors of vending machines, food or beverage cups or containers, food display racks, coolers, trash and recycling containers, etc.	Are there food/beverage logos or ads on food service equipment and supplies (i.e., exteriors of vending machines, food or beverage cups or containers, food display racks, coolers, trash and recycling containers, etc.)?

Restrictions of marketing of food and beverages on advertisements in school publications, on school radio stations, in-school television, computer screen savers and/or school-sponsored Internet sites, or announcements on the public announcement (PA) system.	Is there food and beverage marketing in school communications – including school newspapers, school radio stations, in-school televisions, or school-sponsored Internet sites or announcements?
Restrictions of marketing of food and beverages on fundraisers and corporate-sponsored programs that encourage students and their families to sell, purchase or consume products and/or provide funds to schools in exchange for consumer purchases of those products.	Are foods and beverages promoted in fundraisers or corporate-sponsored programs that encourage students and their families to sell, purchase, or consume products that provide funds to schools in exchange for consumer purchases of those products?
Establishes an ongoing <i>district level</i> wellness committee.	Is there an active <i>district level</i> school wellness committee?
<i>District wellness</i> committee has community-wide representation.	Which groups are represented on the <i>district level</i> wellness committee? (check all that apply)
Addresses school level wellness committees/health teams/ school health advisory committee SHAC	Is there an active <b>school level</b> wellness committee? (Note: This may also be called a school health team, school health advisory committee, or similar name) If yes, how frequently does the committee meet?
Assesses clear evaluation plan to assess implementation of the policy	Does the school district have a clear evaluation plan to assess the <i>implementation</i> of the <i>district</i> wellness policy?
Public Posting/access to WP on district website	How do parents, students, and staff access the wellness policy?
Addresses district evaluation plan to assess implementation in each school building (informed by IEC4)	Does the district have a clear evaluation plan to assess the implementation of the district wellness policy in your school building?
Addresses a plan for updating policy based on best practices.	How often is the wellness policy reviewed and revised to reflect current best practices? How does the committee decide what to revise? How does the committee assess evidence-based best practices for school wellness?

Table 2. Principal Priorities

Items	Mean +/- SE
1. Budget/Finances	2.12 +/- 0.11
2. Curriculum & Instruction	1.23 +/- 0.05
3. Mental Health	1.62 +/- 0.09
4. Physical Activity/Physical Education	2.35 +/- 0.09
5. Professional Development	1.95 +/- 0.10
6. School Climate/School Culture	1.36 +/- 0.08
7. School Nutrition	2.48 +/- 0.12
8. School Safety/Violence	1.25 +/- 0.07
9. Student Performance/Scores on Standardized Tests	2.04 +/- 0.14

Table 3. WellSAT 2.0

Areas of Interest	Strength Mean +/- SE	Comp Mean +/- SE
1. Nutrition Education	30.23 +/- 2.06	76.84 +/- 3.03
2. Standards for USDA School Meals	35.53 +/- 1.76	59.87 +/- 2.31
3. Nutrition Standards	56.14 +/- 3.41	77.72 +/- 2.35
4. Physical Education and Physical Activity Standards	33.07 +/- 1.68	48.23 +/- 2.09
5. Wellness Promotion and Marketing	26.03 +/- 2.18	39.62 +/- 2.24
6. Implementation, Evaluation, Communication	28.57 +/- 2.13	52.18 +/- 2.33
<b>Total Strength Score</b>	34.81 +/- 1.72	
<b>Total Comp Score</b>	55.45 +/- 1.91	



Table 4. WellSAT-I

Areas of Interest	Scope Mean +/- SE	Mastery Mean +/- SE
1. Nutrition Education	55.49 +/- 1.85	29.02 +/- 1.84
2. Standards for USDA School Meals	92.11 +/- 0.95	72.37 +/- 1.31
3. Nutrition Standards	91.40 +/- 1.32	55.26 +/- 1.77
4. Physical Education and Physical Activity Standards	69.47 +/- 1.21	53.19 +/- 1.63
5. Wellness Promotion and Marketing	82.68 +/- 1.43	53.68 +/- 1.72
6. Implementation, Evaluation, Communication	76.69 +/- 1.76	30.83 +/- 2.03
<b>Total Scope Score</b>	76.80 +/- 0.85	
<b>Total Mastery Score</b>	50.43 +/- 1.02	

Table 5. Correlation R values.

<b>WellSAT 2.0</b>	<b>Principal Priorities on School Nutrition</b>	<b>Principal Priorities on Physical Activity Physical Education</b>
NE Comp	-0.0970	
NE Strength	-0.0292	
SM Comp	-0.0874	
SM Strength	-0.1522	
NS Comp	-0.0229	
NS Strength	-0.0616	
PEPA Comp		-0.1177
PEPA Strength		-0.0819
Total Comp	-0.1777	-0.0440
Total Strength	-0.1591	-0.0876
<b>WellSAT-I</b>	<b>School Nutrition</b>	<b>Physical Activity Physical Education</b>
NE Scope	-0.0063	
NE Mastery	0.0350	
SM Scope	0.0635	
SM Mastery	0.1065	
NS Scope	0.0185	
NS Mastery	-0.0667	
PEPA Scope		-0.0402
PEPA Mastery		0.0118
Total Scope	-0.0057	-0.0414
Total Mastery	0.0914	0.0118

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