The Physical Educator Vol. 80 • pp. 657–676 • 2023
https://doi.org/10.18666/TPE-2023-V80-I6-11664

PHYSICAL ACTIVITY

Impact of an After-School Club on Elementary Students' and Staff Members' Physical Activity Levels, Mood Levels, and Stress Levels

Katherine McGovern and Pamela Hodges Kulinna

Abstract

Guided by the conceptual framework of the Comprehensive School Physical Activity Program (CSPAP), the purpose of this study was to determine if a walking club after school for teachers and students increased physical activity levels, reduced stress, and improved mood. The participants were 51 (67% male, 33% female) fourth- to eighth-grade students and eight staff members at a charter school in the Southwest United States, along with nine comparison teachers. They participated in an 8-week after-school walking/running club twice a week for 45 min. Participants wore a pedometer and completed validated instruments to assess stress levels and mood. Descriptive statistics were performed. Group differences were explored with t tests. Overall, the average number of steps during the 13 school days for students was 7,657 (SD = 2,661). The after-school program added an additional 2,585 (SD = 699) steps to their day. Staff members were less active at school with 5,896.33 (SD = 2,617) steps, but equally or more active in the after-school program with 3,063 (SD = 331) steps. The t-test results were significant, showing students and teachers reported less stress

Katherine McGovern, Mary Lou Fulton Teachers College, Arizona State University, and Department of Physical Education, Legacy Traditional School. Pamela Hodges Kulinna, Mary Lou Fulton Teachers College, Arizona State University. Please send author correspondence to pkulinna@asu.edu

at the end of the program. Only staff members completed the mood instrument, and there were significantly more positive mood indicators and fewer negative mood indicators at the posttest. Comparison teachers had similar steps at school. Because the intervention group of teachers reported more stress at pretest, their decreased stress values were similar to the comparison teachers at posttest. Participating in an after-school walking/running club can increase daily physical activity, decrease stress levels, and improve overall mood, specifically, if teachers want to feel more interested and inspired and less distressed, irritable, and nervous.

Obesity among children in the United States is becoming more and more prevalent. According to SHAPE America and the American Heart Association (2016), 1 in 3 kids ages 2 to 19 are overweight or obese and almost none of them meet the recommended physical activity recommendations. This can lead to serious health complications in adulthood. This study aimed to show the positive effects of a walking club on physical activity, stress reduction, and emotional health. Another aim of this study was to create a positive atmosphere among the adults and students. Students look up to their teachers and adults on campus, so if students see their teachers model physically active behaviors, this can motivate them to be involved in the club or be active as well.

The framework of this study was the conceptual model of the Comprehensive School Physical Activity Program (CSPAP). This study provided students the opportunity to be physically active after school and work toward recommended 60 min of physical activity a day. It is valuable because it shows that not all physical activity has to be vigorous. Many children and adults do not think of walking as physical activity, and it can be an easy way to be active. Because it is an easy way to be active, more individuals are likely to do it. Given students are not getting enough physical activity, this study can help promote physical activity after the school day.

Many youth are too inactive, not reaching the 60 min of daily physical activity and, overall, are not given the opportunity for recommended levels of physical education (SHAPE America and the American Heart Association, 2016). One approach that helps students get active is getting them moving more at school. Schools are an ideal environment for physical activity programs because of the

available space, existing staff structure, and having the physical education teacher as a resource (Langley & Kulinna, 2018). Schools are an optimal place to have physical activity programs because almost all children, regardless of their income, in the United States, go to school, so schools can help lower the gap among actual and recommended levels of physical activity for all children (Schultz et al., 2019).

Comprehensive School Physical Activity Program (CSPAP)

The framework of the CSPAP consists of high-quality physical education, physical activity during the school day, physical activity before and after school, staff involvement, and family and community participation. Offering physical activity programs such as an after-school walking club is beneficial because it gives students the opportunity to be active. An after-school walking club can support students in meeting the recommended daily PA guidelines (U.S. Department of Health and Human Services, 2018). SHAPE America and the American Heart Association (2016) say that "regular physical activity promotes children and adolescents' growth and development while conferring benefits to their physical, mental, and cognitive health" (p. 8). SHAPE America and the American Heart Association (2016) also claim that physically active children have better cardiorespiratory and muscular fitness as well as active lifestyles, and physical fitness helps avoid heart disease, cancer, type 2 diabetes, and osteoporosis among adults. A school walking club can help students and staff members be physically active and increase their overall physical fitness and prevent chronic diseases. When active during work hours, staff members are actively promoting a healthy lifestyle, being positive role models, and creating a positive perspective on being physically active to the students (Langley & Kulinna, 2018). Implementing a walking club at schools offers staff members the ability to be positive role models for their students and engage in a healthy lifestyle. The U.S. Department of Health and Human Services (2018) asserts that physically active and fit children perform better academically short term and long term and exhibit better classroom behavior, have a stronger capability to focus, and have higher rates of school attendance. Thus, there are many reasons

schools should institute an after-school walking club for students and staff members.

There are many recommendations on how to structure a walking club (Schultz et al., 2019), including areas such as safety considerations, club leadership ideas, club size and grade-level participation, club meeting time and duration, location of the club, and physical activity tracking along with goal setting. Key factors for consideration of planning a walking club include having emergency contact information, following a waiver protocol, having at least two adults to lead the club along with administrative support, having a maximum 30 children per adult coach, considering weather conditions, using the program time as a goal to reach the recommended 60 min of daily physical activity, having indoor and outdoor options, using cones or landmarks to form a track, allowing students to track their own miles, and setting goals to help motivate students (Schultz et al., 2019).

The program coordinator must also consider their school's available resources, staff, students, weather conditions, and so forth. Guidelines for constructing a supportive and fun walking club comprise providing choice, playing music, having incentives, using imagery, and creating a positive atmosphere (Schultz et al., 2019). In more detail, reducing competition and more so focusing on team values; tracking total miles for the entire club; offering safe, fun obstacle courses; having walking/running games such as tag, relay races, and line races; letting participants go at their own desired pace; playing motivational music and allowing song requests; providing incentives when goals are met and recognizing effort; and mapping out the club's total mileage as a picture across the state or to a specific place (Schultz et al., 2019). Creating a positive and enjoyable club is essential to maximizing participation and long-term participation. Not only is it a goal to increase students' physical activity levels but also to have students develop and maintain a healthy lifestyle, so it is valuable to make the experience enjoyable. Utilizing these tactics can establish a sense of social connection between the participants, help motivate the participants, and show the significance of self-improvement rather than peer comparison (Schultz et al., 2019). Generating a social connection among staff and students can

develop a positive culture at the school, and self-comparison is an imperative tool to have in life for growth.

Langley and Kulinna (2018) reported strategies for implementing an after-school walking club for staff members. They included six tips for incorporating a walking club program in schools: Gaining administrative support and approval, creating a walking route at the school, having the club at a time available to all staff members, develop a tracking system, promoting the walking club, having incentives (Langley and Kulinna, 2018). Similarly with Schultz et al.'s (2019) recommendations included the use of incentives, creating a lap course, and acquiring administrative support.

Physical Activity Benefits From Before- and After-School Programming

Before- and after-school walking programs provide students and staff a greater chance of reaching the recommended 60 min of moderate-to-vigorous physical activity (MVPA). For example, Stylianou et al. (2016) shows an increase of physical activity to 1,502 steps and 8.30 MVPA minutes, and this accounts for 12.52% of daily step recommendations and 14.17% of the daily MVPA recommendations at a public school. In the same study, but at a K–8 private school, there are similar results, an increased amount of physical activity, 1,731 steps and 10:02 MVPA minutes, and this accounts for 14.43% of daily step recommendations and 16.72% of the daily MVPA recommendations. This is similar to the discovery of Salway et al. (2019), who reported that on days students attend an active after-school club, they increase the average amount of MVPA at school to 7.6 min. Salway et al. suggest that students can raise their time being physically active.

Walking programs at schools improve students' and staff members' energy, mood, and overall stress levels. The Langley and Kulinna (2018) study of staff members at a school shows positive staff perceptions regarding a school walking club, that it increases their energy and mood, and that it helps build rapport with coworkers and students. Haugland et al.'s (2003) research of leisure-time physical activity in adolescent students shows an inverse linear relationship between being physical active and stress. Students who have school-related stress are less likely to report health complaints

if they participate in leisure physical activity at least once a week (Haugland et al., 2003). Pascoe et al.'s (2020) study of stress, anxiety symptoms, and mood states from varying levels of physical activity, from sedentary to light intensity such as yoga or stretching, to moderate intensity such as team sports, cycling, jogging, to moderate-to-vigorous activity such as enhanced physical education classes, strength training, and gymnastics, provides evidence of showed reduced anxiety symptoms (in 16% of students), stress reduction (in 33% of students), and increased state of mood (in 100% of students). These two studies show that physical activity programs can help lower stress levels, anxiety symptoms, and elevate a person's frame of mind.

Before- and after-school walking clubs also contribute to improved classroom behavior among students. Stylianou et al.'s (2016) finding of more on-task on days when students participate in a before-school walking club shows that a before-school walking program leads students to be more focused. Similarly, "Energizer" activities in the classroom for third- and fourth-grade students can improve students' on-task behavior in the classroom (Mahar et al., 2006). From these studies, thus, being active at school can also have behavioral benefits.

Rationale

This study can make an immediate positive change on the students and staff at the school and create optimistic long-term benefits from the learned outcomes of this study. Armstrong et al.'s (2016) research shows that long-term benefits from a walking club include improved cardiovascular endurance, increased bone strength and health, increased physical activity, and lowered stress.

Physical activity plays a key part of academic success in terms of long- and short-term goals. SHAPE America and the American Heart Association (2016) claim that children who are more physically active and fit achieve higher academic accomplishments, are more likely to behave in the classroom, have higher attendance rates, and have a stronger ability to focus and remain on task. An after-school walking program as part of a CSPAP model at a school can have short-term benefits such improved classroom behavior, increased days at school, and better ability to pay attention.

A major theme from the research is that an active before- or after-school program can increase physical activity levels, leading to the accomplishment of 60 min of recommended MVPA. There is also evidence of other benefits from walking/running clubs and actively commuting (walking) to school such as elevating mood, reducing stress levels, creating a positive environment, building relationships among students and staff members, and improving mental and cognitive health. Along with the benefits, the research provides a sufficient amount of suggestions that can be very useful for conducting a walking club. This study on the impact of an after-school walking club on physical activity and stress levels of elementary students and staff members builds on studies of students and staff members to further understand the effect of physical activity on stress levels and mood levels. Such a study is necessary because of the paucity of studies in this area.

Purpose and Research Questions

The purpose of this research was to determine if an after-school walking club for teachers and students would increase physical activity levels, reduce stress, and improve mood. This study asked these research questions:

1. What is the average contribution to daily physical activity from participating in an after-school walking club for teachers and students?
2. Can an 8-week after-school walking class significantly reduce teachers' and students' stress levels?
3. What are participating members' perceptions of this after-school walking program?

Method

Participants and Setting

Human subjects approval was obtained for this study from both Arizona State University and the school. Parents/guardians provided consent, and students provided assent. This school has Grades K–8. According to publicschoolreview.com, at the time of the study, there were approximately 1,040 students. Of those students, 64%

were White, 19% Hispanic, 6% Asian, 4% Black, 7% two or more races, and < 1% other. Twenty percent of the students came from low-income families and 51% were female and 49% male. There were about 60 staff members, and 100% of the full-time teachers were certified and 88% had 3 or more years of teaching experience. At this school, students in grades third through sixth had an opportunity to choose a Physical Education (Momentum) route or Music (Mozart) route. This means if they chose to focus on physical education, they received 4 days of physical education for 45 min and 1 day of music each week, and vice versa for the students who chose the music path. Students could change programs after each quarter or the following year. Students in junior high could choose physical education as an elective, and if they did, they had physical education class every day for 53 min. At this school, they had a half day of school every Wednesday. The curriculum concentrated on a back-to-basics approach with a Saxon Math curriculum and a Spalding Method language arts curriculum. This school also provided free breakfast and lunch for all students and staff.

The participants for this study included staff members ($N = 8$) and fourth- to eighth-grade students ($N = 51$) from a charter school in the Southwestern United States. Of all student participants, 68.6% were White, 13.7% Hispanic, 9.8% Black, 1.9% Asian, and 5.9% other. Males made up 67% of all student participants, whereas 33% were female. In terms of grade levels represented, 51.9% were from the fourth grade, 26.9% from the fifth grade, 11.5% from the sixth grade, 5.8% from the seventh grade, and 3.8% from the eighth grade. Thus, most student participants were from lower grade levels. The control teachers only participated in school day physical activity. The purpose of this was to determine if school day steps were similar across teacher groups. They also completed the Irritation Scale twice. Table 1 shows staff intervention group and control group demographics.

Dependent Variables

The dependent variables included students' and staff members' physical activity levels, stress levels, mood levels, and perceptions regarding the after-school walking program.

Table 1
Staff Intervention and Control Group Demographics

Group	Gender	Ethnicity	Teaching experience
Intervention	100% female	7 Caucasian, 1 Latin American	6 > 5 years' teaching experience
Control	8 females, 1 male	6 Caucasian, 2 Asian, 1 Latin American	8 > 5 years' teaching experience

Research Design

This study used a quasi-experimental research design. Data were collected over 8 weeks from the end of October until Winter break in December 2021. A preassessment was given 1 week prior to the start of the study to both the participants and the control group. The purpose of this was to gain initial knowledge on their current stress levels. Qualitative data were gathered through surveys filled out by participating staff and students. Quantitative data were collected from the pedometers. Twice during the 8-week period, staff members filled out a mood survey prior to the start of the club and then immediately after the club. A postassessment was handed out in person following the completion of the 8-week club. The purpose of this was to determine final stress levels from both staff groups and students and to determine staff members' perceptions of this CSPAP program, the after-school walking club.

Intervention

This study involved an 8-week after-school walking club held twice a week for 45 min. This study compared participants' number of steps during the school day prior to the start of the club to their number of steps after the club. This intervention also compared stress levels before and following the 8-week walking club with the participants.

Data Collection/ Instruments

The data were collected with a variety of instruments. This allowed for a thorough understanding of what was occurring as well

as verification of the information on the dependent variables. The instruments consisted of pedometers to accurately determine number of steps, a quantitative assessment of stress levels, a quantitative assessment of current mood, and a survey regarding overall perceptions of the walking program. Observations with field notes were taken by the researcher each session of the walking club. Staff members took the quantitative assessment of stress levels (i.e., Irritation Scale), the quantitative assessment of current mood (i.e., Positive and Negative Affect Schedule), and a survey regarding overall perceptions of the walking program. Students took the quantitative assessment of stress levels and the survey regarding their perceptions of the walking club.

Pedometers Used by Staff and Students

Students and staff members wore a Yamax Digi Walker pedometer during the school day and after-school walking club to measure physical activity levels. The Yamax Digi Walker pedometer has been shown to produce reliable and valid scores for measuring children's physical activity levels and has been commonly used (Brusseau et al., 2012). Participants had the opportunity to practice wearing and using the pedometer 1 week prior to the study. This ensured their comfortability using and wearing it. Shake tests were done before the study and every 2 weeks to eliminate calibration problems. Total number of steps were recorded every Tuesday and Thursday by the researcher. Extreme outliers were removed (i.e., below 1,000 more the school day).

The Irritation Scale for Staff and Students

The validated Irritation Scale test entails eight Likert-like scale questions on a scale from 1 (*completely disagree*) to 7 (*completely agree*; Merino-Tejedor et al., 2013). This tool was modified for fit with the school atmosphere for students instead of a workplace (e.g., "I have difficulty relaxing after work" was changed to "I have difficulty relaxing after school"). The Irritation Scale has been found to be reliable and valid for use with students and in work-related situations (Merino-Tejedor et al., 2013).

Qualitative Survey for Staff and Students

On the last day, the participating students and staff members filled out a survey with five open-ended questions regarding the

after-school walking club. This allowed for an assessment of the participants' overall thoughts regarding the walking club. Sample items included "What are your thoughts and feelings towards the after-school walking club?" and "Were you in a better mood on days with the walking club (Tuesdays and Thursdays)?"

Mood Survey for Staff

Teachers filled out the Positive and Negative Affect Schedule (PANAS) right before the start of the club and then immediately following the end of the club for that day. For example, participants ranked from 1 to 5 various emotions and feelings such as interested, proud, and upset. This scale has been determined suitable over a 2-month period when used with concise instructions (Watson et al., 1988), and this scale is sensitive to variations in mood. This scale measures positive and negative mood. It has been shown to produce reliable and valid scores with teachers (Watson et al., 1988).

Procedures

The research protocol for this study looked at students' and staffs' physical activity levels on days of the walking club over 8 weeks. Members of the study picked up their pedometer each intervention morning (i.e., Tuesday and Thursday) before school between 7:30 a.m. and 7:50 a.m. in the gym. They wore the pedometer during the school day and turned it into the researcher at the end of the day at 4:00 p.m. The walking club took place on Tuesdays and Thursdays from 3:15 p.m. to 4:00 p.m. This allowed the teachers time to release their students and change if needed. This also provided time for the students to complete their homework and change if needed before the club began. The club took place outside on the field in the back of the school, and the course was outlined with cones. Physical activity levels and number of steps were recorded only on club days on Tuesday and Thursday. Prior to the start of the club, the walking club members took a presurvey (i.e., Irritation Scale) for evaluation of their stress levels. Staff members completed a mood survey prior to the start of the club and immediately after the club twice. Then immediately after the walking club 8-week intervention, all participants took the Irritation Scale and qualitative survey.

Data Analysis

This study consisted of a mixed-methods design. Therefore, multiple methods of data analysis were used in the sythesis of the results.

Investigation of school day physical activity differences on school days with the after-school walking club for teachers, students, and the entire sample was done with *t* tests. These tests were also used in the investigation of pre- to postdifferences in the Irritation Scale, measuring stress for teachers, students, and the entire sample. Further, *t* tests were used in the exploration of pre- and postdifferences for individual mood items for teachers. Data were also graphed for a visual representation.

Descriptive statistics of results showed similarities and differences between the two teacher groups on school day physical activity and the Irritation Scale results (stress measure; Figures 3 and 4).

Themes across open-ended survey responses were determined with common comparison analysis. Trustworthiness measures included member checking (sharing findings with participants for their feedback), search for negative cases, and peer debriefing.

Results

Pedometer

Figure 1 illustrates the accumulation of steps during the school day. Overall, the students' average number of steps during the 13 school days was 7,657 (*SD* = 2,661). Overall, the staff members' average number of steps during the 13 school days was 5,896 (*SD* = 2,617). Figure 2 illustrates the accumulation of steps from the walking club. During the 13 sessions, the mean number of steps for the students participating in the club was 2,585 (*SD* = 699). Over the 13 sessions, the mean number of steps for the staff members participating in the club was 3,063 (*SD* = 331).

Students gathered more steps than the staff members during the school day, but staff members gathered more steps than the students during the after-school club. Figure 2 shows the daily steps in the after-school walking club, and Figure 3 shows similar steps during the school hours across the two teacher groups.

Figure 1

Mean Physical Activity Levels for Students and Staff During the School Days Across Club Day Sessions

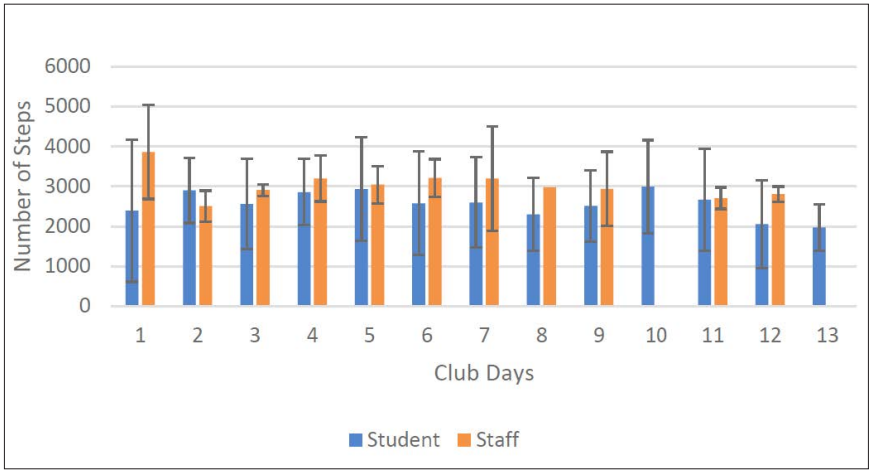
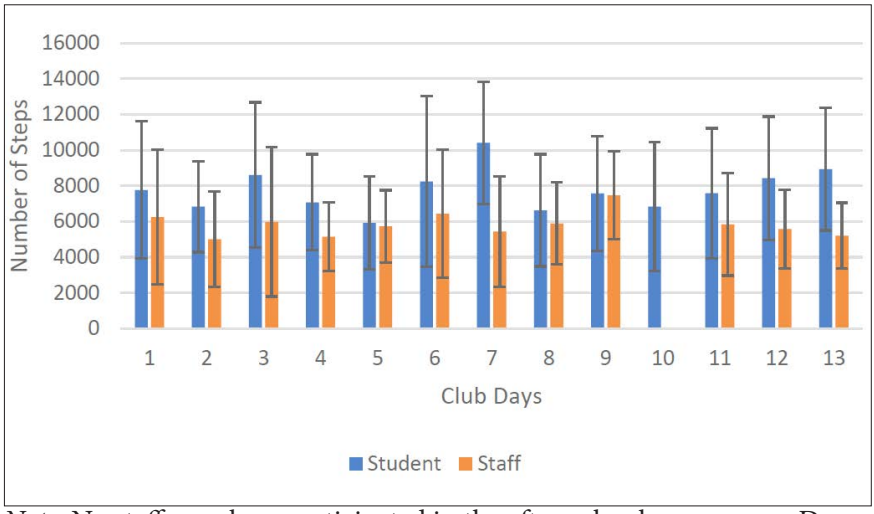


Figure 2

Mean Physical Activity Levels During After-School Walking Club Sessions for Students and Staff Members Across Days



Note. No staff members participated in the after-school program on Day 10 and Day 13.

Figure 3
Mean Physical Activity Levels During the School Day for Staff Members Across Treatment and Control Groups

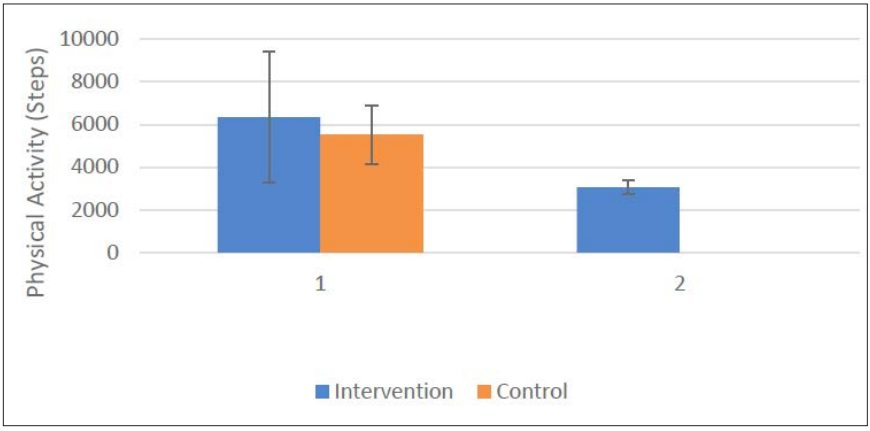
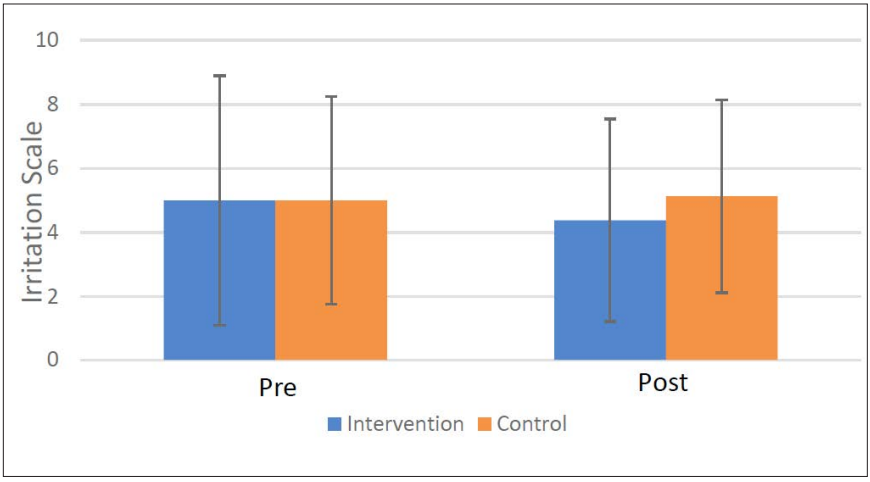


Figure 4
School Staff Members' Mean Irritation Levels Across Intervention and Control Groups



Irritation Scale

The students' mean for the Irritation Scale pretest was 3.13 (*SD* = 1.15) and posttest was 2.47 (*SD* = 1.02). The scale ranged from 1 to 8, suggesting that at the beginning of the project students were more stressed. The intervention staff members' mean for the Irritation Scale pretest was 3.89 (*SD* = .93) and posttest was 3.16

(*SD* = 1.00). These results parallel the students', again suggesting that during the intervention the staff members were less stressed. Across teachers and students, stress significantly decreased across the program, $t(51) = 4.50$, $p < .01$, Cohen's $d = .98$. Although teachers in the intervention group reported significantly lower stress at posttest, their scores were not significantly different from the control group participants' at posttest, $t(15) = 1.47$, $p = .82$. This appears to be related to higher pretest stress for participants ($M = 3.89$, $SD = .93$) than for the control teachers ($M = 3.24$, $SD = 1.41$), making the project even more useful for the teacher participants.

Mood Instrument

The 8-week after-school walking club decreased stress and increased mood. Two *t* tests showed significant improvement in mood from pretest to posttest (Table 2). Three *t* tests showed significant decreases in negative mood from pretest to posttest (Table 2). The overall positive mood mean pre-club was 3.38 (*SD* = .33) and post-club was 3.76 (*SD* = .63), $t(7) = 2.35$, $p = .05$, Cohen's $d = .467$. The overall negative mood mean pre-club was 1.65 (*SD* = .52) and post-club was 1.10 (*SD* =.18), $t(7) = 2.96$, $p = .02$, Cohen's $d = .526$. Table 2 shows 10 positive items and 10 negative items that staff participants ranked on a scale from 1 to 5 pre-club and post-club.

Program Themes About the After-School Program

Twenty-three of the students said they would participate again in an after-school walking club, whereas one said they might and one said they would not. Eighteen students stated they were in a better mood on days with the walking club, two said they were not, two stated they felt the same, and three stated they sometimes did. Most students reported they would change nothing about the after-school walking club program, but a few suggestions included (a) making it on more days, (b) doing more exercising, (c) having all students run a lap before they play a game, and (d) having the students create goals. Of all participating students, 88% indicated they attended the club twice a week and 12% indicated they attended once a week. Major themes the students described as their thoughts and feelings toward the after-school walking club included that they "liked it," "fun," "awesome," "amazing" and a "great way to get exercise after school."

Table 2
Mood of Teachers

Item	Pre-club		Post-club			Cohen's *d*
	M	*SD*	*M*	*SD*	*p*	ES
Positive						
Interested	3.50	.76	4.13	.35	.01*	.518
Excited	3.50	.54	3.88	.99	.35	
Strong	3.63	.52	4.00	.76	.08	
Enthusiastic	3.50	.54	4.00	.93	.10	
Proud	3.75	.71	4.38	.52	.10	
Alert	3.38	.52	3.25	1.04	.79	
Inspired	3.00	.93	3.63	.92	.05*	.744
Determined	3.50	.54	3.75	.89	.52	
Attentive	3.13	.64	3.00	1.07	.73	
Active	2.88	1.13	3.63	1.30	.20	
Negative						
Distressed	2.25	.46	1.38	.74	.00*	.354
Upset	2.25	1.28	1.38	.74	.06	
Guilty	1.00	.00	1.00	.00		
Scared	1.13	.35	1.00	.00	.35	
Hostile	1.25	.46	1.25	.71	1.00	
Irritable	2.88	1.36	1.38	.52	.02*	1.41
Ashamed	1.00	.00	1.00	.00		
Nervous	1.63	.74	1.13	.35	.03*	.535
Jittery	1.88	1.46	1.25	.71	.25	
Afraid	1.25	.46	1.00	.00	.17	

Note. Range is 1 to 5, 5 being the most positive and 1 being the most negative.

The staff members also filled out the five open-ended questions regarding the after-school walking club. All of them reported they would participate again in the walking club. The staff members stated they loved the club, they looked forward to it, it was a great way to decompress, and it motivated them to be active on other days as well. All of the staff members indicated they were in a better mood on days with the walking club, and it was something to look forward to.

The staff members suggestions ranged from (a) making the club all year long, (b) having it separate from students, and (c) having more of a variety of games. One staff member attended the walking club twice a week, whereas all the others attended once a week.

Discussion

More Participation From Younger Participants

There was more participation from younger participants with over half between the ages of 9 and 11, which is similar to the participants in Kahan and McKenzie (2017), in which the majority of participants for their after-school running club were boys between 9 and 11.

The after-school walking program adds an average of 2,650 more steps to students' and staff members' daily physical activity patterns. Given students can accumulate 2,000 steps from a 30-min physical education class (Brusseau et al., 2012), this shows participants in an after-school walking club program can accumulate more steps than in a typical physical education class. Like Salway et al.'s (2019) students who attended an active after-school club increased their MVPA by an average of 7.6 min on the club day, the students in this study increased their daily physical activity time. This also concurs with Schultz et al.'s (2019) statement that walking and running clubs can help students achieve the recommended 60 min of MVPA. Further, results concur with Kahan and McKenzie's (2017) participants who were in the running club for 37 min, 24.2 min on average being physically active, with 50% of this time in MVPA. Students participating in an after-school club increased their daily physical activity time.

Decreased Stress and Increased Mood

This study shows that an 8-week after-school walking club significantly decreases stress and increases mood. This result aligns with findings from Pascoe et al. (2020) that physical activity and exercise have a positive effect on mental health, with 17 out of the 22 studies demonstrating such. It is also similar to the finding of Haugland et al. (2003) that students who participate in leisure-time physical activity have less school-related stress and fewer health complaints.

Limitations and Strengths

This study has a couple of limitations. First, the relatively small sample size of student and staff participants makes generalizations difficult. Second, due to the school's policy regarding COVID-19, students were periodically quarantined and unable to participate in the after-school program. Further examination on the impact of physical activity on mood and stress levels may be warranted. A few strengths from this study are its inclusion of both students and staff members and its examination of stress and mood as well as physical activity levels.

Conclusion and Implications

Participating in an after-school walking club can increase overall daily school-based physical activity. An after-school walking club can also decrease stress levels and improve overall mood, specifically feeling more interested and inspired and feeling less distressed, irritable, and nervous for staff members. An after-school walking club can also decrease stress levels for student participants. This study is important because not only does it explore the daily physical activity patterns of children and adults, but it also looks at stress and mood levels. Understanding of physical activity contributions from an after-school walking club is essential in designing effective physical activity interventions. The school day and more specifically an active after-school walking club appear to be extremely important for increasing physical activity levels, decreasing stress, and improving overall mood. This provides valuable new information as well as baselines measures for practitioner and researchers to use in school-based physical activity interventions.

References

Armstrong, T., Hong-Min, L., & Napper-Owen, G. (2016). Developing a before-school physical activity class: Start with a power-walking program. *Journal of Physical Education, Recreation, & Dance, 87*(9), 42–47. https://doi.org/10.1080/07303084.2016.1226219

Brusseau, T., Kulinna, P. H., Tudor-Locke, C., & Ferry, M. (2012). Daily physical activity patterns of children living in an American Indian community. *Journal of Physical Activity and Health*, *10*(1), 48–53. https://doi.org/10.1123/jpah.10.1.48

Haugland, S., Wold, B., & Torsheim, T. (2003). Relieving the pressure? The role of physical activity in the relationship between school-related stress and adolescent health complaints. *Research Quarterly for Exercise and Sport*, *74*(2), 127–135, https://doi.org/10.1080/02701367.2003.10609074

Kahan, D., & McKenzie, T. L. (2017). Physical activity and energy expenditure during an after-school running club: Laps versus game play. *Journal of School Health, 88*(3), 237–245.

Langley, K., & Kulinna, P. (2018). Developing a staff physical activity program at your school: Implementing the lesser-used component of the CSPAP model. *Journal of Physical Education, Recreation, & Dance, 89*(2), 49–55. https://doi.org/10.1080/07303084.2017.1404509

Mahar, M. T., Murphy, S. K., Rowe, D. A., Golden, J., Shields, T., & Raedeke, T. D. (2006). Effects of a classroom-based physical activity program on physical activity and on on-task behavior in elementary school children. *Medicine & Science in Sports & Exercise*, *38*(Suppl.), S80. https://doi.org/10.1249/00005768-200605001-01239

Merino-Tejedor, E., Boada-Grau, J., Sánchez-García, J. C., & Hontangas-Beltrán, P. M. (2013). The Irritation Scale as an instrument to measure stress among university students. *The Spanish Journal of Psychology*, *16*, 1–3. https://doi.org/10.1017/sjp.2013.106

Pascoe, M., Bailey, A. P., Craike, M., Carter, T., Patten, R., Stepto, N., & Parker, A. (2020). Physical activity and exercise in youth mental health promotion: A scoping review. *BMJ Open Sport & Exercise Medicine*, *6*(1), Article e000677. https://doi.org/10.1136/bmjsem-2019-000677

Salway, R., Emm-Collison, L., Sebire, S. J., Thompson, J. L., Lawlor, D. A., & Jago, R. (2019). The association of school-related active travel and active after-school clubs with children's physical activity: A cross-sectional study in 11-year-old UK children. *International Journal of Behavioral Nutrition and Physical Activity*, *16*(1), 1–1. https://doi.org/10.1186/s12966-019-0832-3

Schultz, D., Hatfield, D., & Economos, C. (2019) Implementing successful school run clubs: Lessons learned from a district-level initiative in Boston public schools. *Journal of Physical Education, Recreation, & Dance*, *90*(2), 31–42. https://doi.org/10.1080/07303084.2018.1546631

Shape America & the American Heart Association. (2016). *Shape of the nation: Status of physical education in the USA*. https://www.shapeamerica.org/Common/Uploaded%20files/uploads/pdfs/son/Shape-of-the-Nation-2016_web.pdf

Stylianou, M., Kulinna, P. H., van der Mars, H., Mahar, M. T., Adams, M. A., & Amazeen, E. (2016). Before-school running/walking club: Effects on student on-task behavior. *Preventive Medicine Reports*, *3*, 196–202. https://doi.org/10.1016/j.pmedr.2016.01.010

U.S. Department of Health and Human Services. (2018). *Physical activity guidelines for Americans* (2nd ed.). https://health.gov/paguidelines/second-edition/pdf/Physical_Activity_Guidelines_2nd_edition.pdf

Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, *54*(6), 1063–1070. https://doi.org/10.1037/0022-3514.54.6.1063