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RESEARCH ARTICLE

Wellness Committee Status and Local Wellness Policy Implementation Over Time

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Introduction: Local Wellness Policies are school-district documents containing guidelines for schools to promote nutrition/physical activity. In cross-sectional studies, schools with wellness committees are more likely to implement Local Wellness Policies. This prospective cohort study examines associations between wellness committee status over time and change in Local Wellness Policy implementation using a biennial, statewide survey.

Methods: School administrators completed surveys following the 2012−2013 (Wave I) and 2014−2015 (Wave II) school years, including a 17-item Local Wellness Policy implementation scale. Four wellness committee status categories included established (both Waves, 35%); new (Wave II only, 22%); discontinued (Wave I only, 13%); and never (neither Wave, 30%). Linear mixed models conducted in 2017−2018 compared LWP implementation change across status groups, accounting for clustering and school characteristics.

Results: Of 1,333 schools, 701 had Wave I data (53%); 748 Wave II (56%); and 441 both (33%). Schools were 69% elementary, 56% suburban, and 35% and 28% had majority (≥75%) African American/Hispanic or low-income student body, respectively. At Wave I, schools with wellness committees (established/discontinued groups) had higher Local Wellness Policy implementation (mean=32.0, SD=11.5, and mean=28.3, SD=11.4, respectively) compared with schools without committees (never/new: mean=15.4, SD=10.7 and mean=17.6, SD=11.4, respectively, F=64.9, p≤0.001). Over time, never and established groups maintained low and high Local Wellness Policy implementation, respectively. Compared with never, new committees increased implementation by 9.9 points (SE=1.8, p<0.001), and discontinued committees decreased by 11.2 (SE=2.1, p<0.001).

Conclusions: Forming and maintaining wellness committees encourages Local Wellness Policy implementation and should be a recommended strategy for school wellness promotion.

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INTRODUCTION

Childhood obesity is a significant public health concern.[1] Approximately one fifth of American children are obese,[2] increasing their risk of type 2 diabetes, cardiovascular disease, bone and joint problems, poor self-esteem,[3,4] and adult obesity.[5] Schools are often targeted for obesity prevention interventions because children spend much of their day in school, and up to 50% of a child's daily calories are consumed there.[6] In order to create environments more conducive to healthy eating and physical activity at school, the federal government enacted legislation in 2004 requiring all school districts (also known as Local Education Agencies) that participate in federal meal programs to create Local Wellness Policies (LWPs), written documents containing guidelines for nutrition education and promotion, physical activity, and wellness activities, with

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the ultimate goal of improving child health outcomes.[7] Research examining the impact of LWP implementation on student health is limited; however, LWPs were rated as "promising" and "emerging" strategies for childhood obesity prevention by a new policy review system.[8]

Although nearly all school districts (97%) have LWPs in place and LWP content has improved over time,[9,10] recent evidence suggests that insufficient support structures are in place for implementation at the school level.[10] In 2016, a final rule stemming from the 2010 Healthy, Hunger-Free Kid Act (HHFKA) attempted to address this implementation gap by enhancing LWP requirements to include increased public involvement in LWP development, stakeholder participation in implementation and periodic review of the LWP, and public notification regarding content, implementation, and compliance in schools.[11] School districts had to be in compliance by June 30, 2017.

Although there is limited literature on factors associated with school-level LWP implementation, several cross-sectional studies have reported that schools with school-level health councils or wellness committees engage in greater LWP implementation, such as enhanced nutritional quality of vending machines.[12,13] Longitudinal studies are needed to understand the impact of wellness committee status on LWP implementation over time (status is defined as the extent to which schools form a new wellness committee over time or lose their wellness committee).

Strong measures are needed to reliably capture LWP implementation. Several tools have been developed, including surveys[12,14,15] and interviews.[16] In 2012, the authors, in partnership with the Maryland departments of education and health, developed a survey based on the School Nutrition Policies and Practices Survey[15]; Maryland Wellness Policy Implementation Checklist (developed by the department of education); Alliance for a Healthier Generation healthy schools program framework in place in 2012[17]; and the HHFKA.[18] The tool included 17 items specific to school-level nutrition and physical activity practices typically outlined in a LWP (e.g., monitoring and reporting, staff wellness, family involvement, rewarding with food, and recess). To date, there is no gold standard with which to compare the tool for criterion-related validity, but the scale had acceptable test–retest reliability (r =0.70) and internal consistency (Cronbach's α=0.92).[12] This scale has been implemented in research studies to describe factors associated with LWP implementation[12] and wellness committee best practices[19] and to examine the impact of school-level approaches to enhancing LWP implementation.[20]

The Maryland Wellness Policies and Practices Project (MWPPP) supports statewide LWP implementation through continuous quality improvement, including administration of biennial school-level surveys, which include the 17-item scale described above. The MWPPP provides a longitudinal data source to understand the impact of wellness committee status on LWP implementation. This study uses survey data from the 2012–2013 and 2014–2015 school years to examine the relationship between wellness committee status over time and LWP implementation. Schools that never had a wellness committee are hypothesized to maintain a low level of LWP implementation, whereas schools with established committees are hypothesized to maintain a high level of LWP implementation. Compared with schools that never had a wellness committee, schools with new wellness committees are hypothesized to have greater improvement in LWP implementation and schools that discontinue their wellness committees are hypothesized to experience a decline in LWP implementation.

METHODS

Study Sample

This study employed a prospective cohort study design. The MWPPP school survey was developed in partnership with the state departments of education and health to examine actionable school-level LWP implementation constructs. The survey was distributed via e-mail to the individual "responsible for supporting implementation of wellness policies at the school, preferably an administrator." All procedures were approved by the university and state department of health IRBs. As respondents reported on policies/practices within their school and did not provide personally identifying information, written informed consent was not required.

Maryland public schools in all 24 school districts were included with part-time, alternative, exclusively prekindergarten, or exclusively special education schools excluded. The survey was distributed in the summer 2013 (Wave I) and summer 2015 (Wave II). Respondents were asked to reflect on the previous school year when responding. Only schools with complete survey data at both waves were included in the analysis.

Measures

School-level LWP implementation was assessed using the previously described 17-item scale.[12,19,20] Scale items are shown in Table 1, with the full survey available online.[21] All items were assessed using a 4-item Likert scale, coded as follows: *fully in place*=3 points; *partially in place*=2 points; *under development*=1 point; *not in place/don't know*=0 points. A sum score was calculated (maximum possible score=51) for each school at each wave.

The MWPPP school survey measured wellness committee presence at each wave with one item: *"My school had a School Health Council or wellness team responsible for implementing LWPs in place during the 20XX-20XX school year,"* with response options *yes*, *no*, and *don't know*. The responses were dichotomized: present=*yes* versus not present=*no/don't know*. Wellness committee status was determined by responses at Waves I and II:

Table 1. Local Wellness Policy (LWP) Implementation Items (Reprinted With Permission[12] and Available Online[21]) Used to Generate a Sum Score, With Wave I Responses

	Implementation categories[a]			
My school...	**Fully in place, %**	**Partially in place, %**	**Under development, %**	**Not in place/Don't know, %**
1. Monitors implementation of the LWP	28.3	35.4	15.4	20.9
2. Provides annual progress reports to the school system on school-level implementation of LWPs	20.9	23.1	12.7	43.3
3. Communicates the status of school-level implementation of LWPs to school staff	27.4	29.5	16.8	26.3
4. Communicates the status of school-level implementation of LWPs to parents/families	15.9	34.2	16.6	33.3
5. Provides opportunities for parent input on LWP implementation	11.8	28.3	18.4	41.5
6. Provides opportunities for student input on LWP implementation	10.4	28.1	16.8	44.7
7. Has secured funds from the school system to support nutrition and physical activity priorities for students and staff	15.9	20.9	11.1	52.2
8. Has secured outside/private funds to support nutrition and physical activity priorities for students and staff	15.9	15.2	11.6	57.4
9. Has integrated nutrition and physical activity goals into the overall school improvement plan	20.4	24.0	18.8	36.7
10. Exceeds school system requirements regarding nutrition guidelines for foods served outside of the national school breakfast and lunch programs (a la carte, vending, etc.)	19.7	27.2	12.9	40.1
11. Exceeds school system requirements regarding nutrition/health education	22.0	27.9	16.1	34.0
12. Exceeds school system requirements regarding physical education	33.6	29.9	12.7	23.8
13. Exceeds school system requirements regarding physical activity (physical activity breaks during the day, active recess, etc.)	33.3	30.2	20.9	24.0
14. Partners with community organizations to support and promote healthy eating and physical activity among students	24.9	30.2	20.9	24.0
15. Has activities involving families to support and promote healthy eating and physical activity among students	21.8	32.7	21.1	24.5
16. Has activities for staff members that support and promote healthy eating and physical activity	32.7	32.9	21.3	13.3
17. Has provided training/education to encourage staff to model healthy eating and physical activity behaviors	20.6	26.5	23.4	29.5

[a]Each item coded as follows: 3=fully in place; 2=partially in place; 1=under development; 0=not in place/don't know.

established=wellness committee present at Waves I and II; discontinued=Wave I only; new=Wave II only; and never=absent at Waves I and II.

School demographics were provided by the state. School size was categorized due to skewness (skewness=2.1, kurtosis=6.2) into small (≤400 students); medium (401–800 students); and large (>801 students). School type was examined using three categories: elementary or elementary/middle, middle or middle/high, and high. Racial/ethnic composition of the student body was examined as predominantly African American or Hispanic (≥75%) versus not. Percentage of students eligible for free and reduced-price meals, a proxy for majority low-income student body, was subdivided into three categories <40%, 40%–75%, and ≥75%. Geographic location was assigned based on National Center for Educational Statistics criteria,[22] with five root definitions ranging from large city to rural. For this analysis, the five root definitions were collapsed into three categories: rural/town, suburban, city/urban.

Statistical Analysis

Analyses were performed using SPSS statistical software, version 22, and Stata, version 12, in 2017–2018. School demographic characteristics were examined in the full sample and then compared across wellness committee status categories using chi-square tests. School characteristics were examined in association with LWP implementation score using *t*-tests or ANOVA with Tukey's post hoc tests when significant differences were found. LWP implementation mean scores at each timepoint were plotted by wellness committee status to visually portray changes over time.

A linear mixed model with LWP implementation as the dependent variable was performed, adjusting for school characteristics related to LWP implementation at baseline, with random intercepts at the school and district level to account for clustering of repeated measures within schools and clustering of schools within districts. The interaction between time X wellness committee status was included, with "never" as a reference group. The change in LWP implementation over time for each category of committee

status was estimated. The difference in change over time for each committee was compared with never.

RESULTS

Of 1,333 schools that were eligible and present at both Wave I and Wave II, 733 schools completed the survey at Wave I (55.2%) and 799 at Wave II (59.2%), with 441 schools at both Waves I and II (34.2% of the total eligible; Appendix Figure 1). There were no differences in school demographics between those included in the analysis (n=441) compared with those excluded (n=892) with respect to race/ethnicity of student body and geographic location. Included schools were more likely to have a low-income student body (27.7%, with ≥75% free and reduced-price meals vs 20.2% among those excluded, chi-square=11.2, p=0.004). Compared with those that responded to Wave I only (n=260), those that responded at both Waves I and II (n=441) had a higher Wave I LWP implementation score (23.3 vs 21.1, t=2.2, p=0.030) and were more likely to have a wellness committee at Wave I (47.8% vs 37.7%, chi-square=6.8, p=0.009).

School demographics are described in Table 2. Most schools were elementary or elementary/middle (68.5%), and more than half were located in a suburban geographic location (56.2%). About one third of schools (35.4%) had a majority African American or Hispanic student body, and more than a quarter (27.7%) had a majority low-income student body. About a third of schools (35%) belonged to the established wellness committee group, with 22.2% to the new group, 13.2% to the discontinued group, and 29.9% to the never group (Table 2).

A significant relationship was found between wellness committee status and geographic location (p<0.01); race/ethnicity of students (p<0.05); and low-income status of students (p<0.05; Table 2). Schools with established wellness committees were more likely to be in a suburban locale. Schools in the discontinued category were more likely to have both a predominantly African American/Hispanic and low-income student body.

No significant differences in LWP implementation at baseline were found by number of students, student body race/ethnicity, low-income student body, or geographic location (p>0.10). As significant differences were found by school type based on post hoc tests, with lower scores (mean=18.0, SD=11.7) among high schools compared with elementary/elementary middle (mean=24.4, SD=13.6) and middle/middle high (mean=23.5, SD=13.6) schools, school type was included as the covariate.

Significant differences in LWP implementation at Wave I were identified across wellness committee categories (F[3, 437]=64.9, p<0.001; Table 3). From Tukey's honestly significant difference post-hoc testing, schools with wellness committees reported greater implementation (established mean=32.0, SD=11.5, and discontinued mean=28.3, SD=11.4) than schools without committees (never mean=15.4, SD=10.7, and new mean=17.6, SD=11.4). No pairwise differences were found between established/discontinued or new/never.

Figure 1 depicts the raw change in LWP implementation by wellness committee status. The linear mixed model (Table 3) determined that, when adjusting for school type, compared with schools that never had a wellness committee, schools with new committees increased LWP implementation by 9.9 points (b=9.9, SE=1.8, p<0.001), whereas schools with discontinued committees decreased LWP implementation by 11.2 points (b= −11.2, SE=2.1, p<0.001). No significant differences were identified in change in LWP implementation score among schools with never and established wellness committees.

DISCUSSION

This longitudinal study of Maryland public schools demonstrates the importance of school-level wellness committees for implementation of federally mandated LWPs. Compared with schools that reported never having a wellness committee, schools that built a new wellness committee demonstrated an improvement in LWP implementation, whereas schools that discontinued their wellness committee showed a decline in LWP implementation. Schools with an established wellness committee maintained a high level of LWP implementation over time, with a stable trajectory.

This study adds to several cross-sectional studies that have shown that schools with wellness committees or wellness coordinators report higher LWP implementation, compared with schools that do not have a wellness committee.[12,14,23] In addition, this study supports recommendations by the U.S. Department of Agriculture[24] national school-based health promotion programs, such as Alliance for a Healthier Generation[25] and Action for Healthy Kids,[26] and the HHFKA 2017 final rule[11] that schools and school districts allocate resources and provide sustained support for wellness committees to aid with LWP implementation.

The longitudinal aspect of this study allowed for an examination of the differential impact of building, maintaining, or discontinuing a wellness committee over time. Schools with new wellness committees experienced

Table 2. Maryland School Characteristics at Wave I, 2012–2013 School Year (*n*=441)

Characteristics	Schools, *n* (%)	Wellness committee status[a] *n* (%)				χ^2 (*p*-value)	LWP implementation score[b] (Wave I)	
		New	Established	Discontinued	Never		Mean ± SD	*F*(*p*) or *T*(*p*)
Maryland, 2012–2013 school year		98 (22.2)	153 (34.7)	58 (13.2)	132 (29.9)		23.3 ± 13.4	–
Number of students/school						4.3 (0.639)		1.24 (0.292)
Small (≤400)	102 (23.1)	18 (17.6)	41 (40.2)	15(14.7)	28 (27.5)		24.8 ± 12.8	
Medium (401–800)	245 (55.6)	55 (22.4)	85 (34.7)	30 (12.2)	75 (30.6)		23.3 ± 13.7	
Large (≥801)	94 (21.3)	25 (26.5)	27 (28.7)	75 (30.6)	29 (30.9)		21.7 ± 13.2	
Type of school						9.0 (0.175)		6.28 (0.002)
Elementary	302 (68.5)	61 (20.2)	116 (38.4)	39 (12.9)	86 (28.5)		24.4 ± 13.6	
Middle	73 (16.6)	18 (24.7)	22 (30.1)	12 (16.4)	21 (28.8)		23.5 ± 13.2	
High	66 (15.0)	19 (28.8)	15 (22.7)	7 (10.6)	25 (37.9)		18.0 ± 11.7	
Race/ethnicity of student body						9.7 (0.022)		−0.10 (0.941)
≥75% African American/Hispanic	156 (35.4)	25 (16.0)	54 (34.6)	29 (18.6)	48 (30.8)		23.4 ± 13.6	
<75%	285 (64.6)	73 (25.6)	99 (34.7)	29 (10.2)	84 (29.5)		23.3 ± 13.4	
Low-income student body[c]						15.6 (0.016)		0.83 (0.437)
<40%	164 (37.2)	35 (21.3)	64 (39.0)	10 (6.1)	55 (33.5)		22.5 ± 13.3	
40%–74.9%	155 (35.1)	35 (22.6)	55 (35.5)	28 (18.1)	37 (23.9)		24.4 ± 13.6	
≥75%	122 (27.7)	28 (6.3)	34 (27.9)	20 (16.4)	40 (32.8)		23.0 ± 13.4	
Geographic location						18.0 (0.006)		1.79 (0.168)
Urban	98 (22.2)	21 (21.4)	22 (22.4)	13 (13.3)	42 (42.9)		22.1 ± 12.7	
Suburban	248 (56.2)	53 (21.4)	92 (37.1)	39 (41.1)	64 (25.8)		24.4 ± 13.8	
Rural or town	95 (21.5)	24 (25.3)	39 (41.1)	6 (6.3)	26 (27.4)		21.9 ± 13.1	

[a]Wellness Committee Status over two waves of data collection (Wave I 2012–2013 school year and Wave II 2014–2015 school year): "new"=Wave II only; "established"=wellness committee at Waves I and II; "discontinued"=Wave I only; "never"=absent at Waves I and II.
[b]Local wellness policy (LWP) implementation score was assessed using a 17-item scale. A sum score was calculated (maximum possible score=51) for each school.
[c]% eligible for free/reduced priced meals.

Table 3. Change in Local Wellness Policy (LWP) Implementation Score by Wellness Committee Status and the Difference in the Changes (*n*=441)

Wellness committee status[a]	Wave I (2012–2013), Mean±SD	Wave II (2014–2015), Mean±SD	Estimated change in LWP implementation score[b] over time		Estimated difference in change in LWP implementation score over time (compared to "never")	
			Mean (SE)	*p*-value	Mean (SE)	*p*-value
Never	15.4 ± 10.7	16.9 ± 10.5	1.5 (1.2)	0.200	–	–
New	17.6 ± 11.4	29.0 ± 11.7	11.4 (1.4)[c,d]	<0.001	9.9 (1.8)	<0.001
Established	32.0 ± 11.5	33.2 ± 11.8	1.3 (1.1)[c,e]	0.248	−0.2 (1.6)	0.878
Discontinued	28.3 ± 11.4	18.6 ± 9.8	−9.7 (1.8)[d,e]	<0.001	−11.2 (2.1)	<0.001

[a]Wellness committee status over two waves of data collection (Wave I 2012–2013 school year and Wave II 2014–2015 school year): "new"=Wave II only; "established"=wellness committee at Waves I and II; "discontinued"=Wave I only; "never"=absent at Waves I and II.
[b]Local wellness policy (LWP) implementation score was assessed using a 17-item scale. A sum score was calculated (maximum possible score=51) for each school.
Significant differences were found in the changes over time:
[c]Comparing established to new (χ^2= −10.2, SE=1.7, p<0.001).
[d]Comparing discontinued to new (χ^2= −21.2, SE=2.2, p<0.001).
[e]Comparing discontinued to established (χ^2= −11.0, SE=2.1, p<0.001).

a significantly greater change in LWP implementation compared with schools that never adopted a wellness committee. New wellness committees may make marked improvements in LWP implementation because of enacting "low-hanging fruit" policies or practices, a metaphor that refers to changes made to the environment that do not require much expense, training, or time to implement.[27] It was observed that schools with an established wellness committee showed a sustained level of LWP implementation over time, without continued growth. Committees may reach a point where more support is needed to make complex changes to the school environment, and the required financial, time, or personnel resources are no longer available. The current

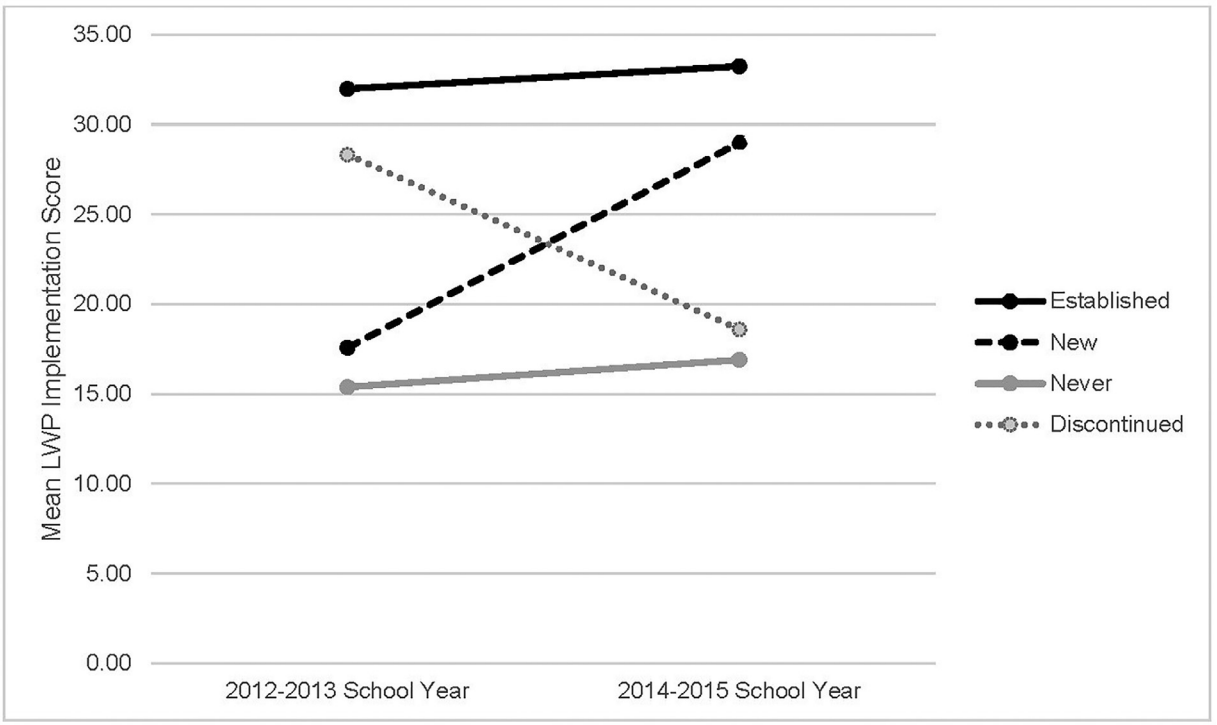

Figure 1. LWP implementation over time by school wellness committee status category.
LWP, local wellness policy.

findings suggest the need for schools and districts to allocate adequate time and resources for committees to continue to set and accomplish LWP-related goals.

Future, mixed methods studies can expand this work by investigating how committees function (e.g., to what extent they meet best practice recommendations regarding composition, meeting frequency, goal setting), as well as to understand more about the barriers that may prevent further improvements in LWP implementation. A recent cross-sectional analysis indicated that committees that meet best practice recommendations are more likely to implement LWPs compared with committees that do not meet these recommendations.[19] Additionally, a recent randomized intervention study found that training teachers to be wellness champions and lead school-based wellness committees was effective at enhancing LWP implementation via the formation of committees that met best practice recommendations.[20] Investigation of the status of these best practices over time can provide a more mechanistic understanding of how committees increase LWP implementation and inform allocation of resources for wellness committees to form, remain active, and continue to accomplish goals.

High schools had a lower LWP implementation score at Wave I. Given that the majority of school-based obesity prevention interventions have focused on elementary schools, with fewer targeting high schools, this finding aligns well with the current literature.[28,29] Because of small cell sizes for wellness committee status, a stratified analysis was not possible to examine if findings differed by school type. Future studies should focus on high schools to further understand barriers to LWP implementation.

Schools that discontinued their wellness committee experienced a decline in LWP implementation over time compared with schools that never had a wellness committee. Although understanding the organizational reasons for the loss of a wellness committee is beyond the scope of this study, this study did find that schools with a majority low-income or racial/ethnic-minority student body were more likely to lose their wellness committees. Prior studies have similarly demonstrated disparities in LWP implementation among schools with a predominantly minority race/ethnicity student body,[10,30] suggesting a need for further longitudinal exploration of barriers, such as lack of technical support, financial resources, time, resources, staff turnover, or coordination of policy[14,30–32] that may specifically affect the formation and maintenance of wellness committees in under-resourced schools. Understanding specific barriers in schools serving at-risk students should be prioritized.

The current study uniquely contributes to the literature on the relationship between wellness committee presence and LWP implementation in schools by providing longitudinal evidence. Additionally, it uses a large, statewide sample and a reliable and comprehensive measurement tool (MWPPP survey).

Limitations

A primary limitation involves the potential for selection bias. The outcome variable required responses at both Wave I and Wave II; thus, listwise deletion was employed and schools that responded to only one survey were excluded. After examining possible biases, using the data available, schools included in the analysis were more likely to have a predominantly low-income student body, on average, compared with those who either responded to the survey only once or not at all. Also, schools that did not respond a second time had a lower average LWP implementation score at Wave I and were less likely to have a wellness committee. Other school demographic differences were not detected based on inclusion or exclusion in the analysis. Taken together, these findings may limit generalizability. Additionally, the excluded schools may experience a pattern of LWP implementation over time that differs from the four groups described in this analysis. Future studies with more than two time points could employ more sophisticated modeling to reduce bias.

Additional limitations include having a single respondent per school. Also, the 17-item scale assessing LWP implementation, although shown to be reliable, has not been validated. To date, there is no gold standard for comparison. Including additional respondents and supplemental measures (e.g., audits/observations) would allow for the measurement of consistency among respondents and may increase validity. Although this scale is also intended to be comprehensive and examine the multiple dimensions of LWP implementation, it does limit the ability to focus on specific LWP areas. Additionally, as the exact time point that wellness committees were formed or discontinued was not identified, it is not possible to fully align these points with the time frame during which LWPs were implemented. Future studies would benefit from more precise timeline measurements. A more detailed exploration of wellness committee characteristics would also provide additional context for understanding the supports schools need to maintain wellness committees over time. In addition, a mixed methods approach could capture contextual factors that may aid in understanding why schools built, maintained, or lost their wellness committees. Finally, this study did not examine student outcomes. It is imperative for future studies to be conducted that can examine the impact of LWP implementation on student health and academic outcomes.

CONCLUSIONS

These findings add a longitudinal dimension to the emerging body of literature exploring the characteristics of wellness committees and their impact on LWP implementation, underscored by the importance of adopting and maintaining a wellness committee over time. Implications include laying the groundwork for ongoing evidence-based guidance to schools in order to achieve full, sustainable LWP implementation. Study findings could be used by school districts and schools to advocate for resources and funding for school-based wellness committees to support LWP implementation. This study is timely in light of the HHFKA final rule, which requires school districts or schools to establish wellness policy leadership to ensure LWP compliance.[11] As the ultimate goal of LWP implementation is to improve student outcomes, future research should examine wellness committee formation and stability as a mechanism for enhancing LWP implementation and the role of these efforts in student outcomes.

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SUPPLEMENTAL MATERIAL

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