2020

The Association between the Comprehensiveness and Strength of Written Physical Activity Wellness Policies and the Observed School Physical Activity Environment

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THE ASSOCIATION BETWEEN THE COMPREHENSIVENSS AND STRENGTH OF WRITTEN PHYSICAL ACTIVITY WELLNESS POLICIES AND THE OBSERVED SCHOOL PHYSICAL ACTIVITY ENVIRONMENT

BY

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A thesis submitted in partial fulfillment of the requirements for the

Master of Science

Major in Nutrition and Exercise Sciences

Specialization in Exercise Science

South Dakota State University

2020

THESIS ACCEPTANCE PAGE

Maggie Kringen

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.

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ACKNOWLEDGEMENTS

This manuscript is dedicated to Courtney Trapp for your ongoing support throughout these two years, I would not want to share this experience with anyone else. Thank you to Lainie, Logan, Andy, Todd, and Kim for also being my support system when I needed your encouraging words and love.

I would like to acknowledge Dr. Meendering and Dr. McCormack. Thank you so much for this opportunity to extend the knowledge of school wellness policies and the school environment. I appreciate the immense time, effort, and guidance you have given to me throughout these two years. I have thoroughly enjoyed your education in my graduate courses and your guidance for my thesis project.

Dr. Meendering, thank you for every opportunity you have offered me during my time as your graduate student. Thank you for trusting me to take the leadership role with Exercise is Medicine, I have enjoyed every moment developing this program with you and SDSU. I will use every lesson I have learned from you and let it guide me in my future career. Thank you for your sincere dedication to your students and other professors.

TABLE OF CONTENTS

ABSTRACT

THE ASSOCIATION BETWEEN THE COMPREHENSIVENSS AND STRENGTH OF WRITTEN PHYSICAL ACTIVITY WELLNESS POLICIES AND THE OBSERVED SCHOOL PHYSICAL ACTIVITY ENVIRONMENT

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Purpose: To determine if there is a relationship between physical education/activity wellness policy comprehensiveness and strength and the observed physical activity (PA) environment.

Methods: The Wellness School Assessment Tool 2.0 (WellSAT 2.0) was used to evaluate the quality of written wellness policies. The School Physical Activity and Nutrition Environment Tool (SPAN-ET) was used to evaluate the school environment. Pairwise correlations and one-way ANOVAs were used to determine if written wellness policy quality affects the school PA environment. Data are presented as mean ± SD and significance was set at $p \leq 0.05$.

Results: One significant relationship was found between WellSAT 2.0 PEPA comprehensiveness and SPAN-ET area of interest 7, which was Enclosures and Safety Features. There were no other relationships identified between the quality of wellness policies and the PA environments (n=3) and areas of interest (n=16). When comparing mean wellness policy scores among practice categories (poor, fair, good, and best practice) of the physical, situational, and policy environment, there was no difference.

Conclusion: There may be a communication disconnect in school wellness efforts between the district and school level. Schools have strong environments, but these environmental strengths are not being captured in their wellness policies.

Chapter 1: LITURATURE REVIEW

TITLE: The associations between the comprehensiveness and strength of written physical activity wellness policies and the observed school physical activity environment.

PURPOSE: The purpose of this study is to assess the relationship between the quality of written physical activity wellness policies and the school physical activity environment.

Table 1: Childhood Obesity

Author, Year, & Study Title	Sample Size & Characteristics	Study Purpose	Methods	Major Findings
Carroll et al. 2015 Prevalence of obesity among children and adolescents in Canada and the United States. NCHS data brief, no 211. Hyattsville, MD: National Center for Health Statistics. 2015.	n = not given, data collected from NHANES. Nationally representative sample of US and Canada 2-19-year-olds.	Cross-sectional survey assessing the height and weight of US and Canada 2-19-year-old individuals.	At home interview and mobile unit measurements of height and weight.	Prevalence of obesity was 5.6% among children and adolescence from 1976-1980.
Hales et al. Published: 2017 Prevalence of obesity among adults and young: United States, 2015-2016.	n= not given, data collected from 9, 2-year cycles of NAHNES. Nationally representative sample of US 2-19-year-olds.	Cross-sectional survey assessing the height and weight of US 2-19-year-old individuals.	At home interview and mobile unit measurements of height and weight.	Prevalence of obesity was 18.5% among children and adolescence in 2015-2016.

Ogden et al. Published: 2016 Trends in obesity prevalence among children and adolescents in the United States, 1988-1994 through 2013-2014	n = 40,780 US children from NHANES data. Nationally representative sample of US 2-19-year-olds.	Cross-sectional survey assessing the height and weight of US 2-19-year-old individuals.	At home interview and mobile unit measurements of height and weight.	Childhood obesity prevalence was 17.0% in 2013-2014.
Daniels et al. Published: 2005 Overweight in children and adolescents: Pathophysiology, consequences prevention and treatment	AHA Scientific Statement	Examine the pathophysiology and epidemiology of overweight in children and adolescents.	Review updated information on the adverse outcomes associated wi th childhood overweight and also examine approaches for the prevention and treatment of overweight in young individuals	Obesity prevalence in in adolescence has been shown to be associated with increased overall mortality, metabolic syndrome, orthopedic, cardiovascular, psychological, neurological, and pulmonary complications.
Serdula et al. Published: 1993 Do obese children become obese adults? A review of the literature	17 published epidemiologic reports	Longitudinal studies that examined obesity at age 6 months to 53 years old.	MEDLINE was used to search studies. Terms; obesity, adiposity, overweight, child, adults, adolescent.	The risk of having obesity as an adult is a is 2-6.5-fold for children who have obesity

KEY

NHANES: National Health and Nutrition Examination survey

US: United States

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Table 2: Wellness Policy Legislation

Public Name, Number & Issue Date	Purpose	Act of Congress	Requirements
US Congress. Public Law 108-265. Child Nutrition Reauthorization Act of 2004. Washington DC:62.	To increase nutrition and physical activity standards in school environments in order to improve upon child health and safety.	Mandatory wellness policy development for all schools participating in the NSLP, by the start of the 2006-2007 school year.	Schools are required to create a community wide represented wellness committee to write wellness policy. The wellness policy must address nutrition education, physical education, nutrition standards, NSLP compliance, and plans for wellness policy implementation and evaluation.
Us Congress. Public Law 111-296. Healthy Hunger Free Kids Act of 2010. Washing DC2010:84.	Set forth further requirements set by the Child Nutrition and WIC Reauthorization Act of 2004 to reduce childhood obesity.	Highlight wellness policy implementation and make wellness policy evaluations publicly accessible	Schools are required to develop a wellness committee that include; community members, school health professionals, school food staff, school board members, school administrators, students and parents. School wellness councils are required to continuously evaluate their wellness policy and make updates as needed which are to be available to the public.
Final Rule of 2016. Public Law: 210-235 Issued July 2016	Public schools are required to establish minimum wellness policy content requirements, to ensure mandatory participation and compliance with current regulations.	Mandatory update of wellness policy for all schools participating in the NSLP, by the start of the 2016-2017 school year.	Local government agencies must increase wellness policy transparency by evaluating updated written wellness policy and wellness policy implementation every three years.

KEY

US: United States

WIC: Women, Infant and Children

NSLP: National School Lunch Program

REFERENCES

5. United States Department of Agriculture Food and Nutrition Service. Healthy, Hunger-Free Kids Act of 2010. 2010:Public Law 108-205.

6. 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.

7. 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).

Table 3: Wellness Policy Quality

Author, Year, & Study Title	Sample Size & Characteristics	Study Purpose	Methods	Major Findings
Chriqui et al. Published: 2016 School District Wellness Policies: Evaluating Progress and Potential for Improving Children's Health Eight Years after the Federal Mandate 2006	n = 579, 641, 592, 622, 679, 698, 708, and 798 public school districts for each year from SY 2006-07 through 2013-14, respectively.	Nationally representative sample of public-school districts. Evaluate the comprehensiveness and strength of written school wellness polices.	Wellness policies were evaluated using a wellness policy coding scheme developed by Schwartz et al.	Wellness policy quality has improved from SY 2006-07 through 2013-14, however, around 45% of policy items are being addressed and only around 25% of items are being written with definitive language
Chriqui et al. Published: 2013 School District Wellness Policies: Evaluating Progress and Potential for Improving Children's Health Five Years after the Federal Mandate	n = 579, 641, 592, 622, 679, 698, 708, and 798 public school districts for each year from SY 2006-07 through 2010-11, respectively.	Nationally representative sample of public-school districts. Evaluate the comprehensiveness and strength of written school wellness polices.	Wellness policies were evaluated using a wellness policy coding scheme developed by Schwartz et al.	Wellness policy quality has improved from SY 2006-07 through 2010-11, however, around 48% of policy items are being addressed and only around 28% of items are being written with definitive language

KEY

SY: School Year

REFERENCES

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Table 4: Wellness Policy Implementation

Author, Year, & Study Title	Sample Size & Characteristics	Study Purpose	Methods	Major Findings
Berner et al. Published: 2011 Establishing a Baseline Measure of School Wellness-Related Policies Implemented in a Nationally Representative Sample of School Districts	n = 538 public school districts nationwide	Determine the percentage of school districts that met elements contained in a wellness policy coding system.	Authors used a standardized wellness policy coding system to data and matched each element to applicable questions from SHPPS and determined the percentage of districts meeting each element in the coding system.	Average 55% of nutrition policies and 20% of physical activity policies were being implemented.
Gaines et al. Published: 2010 Evaluation of Alabama Public School Wellness Policies and State School Mandate Implementation	n = 91 school districts in Alabama	Evaluate wellness policies and the progress made in the implementation of the ALSDE school food and nutrition mandates.	Wellness policies were compared to the WIC Reauthorization Act. A survey regarding compliance of ALSDE mandates were given to district superintendents.	The mean implementation of ALSDE mandates was 79%.
Belansky et al. Published: 2013 Local Wellness Policy 5 Years Later: Is It Making a Difference for Students in Low-Income, Rural Colorado Elementary Schools?	n = 45 Rural Colorado elementary schools	Assess the 5-year effects of wellness policy mandate on health practices of rural elementary schools.	1 year before and 5 years after the mandate, surveys were sent to random samples of principals, PE teachers, and food-service managers.	Minutes for PE and recess did not increase, more policies for recess and punishment were adopted, and more schools scheduled recess before lunch.

Belansky et al. Published: 2010 Early effects of the federally mandated local wellness policy on school nutrition environments appear modest in Colorado's rural, low-income elementary schools	n = 45 Rural Colorado elementary schools	Investigate changes of nutrition policies before and after the wellness policy mandate.	In 2005 and 2007 (before and after the mandate), surveys were sent to random samples of principals and food-service managers. Also, interviews were led with food-service managers 2 years after the wellness policy mandate went into effect.	An increase in the percent of schools with policies specifying mainly healthy foods be offered in classroom parties (21.4% in 2005 vs 48.7% in 2007), daily fresh fruit offerings in the lunchroom, and an increase in the percent of schools using skinless poultry (27% in 2005 vs 59% in 2007).
Probart et al. Published: 2008 Statewide Assessment of Local Wellness Policies in Pennsylvania Public School Districts	n = 499 Pennsylvania public school districts	Assess and compare wellness policies to the wellness policy mandate and provide information about wellness policy development and implementation.	Wellness policies were collected, and district representatives completed a wellness policy checklist, providing information about wellness policy development and implementation.	Most district wellness policies (85.6%-100%) met each mandate requirement, including goals for nutrition education, physical activity, etc.
Belansky et al. Published: 2009 Early impact of the federally mandated local wellness policy on physical activity in rural, low-income elementary schools in Colorado	n = 45 Rural Colorado elementary schools	Describe changes in school-level policies related to PA before and after the wellness policy mandate.	A survey about school features related to nutrition and physical activity was sent to a random sample of rural elementary schools before and after the wellness policy mandate went into effect.	Opportunities for PA did not change after the policy went into effect. Policies supporting student participation in physical education and recess also did not change.

KEY

SHPPS: 2006 School Health Policies and Programs Study

PA: physical activity

PE: physical education

ALSDE: Alabama State Department of Education

WIC: Women, Infant and Children

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Table 5: Wellness Policy Quality, Implementation, and the Observed School Nutrition Environment

Author, Year, & Study Title	Sample Size & Characteristics	Study Purpose	Methods	Major Findings
Schwartz et al. Published: 2012 Strength and Comprehensiveness of District School Wellness Policies Predict Policy Implementation at the School Level	n = 151 school districts. Connecticut school districts.	Evaluate wellness policy quality and examine wellness policy quality and degree of wellness policy implementation.	Wellness policies were evaluated using a quantitative coding system. Implementation was assessed using a nutrition and physical activity practices questionnaire.	Higher strength scores predicted greater implementation of practices.
Francis et al. Published: 2017 Quality of local school wellness policies for physical activity and resultant implementation in Pennsylvania schools	n = 15 school districts. Pennsylvania school districts with high rates of obesity.	Evaluate wellness policy quality and the degree of SWP implementation.	Wellness policies were evaluated by the WellSAT 2.0. Implementation was examined using a practices survey from the Alliance for a Healthier Generation's Healthy Schools Program.	Higher scoring policy items were associated with higher scores for the corresponding implementation items.
Martin et al. Published: 2019 Association between Written School Nutrition Wellness Policies and the Observed Nutrition	N = 26 schools within a Midwest state.	Examine the association between quality of wellness policies and the observed nutrition environment.	Wellness policies were evaluated using the WellSAT 2.0. The nutrition environment was assessed using the SPAN-ET.	WellSAT strength scores were positively associated with the observed garden features and WellSAT NE section comprehensiveness scores were negatively associated with scores

Environment within the Elementary Schools	with the observed school meals. Mean wellness policy nutrition section scores did not differ across the observed school nutrition environment.

KEY

WellSAT 2.0: Wellness School Assessment Tool

SPAN-ET: School Physical Activity and Nutrition Environment Tool

NE: Nutrition Education

REFERENCES

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Table 6: Assessment Tools

Author, Year, & Study Title	Tool Evaluation & Description	Tool Purpose	Targeted Goal Areas	Scoring System
Updated Wellness School Assessment Tool (WellSAT 2.0) Updated: 2014	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 (wellness policy monitoring and evaluation).	Standardized method to collect and evaluate consistent and reliable wellness policy scores assessing quantitative values for wellness policy strength and Comprehensiveness.	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
Schwartz et al. Published: 2009 A comprehensive coding system to measure the quality of school wellness policies	Test the range, internal reliability, and interrater reliability of a wellness policy coding system WellSAT.	Creation of a 96-item coding tool, evaluating the written strength and Comprehensiveness of the seven required goal areas for wellness policies.	6 Sections: NE (n= 9), SM (n=13), NS (n=29), PEPA (n=27), CP (n=12) and E (n=6)	0= The item is not mentioned 1= Item mentioned with confusing or weak wording 2= Item meets or exceeds expectations
John et al. Published: 2016 Developing the School Physical Activity and	Extension educators (n=12) and school personnel (n=54) from 9 rural elementary schools in Oregon.	Assesses the resources, practices, and policies of a school environment through interview and observation.	Physical Activity Section: 106 items Nutrition Section: 81 items	For an overall score, both sections are categorized together in poor, fair, good, or best practice,

Nutrition Environment Tool to Measure Qualities of the Obesogenic Context	Each section examines 3 environments: physical, situational, and policy	which is based on a percentage.

KEY

IOM: Institute of Medicine

NE: Nutrition Education

SM: Standards for USDA Child Nutrition Programs and School Meals

NS: Nutrition Standards for Competitive and Other Foods and Beverages

PEPA: Physical Education and Physical Activity

CP: Communication and Promotion

E: Evaluation

WPM: Wellness Promotion and Marketing

IEC: Implementation, Evaluation, and Communication

WellSAT: Wellness School Assessment Tool

SPAN-ET: School Physical Activity and Nutrition Environment Tool

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Chapter 2: MANUSCRIPT

INTRODUCTION

In the United States, childhood obesity has more than tripled since the 1970's[1], and data from 2015-2016 suggests that nearly one in every five children has obesity.[2] Children with obesity have a greater risk of developing chronic diseases such as type 2 diabetes, dyslipidemia, hypertension, and metabolic syndrome[3], and are also two times more likely to become obese adults than children who are not obese.[4] In efforts to prevent childhood obesity, all local educational agencies (i.e. school districts) that participate in the National School Lunch Program or other federal child nutrition programs are required by federal law to establish a wellness policy.[5–7] Wellness policies are intended to be the standard that schools and communities can use to formalize and make decisions for creating a healthy school environment through school wellness practices and programming.

Wellness policy quality has improved from 2006-07 to 2013-14[8], however, recent studies have shown that there is still considerable room for improvement in the quality of written wellness policies.[8,9] In the school year of 2013-14, 95% of school districts nationwide had developed a wellness policy, yet just under 50% of schools nationwide included all required policy elements within their wellness policy.[8,9] Throughout the 8 years of reasonable improvement, strength and comprehensiveness scores still remain low at 25.27 and 44.08 out of 100, respectively.[8] These findings suggest that there are opportunities for improvement of wellness policy quality.

The degree of policy implementation appears highly variable.[10,11,12,13,14,15] Brener and colleagues found that on average, 55% of nutrition education policy items, but only

20% of physical activity items were implemented.[10] In contrast, Gaines and colleagues observed implementation rates of 16% to 100%, with only 9 of 91 districts receiving a 100% rating, but with the majority of their sample scoring between 76% and 99% implementation.[11] There have been modest increases in degree of implementation of nutrition polices including nutrition standards for competitive foods.[12,13] However, little to no increases of physical education/activity policy implementation have been documented, including increased time for physical education but no increases in opportunities for physical activity and recess.[14,15] These results suggest that school level implementation of wellness policy components, especially physical education and physical activity, also have room for improvement.

The quality of wellness policies has been shown to predict the degree of implementation, such that, stronger and more comprehensive wellness policies can lead to a greater degree of policy implementation.[16,17] Schwartz and colleagues reported that higher written wellness policy strength was associated with higher implementation of health promoting practices.[16] Francis et al. examined wellness policy quality and the degree to which physical activity policies were being implemented.[17] Data indicated that there was a strong, positive correlation with policy quality and the degree of policy implementation.[17] These studies display that the quality to which wellness policies are written, can impact the degree of policy implementation. Though, researchers mentioned that there are apparent limitations from both studies, such that, all policy implementation data was collected through self-report.[16,17] This creates a large opportunity for bias due to school administrators possibly over-reporting implementation of their policies.

A recent study from Martin and colleagues went beyond interviewing school personal, and also observed the school environment to determine if the school nutrition environment was associated with the quality of school nutrition policies.[18] Although Marin et al. found a positive correlation between wellness policy strength scores for nutrition standard policies and observed garden features in the nutrition environment and a negative correlation between wellness policy comprehensiveness scores for nutrition education policies and observed school meals in the nutrition environment, no relationship was seen between the written wellness policy and the majority of the school nutrition environment variables.[18] This relationship is unknown for physical education/activity policies and the physical activity environment, therefore, the purpose of the present study is to investigate the relationship between the strength and comprehensiveness of written physical education/activity wellness policies and the observed school physical activity environment.

METHODS

School Recruitment

The Department of Education sent an email to 110 schools within a rural Midwest state inviting participation in the present study. Schools were asked to complete an initial electronic questionnaire to confirm their interest for participating as well as to give follow-up contact information. A member of the research team followed up with a school representative to further discuss the study logistics. Written and verbal consent was obtained. Participating schools were asked to submit a current version of their school wellness policy and schedule a date for an onsite school visit to assess the school wellness environment. Researchers evaluated the quality of the wellness policy offsite

using the Wellness School Assessment Tool version 2.0 (WellSAT 2.0)[19,20] and examined the observed school environment using the School Physical Activity and Nutrition Environment Tool (SPAN-ET)[21] during their site visit for each participating school. After completing the WellSAT 2.0 and SPAN-ET, scores were calculated individually by two trained researchers, differences were discussed, and an agreement was reached for each item. The study was approved by the South Dakota State University Institutional Review Board and deemed exempt as it was not classified as human subjects research.

School Demographics

Demographic data from participating schools were collected in the academic year of 2017-2018 from the National Center for Educational Statistics (https://nces.ed.gov/). Demographic variables included school enrollment, race, and percentage of students eligible for free or reduced lunch.

Assessments

Written wellness policy quality (strength and comprehensiveness) was assessed using the electronic WellSAT 2.0.[19,20] The strength score evaluates the definitiveness of the language that is used within the policy whereas the comprehensiveness score reflects the extent to which recommended content areas are addressed. The WellSAT 2.0 contains 78 items divided among 6 sections: Nutrition Education (NE), Standards for United States Department of Agriculture (USDA) School Meals (SM), Nutrition Standards for Competitive and Other Foods and Beverages (NS), Physical Education and Activity (PEPA), Wellness Promotion and Marketing (WPM), and Implementation, Evaluation, and Communication (IEC). Each item is scored “0” (not mentioned), “1” (weak statement), or “2” (meets or exceeds expectations). Strength scores are calculated by

adding the number of items that scored "2" and dividing by the number of items in the policy section then multiplying that number by 100. Comprehensiveness scores are calculated by adding the number of items that scored "1" or "2" and dividing by the number of items in the policy section then multiplying that number by 100. The total strength score is calculated by adding all of the items that scored "2", dividing by 78, then multiplying by 100. The total comprehensiveness score is calculated by adding all of the items that scored "1" or "2", dividing by 78, then multiplying by 100.[19,20]

The school wellness environment was assessed by using the SPAN-ET.[21] The SPAN-ET utilizes face-to-face and/or telephone interviews, direct observation, and content review to gather a complete assessment of the school environment. The SPAN-ET is broken down into two categories; physical activity and nutrition. There are 16 areas of interest (AOIs) within the physical activity category and 11 within the nutrition category. The physical activity category AOIs include: 1. Indoor Space, 2. Outdoor Space/Fixed Features, 3. Shelter and Shade Structures, 4. Natural Features, 5. Garden Features, 6. Surface and Surface Markings, 7. Enclosures and Safety Features, 8. Neighborhood Features, 9. Portable Equipment, 10. Atmosphere/Ambiance, 11. Movement Opportunities, 12. Before/After School and Summer Extracurricular Programs, 13. Garden Space, 14. Physical Activity and Wellness Policy, 15. Physical Activity and Wellness Committee, and 16. Structured Physical Education. The AOIs are categorized as part of the physical environment (AOI 1-8), situational environment (AOI 9-13), or policy environment (AOI 14-16). Each AOI and environment is categorized as poor practice (<25%), fair practice (26-50%), good practice (51-75%), or best practice (76-100%) based on the percentage of criterion met.[21]

DATA ANALYSIS

All data was presented as means ± standard error. Statistical significance was set at $p \leq 0.05$. Data was analyzed using Stata Statistical Software: Release 14. Pairwise correlations were used to determine if individual AOI scores within the observed physical activity environments of the SPAN-ET were significantly associated with written wellness policy scores from the WellSAT 2.0 PEPA section. One-way ANOVAs were used to determine if mean PEPA section scores for WellSAT 2.0 differed among categorical practice scores (poor, fair, good, and best practice) of the SPAN-ET physical, situational, and policy environment in the physical activity category. Post-hoc tests using Bonferroni examinations were used to determine if groups differed from one another.

RESULTS

Twenty-five schools, within twenty-two school districts in South Dakota participated in this study. Schools varied in size from 40 to 660 students with a mean enrollment of 212 students. Approximately 9% of students were non-white ranging from 1% to 21% across participating schools. Over 34% received free or reduced lunch ranging from 9% to 60% across participating schools.

Descriptive data displaying wellness policy quality from the WellSAT 2.0 is shown in Table 1. The total comprehensiveness and strength scores were 45.4% $\pm$ 4.2% and 24.6% $\pm$ 3.7%, respectively, out of 100 possible points. The PEPA section scored second highest in both comprehensiveness and strength behind the NE section. Descriptive data for the SPAN-ET physical activity category, including physical, situational, and policy environments and overall environment scores, is presented in Table 2. The overall school physical activity category score for all environments was

69.9% ± 1.2% (out of 100%). In each environment, the majority of schools scored in the good practice category. In the physical activity category, the policy environment had the highest average, followed by the situational environment, and the physical environment. AOI 9: Portable Equipment scored highest, followed by AOI 11: Movement Opportunities, and AOI 1: Indoor Space. The lowest scoring AOIs were 5: Garden Features and 13: Garden Space.

Correlations between SPAN-ET physical activity environments, SPANT-ET physical activity AOIs and the WellSAT 2.0 PEPA section comprehensiveness and strength are presented in Table 3. There was one significant positive correlation between WellSAT 2.0 PEPA comprehensiveness and AOI 7: Enclosures and Safety Features and ($r = 0.42$, $p \leq 0.03$). There were no other significant correlations seen between the quality of WellSAT 2.0 PEPA section comprehensiveness or strength and the observed SPAN-ET physical activity environments and AOIs.

Mean WellSAT 2.0 PEPA section scores across the SPAN-ET physical activity category for the physical, situational, and policy environments and frequencies are displayed in Table 4. There was no difference in WellSAT 2.0 PEPA section comprehensiveness nor strength across categories (fair, poor, good, best) of the physical activity physical, situational, and policy environments.

DISCUSSION

The present study examined the relationship between the quality of physical education/activity sections of the district level wellness policy and the observed physical activity environment and found the physical activity environment within a school is not related to the comprehensiveness nor strength of the district level wellness policy. We

speculate that the lack of relationship observed in the present study may be due to a disconnect between school wellness efforts occurring at the district versus school levels.

The disconnect between the written wellness policy and the school environment may be caused by a difference in school wellness efforts occurring at the district versus school level. Schools that participate in federally funded nutrition programs are required to have a school wellness policy at the district level.[6] According to the Final Rule of 2016 parents, students, teachers of physical education, school health professionals, school food authorities, school administrators, the school board, and members of the general public are to be permitted to participate in the development of wellness policies.[7] Although districts and schools are encouraged to create structured wellness committees composed of these individuals, there is not a specific requirement as to if a committee is needed at the district and school level in districts with more than one school nor is there a specific requirement regarding who needs to be involved at minimum. We speculate that a communication disconnect develops between the district and school level because wellness policies are written at the district level, but implementation of the wellness policies occur at the school level. It might be easier to identify who should be a part of the district level wellness committee in a district with only one school because each potential committee member is already a key player at that particular school. However, since individual schools are not required to have their own wellness committee[7], school districts with more than one school building may have difficulty identifying which individual to represent each role on the district level wellness committee because each school has their own school health professional, physical education teacher, and school administrator. Without a wellness committee at the school level and/or representation of

all of the key players from each school on the district level, communication about all of the wellness efforts happening at the school level may not be passed up to the district level committee for inclusion in the wellness policy and policy components may not be adequately passed down to key players at the school level to facilitate implementation. Results from this study show that schools, individually, are doing good things to support a healthy school environment because the majority of schools scored in the good practice category of the SPAN-ET, but their wellness policies were, on average, low, suggesting that all of the positive wellness practices happening within schools may not be included within the wellness policy. These findings suggest that each school within a district may benefit from developing a wellness committee and districts may benefit from having all school level committee members serve on the district level committee because there may be better communication flow from schools to the district and from the district to the school.

A similar disconnect between district and school levels was seen in a recent study that examined the relationship between wellness policy quality and the observed school environment. Martin et al. assessed the comprehensiveness and strength of the nutrition sections of written wellness policies using the WellSAT 2.0 and the school nutrition environment using the SPAN-ET and assed the relationship between the two.[18] There were two correlations from this study, one positive correlation between WellSAT 2.0 strength scores for the NS section and the observed garden features AOI and one negative correlation between WellSAT 2.0 comprehensiveness scores for the NE section and the observed school meals AOI. Additionally, there were no significant differences in wellness policy quality across the observed school nutrition environment.[18] Our study

builds upon the study from Martin and colleagues to show that there are some associations between wellness policy quality and the observed school physical activity environment, and in addition to there being no differences between quality of school nutrition policies and the school nutrition environment, there were also no differences between the quality school physical education and physical activity polices and the school physical activity environment. Martin and colleagues speculated that this disconnect was caused by not capturing healthful practices that were happening in the school nutrition environment within the written wellness policy.[18] Likewise, we speculate this disconnect to also be due to schools not capturing good practices for physical education and physical activity within their written policy.

Unpublished data from our laboratory further support this idea that schools are doing many good things to support healthy nutrition and physical education/activity behaviors but are not capturing it within their written wellness policies. Our laboratory examined the relationship of wellness policy quality of written policies and degree of policy implementation using the WellSAT and the WellSAT-I, respectively. School personnel who were interviewed reported that all physical education and physical activity practices were being implemented, however, only half of the practices were being reported in the wellness policy. This data suggests that schools are doing good things within the school environment to support nutrition and physical activity, but do not always capture all of these positive practices within their written policy. This may be caused from district level and school level disconnect as previously stated.

A limitation to this study is that, currently, there is not an environmental assessment tool that is directly matched for the 20 items in the WellSAT 2.0 PEPA section nor is

there is a policy guide that is comprehensive of the 106 items within the SPAN-ET physical activity category. The WellSAT 2.0 and SPAN-ET are widely used and highly respected assessment tools to assess wellness policy quality and the school environment, therefore, were used in this study. When comparing the tools, the SPAN-ET physical acitivty category criteria covers 17 out of the 20 items from the WellSAT 2.0 PEPA section, however, the distribution of the AOIs/criteria from the SPAN-ET is not even across the three environments. The SPAN-ET physical activity physical environment has one out of eight AOIs and the situational environment has three out of five AOIs that overlap with the WellSAT 2.0 PEPA section. On the contrary, every AOI from the policy environment overlaps with the WellSAT 2.0 PEPA section, however, there are only a total of three AOIs in this environment, which accounts for only 19% of the total AOIs from the entire SPAN-ET physical activity category. Overall, 79 out of 100 criteria from the SPAN-ET physical activity category does not overlap with the WellSAT 2.0 PEPA section, to which, the majority of the unmatched criteria comes from the physical and situational environment. Wellness policies do not always include the physical or situational environment (i.e. garden features, neighborhood features, atmosphere/ambiance etc.) because it may not be appropriate for a policy to include due to the difficulty to change the items within those environments but those items do impact the school health environment and therefore are included in the SPAN-ET. Despite differences in the items covered within each tool, the SPAN-ET physical activity policy environment was nearly a perfect match with the WellSAT 2.0 PEPA section yet results from this study still showed no association between the written policy strength and comprehensiveness and the environment. Thus, although the different variables within

the tools is a limitation to consider, we feel strongly that the findings point to a disconnect between the district written policy and the school environment.

CONCLUSION

The current study fills the gap between wellness policy quality and the observed school physical activity environment. This study also brings to light a possible disconnect of district level policy creation and school level implementation. Current results demonstrate that schools are doing healthful things to support a healthy school environment but are not always capturing these practices in the wellness policy. It is important to assess each school's environment to document all of the good practices that are happening and reflect those practices in the district policy. Closer communication between the district and schools could possibly happen if individual schools developed their own wellness committee to communicate their healthful practices to district policy developers so that those practices are captured in the district wellness policy.

TABLES

Table 1: Mean ± SE WellSAT 2.0 section scores

Section	Comprehensiveness (%)	Strength (%)
Nutrition Education (NE)	73.2 ± 6.4	33.7 ± 6.1
Standards for USDA Child Nutrition Programs and School Meals (SM)	41.3 ± 3.9	26.8 ± 3.4
Nutrition Standards for Competitive and Other Foods and Beverages (NS)	43.3 ± 5.5	21.8 ± 4.6
Physical Education and Physical Activity (PEPA)	50.6 ± 6.3	31.3 ± 5.4
Wellness Promotion and Marketing (WPM)	33.3 ± 4.2	21.4 ± 3.9
Implementation, Evaluation and Communication (IEC)	30.8 ± 6.6	12.7 ± 4.4
Overall Score	45.4 ± 4.2	24.6 ± 3.7

Table 2: Mean ± SE SPAN-ET Physical Activity (PA) Category Environments and Areas of Interest.

Physical Activity Category (# of criterion)	SPAN-ET Score (Mean ± SE)
Physical Environment (50)	67.4 ± 1.4
Indoor Space (15)	86.7 ± 1.5
Outdoor Space/Fixed Features (9)	82.2 ± 2.9
Shelter and Shade Structures (3)	14.7 ± 5.1
Natural Features (4)	80.0 ± 2.8
Garden Features (3)	4.0 ± 2.9
Surface and Surface Markings (4)	81.0 ± 4.1
Enclosures and Safety Features (7)	77.7 ± 3.0
Neighborhood Features (5)	75.2 ± 4.8
Situational Environment (32)	71.0 ± 2.0
Portable Equipment (5)	98.4 ± 1.1
Atmosphere/Ambiance (7)	68.6 ± 2.5
Movement Opportunities (6)	90.0 ± 2.5
Before/After School and Summer Extracurricular Programs (11)	68.7 ± 4.5
Garden Space (3)	1.33 ± 1.3
Policy Environment (24)	73.7 ± 1.6
Physical Activity and Wellness Policy (10)	82.0 ± 2.1
Physical Activity and Wellness Committee (5)	39.2 ± 5.4
Structured Physical Education (9)	83.6 ± 1.3
Overall PA Environment (106)	69.9 ± 1.2

Table 3: Correlation between SPAN-ET Physical Activity (PA) Environments and Areas of Interest and WellSAT Physical Education and Physical Activity (PEPA) section Comprehensiveness (Comp) and Strength.

SPAN-ET PA Environments and Areas of Interest (total criteria)	WellSAT PEPA Comp	WellSAT PEPA Strength
PA Physical Environment	0.32	0.09
Indoor Space (15)	-0.02	-0.16
Outdoor Space/Fixed Features (9)	0.11	0.003
Shelter and Shade Structures (3)	0.25	0.19
Natural Features (4)	-0.13	-0.32
Garden Features (3)	0.04	-0.01
Surface and Surface Markings (4)	0.11	0.10
Enclosures and Safety Features (7)	0.42*	0.20
Neighborhood Features (5)	0.30	0.21
PA Situational Environment	0.26	0.19
Portable Equipment (5)	0.07	0.06
Atmosphere/Ambiance (7)	0.08	0.13
Movement Opportunities (6)	0.16	0.22
Before/After School and Summer Extracurricular Programs (11)	0.24	0.10
Garden Space (3)	0.23	0.38
PA Policy Environment	-0.10	-0.22
Physical Activity and Wellness Policy (10)	-0.08	-0.06
Physical Activity and Wellness Committee (5)	-0.06	-0.16
Structured Physical Education (9)	-0.04	-0.26
Overall PA Environment	0.27	0.08

*$p \leq 0.05$

Table 4: Mean ± SE WellSAT 2.0 Physical Education Physical Activity (PEPA) section Comprehensiveness (Comp) and Strength scores across SPAN-ET Physical Activity (PA) Physical, Situational, and Policy Environment section scores.

WellSAT PEPA Section	**SPAN-ET PA Category**				
	Physical Environment				
	Poor	Fair	Good	Best	p-value
Frequency			(88%)	(12%)	
PEPA Comp	-	-	48.1 ± 6.7	68.3 ± 15.9	0.30
PEPA Strength	-	-	31.7 ± 5.9	28.3 ± 13.0	0.84
	Situational Environment				
	Poor	Fair	Good	Best	p-value
Frequency		(8.0%)	(56.0%)	(36.0%)	
PEPA Comp	-	22.0 ± 0.0	51.1 ± 8.6	56.1 ± 10.6	0.39
PEPA Strength	-	22.0 ± 0.0	29.9 ± 7.1	35.6 ± 10.4	0.79
	Policy Environment				
	Poor	Fair	Good	Best	p-value
Frequency			(68.0%)	(32.0%)	
PEPA Comp	-	-	50.8 ± 7.3	50.0 ± 12.7	0.95
PEPA Strength	-	-	32.8 ± 6.5	28.1 ± 10.0	0.69
	Overall PA Environments				
	Poor	Fair	Good	Best	p-value
Frequency			(84.0%)	(16.0%)	
PEPA Comp	-	-	48.0 ± 6.9	63.8 ± 15.3	0.36
PEPA Strength	-	-	30.1 ± 5.7	37.5 ± 17.1	0.62

*$p \leq 0.05$

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