



## The Healthy Champions program in Pennsylvania schools: Assessment, awareness, and improvement of school wellness

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### ABSTRACT

Schools are important environments for promotion of healthy behaviors to reduce childhood obesity; however, many barriers prevent schools from sustaining wellness programs. The goal of the Healthy Champions program was to assist schools with identifying areas for improvement through a nutrition and activity-focused assessment, and delivery of a customized score report and welcome kit with materials to promote healthful behavior change. In this study, we aimed to describe participation and assessment results for this program across a five-year period. Enrollment in the Healthy Champions program was open to private and public K-12 schools across Pennsylvania beginning in 2013. School staff completed an assessment that scored aspects of the wellness environment and was used to enroll schools in the program. Schools were awarded star status (0–5) based upon responses and provided a tailored response to improve ratings, and with re-enrollment, became a simple way for schools to track progress. From 2013 to 2018, 592 schools enrolled for at least one year, representing 58 out of 67 counties (87%) in Pennsylvania. Mean star status at baseline was 2.89 out of 5; however, schools enrolled for multiple years (51%) saw significant improvement in star status, independent of school size and rural/urban status.

### 1. Background

One out of three American children ages 10–17 has overweight or obese, triple the rate from just one generation ago (Ogden et al., 2016; NSCH, 2016). Given the role of physical activity and proper nutrition in achieving healthy weight, the American Academy of Pediatrics recommends children achieve at least 60 min of physical activity and consume five or more servings of fruits and vegetables each day (AAP, 2015). Unfortunately, the majority of youth do not meet these recommendations (Relations, 2014; Kann and McManus, 2018). How well youth manage the balance between eating and physical activity (i.e., achieve energy balance) strongly influences their overall health and risk of developing obesity as an adult (Hill et al., 2012; Biro and Wien, 2010). Ensuring proper energy balance is a critical part of reducing childhood obesity and preventing accompanying chronic diseases associated with high personal, economic, and social costs.

Schools have been widely regarded as important environments for implementing health behavior interventions and promotion of healthy habits to reduce childhood obesity (Graziose et al., 2017; Kropski et al., 2008; Mahmood et al., 2014; Wang et al., 2003). In addition, schools

participating in the Federal School Lunch Program (National School Lunch Program Reports, 2016) are required to establish comprehensive school wellness policies and active wellness councils. A critical first step to making healthful changes in the school environment is to identify current needs. As part of the Every Student Succeeds ACT (ESSA) passed in 2015, annual needs assessments are now required by schools (ESSA, 2015). These assessments are intended to identify strengths and weaknesses of current wellness policies for improving student health. Despite regulation, recent studies demonstrate that many school districts still fail to provide strong and specific language in their policies, which leads to lack of enforcement (Harvey et al., 2018; Francis et al., 2017). Other studies have shown that implementation of wellness policies is low, inconsistent, or nonexistent, due to several barriers including lack of funding, staff time, and available resources (Schuler et al., 2018), indicating a need to offer support to school districts to make improvements following annual assessments.

In Pennsylvania (PA), 31.7% of children ages 10–17 have obesity or overweight (NSCH, 2016), which is higher than national averages. This epidemic indicates a tremendous opportunity for PA schools to create an environment supportive of healthy eating and physical activity. The

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Healthy Champions program was developed by Penn State PRO Wellness to provide 1) an annual web-based nutrition and activity focused assessment completed by a school staff member to identify strengths and weaknesses of policies and programs for promoting health, 2) a customized report describing results and tailored opportunities for improvement for the following year, and 3) a welcome kit mailed to the school building with health education and promotion materials to support the school environment in making those improvements. The purpose of this study was to describe participation and assessment results for the Healthy Champions program for enrolled schools across PA from 2013 to 2018.

## 2. Methods

### 2.1. Participants

Enrollment in the Healthy Champions program was free of charge to all private and public K-12 schools across PA from school years 2013–2014 through 2017–2018. Across five years of the program, 592 schools enrolled for at least one year, representing reach across 58 out of the 67 counties (87%) in PA. Both urban ( $n = 393$ ) and rural ( $n = 199$ ) schools enrolled and were identified as such by their respective county designation ([The center for Rural Pennsylvania, xxxx](#)). School student population ranged from 12 students to 3166 students.

### 2.2. Instrumentation

The Healthy Champions Assessment is a web-based survey that was adapted from the CDC's School Health Index (SHI) ([School Health Index, 2012](#)) by Penn State PRO Wellness. Though comprehensive, the SHI typically requires input from multiple staff, making it time consuming and labor intensive to complete. Therefore, the Healthy Champions program simplified the SHI, including only modules that were related to nutrition, activity, and overall school culture supportive of those topics ([Appendix A](#)). The simplified assessment [Table A1](#) scored aspects of school wellness and identified areas for improvement that could be addressed using low cost strategies. Survey items were selected based on Institute of Medicine (IOM) recommendations for goals and strategies to prevent obesity ([Accelerating Progress in Obesity Prevention, 2019](#)) Strengths of each school's wellness practices were determined based on responses to the following categories: (1) Improving Community Partnerships, (2) Improving Nutrition and Nutrition Education, (3) Improving Health Promotion, (4) Improving Physical Education and Physical Activity, and (5) Improving Employee Wellness.

### 2.3. Procedure

#### 2.3.1. Recruitment

PRO Wellness recruited PA private and public K-12 schools via phone and email invitation. Contact information was maintained on a roster and recruited schools were identified from a purchased state-owned list of school contacts. The enrollment period ran April through June annually.

#### 2.3.2. Assessment

To complete enrollment, a staff member, teacher, school nurse, or administrator at the school building (wellness champion) completed the survey utilizing REDCap, a secure web application for building and managing online surveys. Researchers analyzed assessment data to create individual category scores, which were used to award schools with an overall star status. Star status scores ranged from 0 to 5, with 5 representing the healthiest practices. Based upon category scores, schools were provided a report with customized recommendations and goals for improving overall star status. While schools did not compete against one another for star status, the goal was to reach a score of 5. A

welcome kit of program and event resources (physical and electronic) was provided to enrolled schools in September (three months following the close of enrollment) to assist them with improving their star status over the next school year.

#### 2.3.3. Scoring individual categories

Assessments were scored upon closing enrollment each June. Five topical categories (CATs) were used to calculate star status: (1) Improving Community Partnerships in Schools ( $n = 6$  questions), (2) Improving Nutrition and Nutrition Education in Schools ( $n = 6$  questions), (3) Improving Health Promotion in Schools ( $n = 6$  questions), (4) Improving Physical Education and Physical Activity in Schools ( $n = 6$  questions), and (5) Improving Employee Wellness in Schools ( $n = 6$  questions). Individual CAT star totals were used to determine the CAT star total and award star status on a scale of 0–5 as outlined below.

#### 2.3.4. Awarding star status

Baseline CAT star totals and overall star status were calculated for each category using data from the first year of participation from each school. These values represent the mean baseline star total for each school prior to receiving any assistance, programming, materials, or communication from Penn State PRO Wellness. School demographics (e.g., contact information, total number of students, grades served) and a qualitative assessment question (i.e., how the organization is a champion for bringing healthy choices to life) were excluded from the star status calculation. Assessments of nutrition services included in CAT 2 were excluded from the star status calculation if the school did not have a food service program. In this instance, the CAT was omitted from evaluation. Individual CAT star totals were used to determine overall star status. The sum CAT star totals were divided by 5 (or 4 if nutrition services were omitted), then rounded to produce an overall star status ranging from 0 to 5, with 5 representing the healthiest practices.

#### 2.3.5. Recommendation for school wellness program improvement

At the start of the school year (August/September), schools were provided with a customized report containing results of their awarded star status. The report also included three recommended areas for improvement based on the school's lowest performance areas. Schools were encouraged to set goals for attaining the next level star status in the following years and provided simple, evidence-based ideas to support improvement in each of the three lowest performance areas. Suggestions for improvement were developed using recommendations from key leaders in school health, including the CDC and Robert Wood Johnson Foundation ([Austin et al., 2006](#)). Analysis of areas for improvement across all schools enabled our team to customize resources appropriately year to year.

#### 2.3.6. Welcome kit

The purpose of the welcome kit was to provide schools with a starting point for implementing small changes in their environment to promote school health. The kit contained a promotional banner, infographic posters, and a customized Champion report with an access code to a Champions-only web portal housing electronic resources (social media toolkits, posters, monthly newsletters, and webinars) available throughout the school year. Tools and resources to host and promote four signature events (Apple Crunch, Walk to School Day, Go for the Greens, and Move it Outside) were also included on the web portal. Schools were encouraged to engage students, staff, and community members in these fun, seasonal events as a way of self-promoting the successes and wellness priorities of each participating school. The nutrition events were designed to encourage students to develop healthy nutritional habits, with a focus on eating fruits and vegetables. The physical activity events were designed to encourage students to expend 50% of their daily energy while in school, as recommended by the IOM ([Accelerating Progress in Obesity Prevention, 2019](#)), and develop

healthful activity habits for life.

Through templates for planning outreach events, suggestions for establishing community partnerships, and tools for launching in-school programs, the kit provided resources to support increased consumption of fruits and vegetables, healthier beverage choices, 60 min of daily physical activity, and awareness of proper portion size and caloric balance. Technical assistance, in the form of phone calls, emails, and site visits, was provided to the participating schools upon request during the school year to respond to questions regarding their assessment, results, recommendations, or use of the welcome kit.

#### 2.4. Data analysis

To confirm validity of the five-year data set, manual deletion of false attempts (i.e., when participants initiated but did not complete the enrollment assessment) was performed each year. Duplicate submissions for schools were identified by conditional formatting then deleted, keeping only the most recent record to track program participation. Schools that enrolled a district versus a school were excluded from the analysis and star status award. Additionally, data from 11 entries were removed from analysis that represented organizations (instead of schools) or schools outside of PA. Schools were categorized by the size of the school ( $< 500$  or  $\geq 500$ ), the school locale (rural, urban), and number of years enrolled in the program (1, 2, 3, 4, 5). School size was recorded for schools listed in the National School Lunch Program reports (ESSA, 2015). The school size was defined by the median:  $< 500$  students and  $\geq 500$  students for schools with population information ( $n = 504$ ). Schools were rated on a 5-point scale (star status) in five categories as well as overall for each year in the program. Because schools were enrolled in the program for various time periods, the first year of enrollment was used as the baseline measure and the final year (2, 3, 4, or 5) was used as the end of program measure and compared to baseline.

##### 2.4.1. Statistical methods

All variables were summarized prior to analysis with frequencies and percentages or means, medians, and standard deviations. The distributions of continuous variables were assessed using histograms, box plots, and normal probability plots. Because the ratings were ordinal, the baseline ratings overall and for the individual 5 categories were compared between the groups listed above for school size, school locale, and years in program using a Wilcoxon Rank Sum test or Kruskal Wallis test. For making comparisons of the overall mean change in star status, a paired t-test (mean) or McNemar's test (percentage) was applied. Analysis of covariance (ANCOVA), which adjusted for the baseline measure as well as the school size, school locale, and years in program, was utilized to make comparisons of the mean change in ratings from baseline to the final year in the program within and between the group variables. An overall significance level of 0.05 was applied, with the p-values from the ANOVA analysis adjusted using Tukey's method for multiple comparisons. All analyses were performed using SAS version 9.4 (SAS Institute, Cary, NC).

### 3. Results

#### 3.1. Participation

Enrollment in the Healthy Champions program varied from year to year but increased annually from 57 schools in Year 1 to 297 schools in Year 5 (Fig. 1). Over the 5-year program period, a total of 592 schools enrolled, and 51% ( $n = 303$ ) of schools enrolled returned for at least a second year, allowing researchers to examine change in star status across multiple years of enrollment. Forty-seven percent of the schools enrolled during year 1 maintained participation throughout the entire 5-year period.

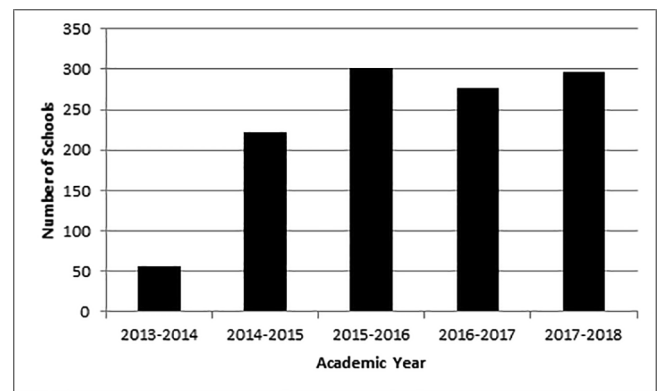


Fig. 1. Enrollment Information.

#### 3.2. Baseline star status

##### 3.2.1. Individual CAT star totals

Overall, the lowest baseline CAT star totals across schools were recorded for Improving Employee Wellness and Improving Health Promotion, with the highest CAT star totals recorded for Improving Community Partnerships. There was a significant difference noted ( $p = 0.002$ ) between schools with enrollment  $< 500$  and  $\geq 500$  for Improving Community Partnerships (Table 1).

##### 3.2.2. Overall star status

Overall star status at baseline for schools participating in the Healthy Champions program was not affected by school size and locale.

#### 3.3. Effect of re-enrollment

For schools that were enrolled for multiple years ( $n = 303$ ), mean CAT star totals and overall star status were calculated at baseline (first year enrolled) and end (final year enrolled).

##### 3.3.1. Individual CAT star totals

There was a significant increase from baseline to program end within CAT star totals for Improving Community Partnerships (3.87–4.14,  $p < 0.001$ ), Improving Nutrition and Nutrition Education (2.57–3.38,  $p < 0.001$ ), Improving Health Promotion (2.45–2.99,  $p < 0.001$ ), and Improving Physical Activity and Education (2.81–2.98,  $p = 0.030$ ) in all schools.

##### 3.3.2. Overall star status

There was an increase from baseline to program end for overall star status within all school types (2.89–3.17,  $p < 0.001$ ), but no statistically significant difference between different school sizes or locale (rural/urban).

#### 3.4. Effect of number of years of enrollment

To further identify the effect of enrollment, mean CAT star totals and overall star status change was assessed for schools enrolled for more than one year and categorized to describe the effect of 2 years, 3 years, 4 years, or 5 years of enrollment. There was a significant increase from baseline to end for overall star status in schools enrolled for 4 years (2.89–3.38) or 5 years (3.26–3.48) only Fig. 2.

### 4. Discussion

Schools enrolled in the Healthy Champions program for multiple years (51%) saw significant improvement ( $p < 0.05$ ) in assessment categories related to establishment of community partnerships, nutrition and nutrition education, physical activity and physical education,

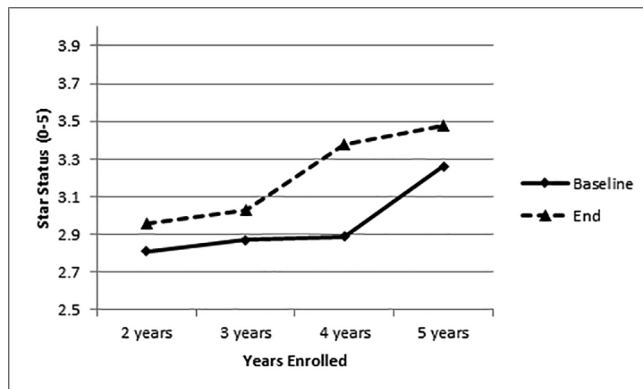
**Table 1**  
Mean CAT Star Totals and Star Status (0–5) by School Characteristics at Baseline.

Characteristic	Group <sup>c</sup>	N	Improving Community Partnerships	Improving Nutrition & Nutrition Education	Improving Health Promotion	Improving Physical Activity and Education	Improving Employee Wellness	Star Status
Size of school	< 500	251 <sup>b</sup>	3.63 ± 1.34 <sup>a</sup>	2.80 ± 1.65	2.33 ± 1.91	2.80 ± 1.21	1.82 ± 1.56	2.80 ± 1.01
	≥ 500	253 <sup>b</sup>	3.98 ± 1.24 <sup>a</sup>	2.82 ± 1.64	2.28 ± 1.90	2.64 ± 1.32	1.77 ± 1.62	2.81 ± 1.00
School locale	Rural	199	3.78 ± 1.22	2.66 ± 1.68	2.42 ± 1.90	2.61 ± 1.31	1.71 ± 1.62	2.76 ± 1.02
	Urban	393	3.77 ± 1.33	2.72 ± 1.68	2.24 ± 1.87	2.74 ± 1.23	1.84 ± 1.57	2.79 ± 0.99

<sup>a</sup>  $p < 0.05$ .

<sup>b</sup> Size data available for schools listed in National School Lunch Program reports ( $n = 504$ ).

<sup>c</sup> Means, Wilcoxon Rank Sum test or Kruskal Wallis test used to make group comparisons.



**Fig. 2.** Star Status for Schools Enrolled for 2, 3, 4, or 5 Years.

and health promotion. This improvement suggests that the Healthy Champions program may have a positive impact on the school environment. It is vital to the success of school wellness programs to exhibit change in these areas, and maintain or improve the other positive performance areas, in order to strengthen obesity prevention efforts. A closer look at the trends in overall star status for schools indicates those enrolled for 4 or more years in the program had a significant improvement from baseline to end of program. This suggests it can take several years for a school building to become aware of their own strengths and weaknesses in school policy and to effectively implement change.

It is well documented that schools have difficulty facilitating change in health practices despite federal mandates (Francis et al., 2017; Schuler et al., 2018; Smith et al., 2012; Probart et al., 2010). Although schools participating in the National School Lunch Program are required to have an established wellness policy and active wellness council, a study of PA school districts (Totura et al., 2015) revealed that only 28% identified a wellness coordinator to oversee wellness efforts. This limits the ability of the school to sustain quality programs for students and staff and makes it very difficult for schools to even identify their needs. Because most needs assessments require involvement of multiple staff and a significant time commitment, and programming known to improve the school wellness environment is often costly, labor intensive, and unsustainable (Rasberry et al., 2011), it is necessary to identify alternative solutions to assist schools in wellness efforts. The Healthy Champions program offers a simplified assessment and enrollment in a free program that provides promotional resources and suggestions for simple improvements in the school environment, offering an important first step to establishing healthful behavior change. Enrollment in the Healthy Champions program increased over the 5-year period, but more importantly, re-enrollment for more than one year occurred at a rate of 51%. Of the original schools that enrolled in year 1, 47% maintained participation throughout the entire 5-year period. Rates of re-enrollment in this program may indicate its value to participating schools in PA.

Individuals make decisions, healthy or otherwise, within the context of the social environment in which they spend most of their time. Schools share the responsibility with families and communities to foster an environment that provides opportunities for students to learn about and practice healthy behaviors, especially because healthy eating and regular physical activity affect students' academic performance (Trudeau and Shephard, 2008). Wellness policies require goals for promotion of healthful behaviors, as schools represent an ideal setting for health promotion given their ability to reach a broad range of students in a cost-effective way. The Healthy Champions program encourages wellness through a variety of mechanisms, customized to the school's assessed needs. For example, signature events aimed to engage students, staff, and community members to develop healthy nutritional habits, with a focus on eating fruits and vegetables, or to look for opportunities to participate in physical activity. In schools that enrolled for multiple years, there was a significant increase in overall star status and all individual categories except for Improving Employee Wellness. This indicates potential benefit of the Healthy Champions materials, as well as an opportunity for future resources to address employee programs more directly. Though we did not directly evaluate use of the welcome kit, if utilized, these free resources helped schools implement requirements of their wellness policy, improve assessment results, and may have provided additional incentive for schools to re-enroll.

## 5. Limitations

This study has several limitations that should be considered. All assessment data is self-reported by school staff, so it is possible that social desirability bias may have resulted in exaggerated responses. Further, for schools enrolled for multiple years, it is possible that different staff members completed the assessment each year. In addition, schools that did see changes in star status from with multiple years of enrollment may have seen improvement because they were already motivated to do so. Importantly, although the assessment captures information related to changes in the school wellness environment, promotion, and practices, it is difficult to know if the changes reported are a direct result of the Healthy Champions program, other school-based initiatives or federal mandates. We analyze differences in assessment data, and did not administer a pre- and post-test to capture the specific use or effectiveness of resources provided. In addition, we did not evaluate actual changes made to the school environment, including participation in signature events, level of engagement, or number of promotional items used. However, the program did create awareness of strengths and weaknesses in school health policy and practices through assessment completion and feedback, and provide resources to implement small changes which may spur school buildings to revamp wellness councils and make improvements beyond program expectations. Follow up with these school buildings to understand how they have evaluated success and which improvements have been sustained would be key next steps to understanding the effect of the Healthy Champions program. Lastly, as the data are derived from a single state, findings may not be generalizable to other states, although schools across the

nation are likely to have similar challenges and barriers to implementing healthful programming.

**6. Conclusions**

The ESSA recognizes the need for schools to support the whole child and also acknowledges the value of health and wellness in supporting learning and academic achievement. Regular assessments enable a school to identify target areas to improve the culture of wellness. The Healthy Champions program was designed to assist schools with fulfilling an annual assessment requirement, with the addition of a customized score report. Because the Healthy Champions program provides a score report after enrollment, annual re-enrollment is a simple way to track and evaluate progress and areas of need. Schools enrolled in the program demonstrated improvement in star status with multiple years of enrollment and across the majority of the individual categories, indicating that this program may overcome typical barriers that schools

face in identifying and improving needs in school wellness environments and practices.

**Human Subjects Approval Statement**

The Human Subjects Protection Office has determined that the above activity does not meet the definition of human subjects research, therefore, Institutional Review Board (IRB) review and approval is not required.

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**Appendix A**

Table A1.

**Table A1**  
Healthy Champions Assessment Questions.

<b>Community Engagement</b>	
Does your school participate in health related activities throughout the community?	Yes/No
Does your school communicate with the families of students about health-related activities or programs?	Yes/No
Does your school offer school-sponsored intramural programs or physical activity clubs for boys and girls?	Yes/No
Can all students use your school's indoor or outdoor physical activity facilities outside school hours?	Yes/No
<b>Health Education Curriculum</b>	
Does your school's health education curriculum address how physical activity can contribute to a healthy weight?	Yes/No
Does your school's health education curriculum address reading and using food labels?	Yes/No
<b>Nutrition Services</b>	
Does your school provide places to purchase food and beverages?	Yes/No
Does your school require that all foods sold adhere to the USDA's "All Food Sold in Schools" standards? (aka. Smart Snacks in School)	Yes/No
Does your school make safe, unflavored drinking water available through the day at no cost?	Yes/No
Does your school encourage non-food related fundraising activities?	Yes/No
Does your school offer both fruits and vegetables every day of the week?	Yes/No
Does your school offer only fat-free or low-fat milk?	Yes/No
Does your school identify healthier food and beverage choices with signs or symbols?	Yes/No
<b>Health Promotion and Policy</b>	
Does your school have a health council or equivalent?	Yes/No
Does your school health council (or equivalent) meet two or more times per year?	Yes/No
Does your school health council (or equivalent) implement policy change for physical activity or nutrition at least annually?	Yes/No
Does your school set objectives for student health promotion?	Yes/No
Does your school have a champion(s) who is a strong advocate for healthy choices and policies?	Yes/No
Does your school promote or support walking and bicycling to school?	Yes/No
<b>Physical Education and Physical Activity</b>	
Does your school offer physical education classes?	Yes/No
Do all students receive physical education class throughout the school year?	Yes/No
Do all students in each grade receive physical education for the recommended number of minutes per week throughout the school year? (150 min for Elementary Schools, 225 min for Middle/High Schools)	Yes/No
Does your school use assessment tools to evaluate physical education curriculum? (i.e., School Health Index, PECAT)	Yes/No
Does your school prohibit using physical activity and withholding physical education class as punishment?	Yes/No
Are physical activity breaks (or energizers) used in the classroom by teachers in your school? (i.e. TAKE 10!)	Yes/No
<b>Organization Policies for Faculty/Staff</b>	
For employee meetings where food is served, does your school make healthier food and beverage options available?	Yes/No
Does your school post signs at elevators, stairwell entrances or exits and other key locations that encourage employees to use the stairs?	Yes/No
Does your school provide educational seminars, workshops, or classes on physical activity and nutrition for employees?	Yes/No
Does your school make any health promotion programs available to family members of employees?	Yes/No
Does your school have an active health promotion committee that includes a focus on employees?	Yes/No
Does your school promote and market health promotion programs to employees?	Yes/No

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