FITNESS

Healthy Living Initiative: Running/Walking Club

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Abstract

This study was grounded in the public health literature and the call for schools to serve as physical activity intervention sites. Its purpose was twofold: (a) to examine the daily distance covered by students in a before-school running/walking club throughout 1 school year and (b) to gain insights on the teachers' perspectives of the club. Participants were students (N = 251) and teachers (N = 24) from an elementary school in one American Indian community in the southwestern United States. Physical activity (i.e., distance) data were collected over 4 weeks throughout the school year, and formal, semistructured interviews were conducted with a subsample of the teachers (n = 15). Physical activity data were analyzed using descriptive statistics, repeated measures ANOVAs, one-way ANOVAs, and independent t tests. Interview data were analyzed using inductive analysis and constant comparison. Findings indicated that students covered between 0.6 and 1.0 mile per day during the running/walking club. Also, findings indicated a significant increase in the average daily distance students covered over time as well as grade level and gender differences. Two themes emerged from the interview data: (a) teachers had positive perceptions of the running/walking club, and (b) teachers perceived themselves as

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positive physical activity role models for the students. The findings of this study point out that a before-school running/walking club can significantly contribute to students' daily physical activity and that teachers have the potential to contribute to students' physical activity and wellness outside of the classroom.

Childhood obesity constitutes one of the most serious public health concerns in the United States. According to National Health and Nutrition Examination survey (NHANES) data, between 1976–1980 and 2007–2008, the prevalence of BMI-for-age at or above the 95th percentile (i.e., obesity category; Barlow & The Expert Committee, 2007) has tripled among school-aged children and adolescents (Ogden & Carroll, 2010). In 2009–2010, also according to NHANES data, 16.9% of American children and adolescents aged 2 to 19 years were obese (Ogden, Carroll, Kit, & Flegal, 2012).

Obesity is associated with various adverse health outcomes. Although a comprehensive review of the consequences of childhood obesity is beyond the scope of this paper, in short, obese children and adolescents are more likely to develop various cardiovascular (e.g., hypertension, left ventricular hypertrophy, atherosclerosis), metabolic (e.g., insulin resistance, dyslipidemia, metabolic syndrome, type 2 diabetes), and other (e.g., pulmonary, psychological) disorders (Daniels, 2006; Daniels et al., 2005). Furthermore, obese children are at a greater risk of becoming obese adults, which, again, is associated with various negative health conditions, including cardiovascular disease, diabetes, and some cancers (Daniels, 2006).

The prevalence of childhood obesity is greater in minority populations, with indigenous children being the population most at risk. Anderson and Whitaker (2009) found that 4-year-old American Indian (AI)/Native Alaskan children had the highest obesity prevalence (i.e., BMI > 95th percentile for age) among all U.S. ethnic groups (boys, 37%; girls, 25.8%), which was about double the obesity prevalence in non-Hispanic white or Asian children and significantly higher than the obesity prevalence in non-Hispanic black and Hispanic children. Similarly, in a study with 7- and 8-year-old children from 41 elementary schools in seven AI communities, Caballero et al. (2003) found that 26.8% of boys and 30.5% of girls were above the 95th percentiles of BMI for age, percentages which were significantly higher than the 1999–2000 NHANES averages for children of all races and of similar ages (ages 6 to 11: boys,

16%; girls, 14.5%; Ogden, Flegal, Carroll, & Johnson, 2002). Furthermore, Zephier, Himes, and Story (1999) reported that the age-adjusted obesity prevalence (i.e., BMI > 95th percentile) in AI school children and adolescents aged 5 to 17 (males, 22%; females, 18%) was significantly greater than that expected from the reference data (5%).

Although several studies suggest that genetic factors influence propensity toward obesity, behavioral and lifestyle conditions related to diet and physical activity (PA) play a critical role in the manifestation of obesity in AI populations. Obesity has only become a major health problem in AI populations in the past few generations and is considered to be associated with a relative abundance of high-fat foods and rapid changes from active to sedentary lifestyles (Halpern, 2007; Story et al., 1999). These changes are, in turn, associated with industrialization and the abandonment of traditional occupations (i.e., hunting, gathering, and farming; Halpern, 2007).

Participation in regular PA is a key component of preventing and combating obesity and the associated adverse health outcomes (Daniels et al., 2005). Several studies that targeted AI populations found that PA is associated with a lower risk and lower incidence of type 2 diabetes (e.g., Fretts et al., 2009; Kriska et al., 2003), which is a major health concern for AI youth that is associated with their increasing weight (e.g., Moore, Harwell, McDowall, Helgerson, & Gohdes, 2003; Pavkov et al., 2007; The Writing Group for the SEARCH for Diabetes in Youth Study Group, 2007). Clearly, a need exists to develop PA programs targeting AI youth to prevent and combat obesity and diabetes.

Physical Activity of American Indian Children

Information regarding the PA patterns of AI children and adolescents is scarce. Specifically, we could only identify four studies that focused on the PA levels of AI youth. One of these studies employed self-report questionnaires (Fontvieille, Kriska, & Ravussin, 1993), and the other three used pedometry (Brusseau et al., 2012; Brusseau, Kulinna, Tudor-Locke, & Ferry, 2013; Johnson, Kulinna, Darst, & Pangrazi, 2007).

Fontvieille et al. (1993) compared the sport leisure PA patterns of Pima and Caucasian children using questionnaires completed by both the children and a parent during interviews. The children's data indicated that (a) Pima girls had significantly lower past-year sport leisure activity (1 median hr/week) than Caucasian girls (5.6 median

hr/week) and that (b) Pima boys and girls had significantly lower past-week sport leisure activity (boys, 2 median hr/week; girls, 1 median hr/week) than Caucasian boys (4 median hr/week) and girls (2.5 median hr/week). Similarly, the parent data showed that Pima children had significantly lower PA levels over the past year (boys and girls, 3 median hr/week) than their Caucasian counterparts (boys, 6 median hr/week; girls, 3 median hr/week).

Johnson et al. (2007), who employed pedometry to examine the PA levels of Pima children (aged 8 to 12) from two AI communities during the school day, found that boys accumulated a mean of 4,237 steps (*SD* = 2,122) and 53:36 min of PA (*SD* = 24:16) per school day and that girls accumulated a mean of 4,042 steps (*SD* = 1,628) and 50:55 min of PA (*SD* = 18:41) per school day. However, they did not find statistically significant gender differences. Similarly, Brusseau et al. (2012) found that third to sixth grade AI boys and girls accumulated 4,762 (*SD* = 1,544) and 4,408 (*SD* = 1,194) steps per school day across the four seasons, respectively, with statistically significant gender differences observed only for the summer. Finally, Brusseau et al. (2013), who also employed pedometry to describe fifth and sixth grade AI children's PA, found that boys accumulated 12,621 (*SD* = 5,385) steps per weekday and girls accumulated 11,640 (*SD* = 3,695) steps per weekday, of which 4,779 (*SD* = 1,271) and 4,027 (*SD* = 1,285) were accumulated at school for boys and girls, respectively. Statistically significant gender differences were evident for the steps taken during the school day but not for the steps accumulated on weekdays.

The daily step recommendation for children is 12,000 steps per day, regardless of gender (Colley, Janssen, & Tremblay, 2012). Based on Brusseau et al.'s (2013) study results, which is the only study that collected daily (i.e., 24 hour) PA data, AI children overall meet this recommendation. Relative to non-AI female U.S. populations of similar age (10,479–12,332 steps/weekday; Brusseau et al., 2011; Tudor-Locke, Lee, Morgan, Beighle, & Pangrazi, 2006; Vincent & Pangrazi, 2002), the AI girls in Brusseau et al.'s (2013) study accumulated a comparable number of steps per weekday (11,640 ± 3,091). The boys, however, accumulated fewer steps per weekday (12,624 ± 4,362) than non-AI male U.S. populations of similar age (13,082–16,421; Brusseau et al., 2011; Tudor-Locke et al., 2006; Vincent & Pangrazi, 2002). Both boys and girls accumulated fewer steps per weekday than most of their international counterparts (see

review studies by Beets, Bornstein, Beighle, Cardinal, & Morgan, 2010; Tudor-Locke, McClain, Hart, Sisson, & Washington, 2009).

Although recommendations are not available for steps per school day, the relevant results described can be compared to the results of other studies that collected similar data for non-AI youth within the United States and internationally. The in-school PA levels of AI boys and girls (boys, 4,237–4,779 steps; girls, 4,027–4,408 steps; Brusseau et al., 2012; Brusseau et al. (2013); Johnson et al., 2007) are higher, comparable, or lower than the in-school PA levels of non-AI U.S. children of similar ages (boys, 3,800–6,832 steps; girls, 2,956–4,895 steps; Beighle, Erwin, Morgan, & Alderman, 2012; Brusseau et al., 2011; Morgan, Pangrazi, & Beighle, 2003; Tudor-Locke et al., 2006), and they are lower than the respective PA levels of international children (boys, 6,779–7,594 steps; girls, 4,895–6,070 steps; Tudor-Locke et al., 2009).

Role of Schools: Comprehensive PA Programs

Schools have been identified as primary intervention sites for targeting inactivity and childhood obesity (e.g., Pate et al., 2006) because the vast majority of children attend school and spend the biggest part of their day at school. Traditionally, physical education (PE) has been the primary source of PA in the school. However, the No Child Left Behind Act and the emphasis on improving standardized test scores has forced school districts around the United States to limit the time and resources allocated to PE in favor of core academic subjects, thus diminishing opportunities for participation in PA throughout the school day (Center on Education Policy, 2007; Hardman, 2007). Also, no federal law requires PE to be provided to students in American schools, and at the same time, state mandates regarding PE are broad and general (National Association for Sport and Physical Education [NASPE] and American Heart Association [AHA], 2012). For example, although the majority of states mandate PE, "most do not require a specific amount of instructional time and more than half allow exemptions, waivers, and/or substitutions" (NASPE & AHA, 2012, p. 7). PA recommendations for children and adolescents clearly cannot be met through PE alone.

Therefore, to attack the obesity epidemic and help children accumulate the recommended amounts of daily PA and improve their health, a number of initiatives have evolved over the last few decades in the United States that target health and/or PA in the school setting. These initiatives include (a) First Lady Michelle

Obama's Let's Move! campaign, (b) the 2004 Child Nutrition and WIC Reauthorization Act (PL 108-265), (c) the FIT Kids Act (H.R.1057/S.576), (d) NASPE's Comprehensive School Physical Activity Programs (i.e., Let's Move in School), (e) the Active and Healthy Schools program, (f) the Coordinated School Health Programs by the Centers for Disease Control and Prevention (CDC), and (g) the Healthy Zone School Recognition Program by The Cooper Institute and the United Way of Metropolitan Dallas.

The aforementioned programs aim to make school environments more healthy and active and involve multiple components, including (a) quality PE, (b) recess, (c) before-school and after-school programs, (d) classroom PA breaks, (e) lunchtime activity, (f) active commuting to and from school, and (g) community events. The purpose of these programs is not only to help students meet the daily PA guidelines but also to promote healthy and active lifestyles. Moreover, many experts agree that PE should be the cornerstone of any comprehensive PA program and that PE teachers should be trained to serve as school directors of PA (Beighle, Castelli, Erwin, & Ernst, 2009; NASPE, 2008).

Running/Walking Clubs

Running/walking clubs constitute one example of a component of a comprehensive school PA program. Walking and running represent lifetime physical activities and generate important health (e.g., weight management, improved cardiovascular fitness, reduction of risk of obesity, heart disease, diabetes), psychological, and other benefits (e.g., Sachs & Buffone, 1997). According to Ratliffe and Bostick (2001), the purpose of running/walking clubs is "to help children improve their ability to sustain continuous running and walking, identify walking and running as beneficial cardiorespiratory exercise, and participate in daily walking and running outside of regularly scheduled physical education class" (p. 24). However, we could only identify a few studies that focused on running/walking clubs, and they were all conducted in the United States.

Ratliffe and Bostick (2001) reported that in an elementary school in Florida, half a year after having been introduced to the "Grizzlies World Class Run/Walk Clubs," over 100 students (about 20% of enrollment) became members of the various running/walking Mile Clubs and ran and walked at recess and at home to attain their mile goals. According to Ratliffe and Bostick, additional positive

outcomes related to the running/walking clubs were (a) participation of teachers and staff (e.g., teachers took their classes around the trail for an afternoon exercise break), (b) integration of club data with classroom work (i.e., math), (c) family involvement (e.g., parents walked and ran with their children), and (d) community involvement (e.g., local businesses provided special awards, the local newspaper described the clubs in the sports columns). One of the most important outcomes, however, was that students with disabilities, students who were less athletically inclined, and students who were overweight participated in the clubs and achieved the awards. Finally, students of the particular school started participating at children and adolescents' running events around town.

Foshay and Patterson (2010) found that although 1 day of running practice per week (during PE) for 6 weeks improved the mile run performance of fourth grade students in the control group (pretest = 13.90, posttest = 12.62; minutes and seconds were transformed in decimals), 4 days of running practice per week (1 day during PE, 3 days during recess running club) resulted in more significant improvement in the mile run performance for the experimental group students (pretest = 13.84, posttest = 11.60). However, the results of the study indicated that 6 weeks of running club practice during recess, in addition to running in PE class, was insufficient for the majority of students to achieve state standards for the mile run (i.e., 8-year-old girls = 11:15 min, 8-year-old boys =10:10 min, 9-year-old girls = 11:00 min, 9-year-old boys = 9:45 min).

Finally, Xiang, McBride, and Bruene (2004, 2006) and Xiang, McBride, Bruene, and Liu (2007) conducted a series of studies on students' motivation (i.e., using achievement goal theory and the expectancy-value model of achievement choice) in elementary PE running programs designed to promote cardiovascular health, active lifestyles, mastery behaviors (e.g., persistence and effort), and goal setting. The results of these studies indicated that (a) fourth grade students improved their mile run performance but became less motivated about running (Xiang et al., 2006); (b) fourth grade students' beliefs about how good they were in the running program (i.e., expectancy beliefs) and their perceptions of how interesting and fun it was (i.e., interest) were the strongest positive predictors of their persistence/effort, mile run performance, and intention for future participation in running (Xiang et al., 2004, 2006); and (c) fifth grade students in the high-task–low-ego and high-task–high-ego groups demonstrated more positive motivational outcomes than

students in the low-task–low-ego and low-task–high-ego groups (i.e., tended to report higher scores on expectancy beliefs; considered running in PE more important, interesting, and useful; displayed a stronger intention for future participation in running; and performed better on the mile run; Xiang et al., 2007).

Purpose

The studies described above focused on several outcomes (e.g., motivational outcomes, mile run performance) related to running/walking clubs, which were offered mainly through PE and recess. The current study was designed to provide one AI elementary school with opportunities to increase students' participation in PA at school through a before-school running/walking club and had a twofold purpose: (a) to examine the daily distance covered by students in the club throughout 1 school year and (b) to gain insights on the teachers' perspectives of the club. This study extends earlier work with running/walking clubs in several ways. First, the running/walking club was offered as a before-school program and constituted a component of a long-term intervention project aimed at developing healthy and active schools. Second, no other studies could be found involving running/walking clubs in AI populations. Third, this study is, to our knowledge, the first study that provides data related to students' PA throughout a running/walking club. Last, in this study, teachers were also active participants in the running/walking club.

Methods

Running/Walking Club: Context and Procedures

The running/walking club was part of a 3-year healthy living intervention project, which aimed to develop healthy and active schools in one AI community through increased PA participation, high-quality PE programming, and teaching and practicing of healthy living knowledge and behaviors. Specifically, the project included (a) professional development for PE teachers, (b) professional development for classroom teachers and other school personnel related to implementing classroom PA breaks and teaching basic PA and food pyramid content, (c) before- and after-school programs, (d) external and peer mentor teacher support and curricular support, (e) improvement of food service, and (f) regular family events that involved healthy food and PA experiences. The running/walking club had been in place at the school all 3 years of the healthy living

project, but running/walking club data were only collected in the third year (2009–2010 school year).

The purpose of the running/walking club was to help students meet recommended daily PA guidelines (60 min of moderate to vigorous PA; U.S. Department of Health and Human Services [USDHHS], 2008), improve their cardiovascular fitness, and promote lifetime activity habits. The club occurred for 10 to 20 min before school every day, except on days with inclement weather. During that period of time, students were encouraged to walk or run and do their best in the available amount of time. Teachers took their classes out for the running/walking club once 90% of the students were present (usually when the school buses arrived at the school). Since the school had made a conscious decision not to use a bell system, the time allotted for the running/walking club ranged from 10 to 20 min. As required by the principal, all teachers walked or ran with their students every day, except on data collection weeks.

Participants

Participants for this study were students and their teachers at one AI elementary (K–6) school in the southwestern United States. Among the students who provided consent and assent for participating in this project ($N = 251$), 53.8% ($n = 135$) were males and 46.2% ($n = 116$) were females. The vast majority of the students ($n = 247$, 98.4%) identified themselves as having an AI ethnic background. A more detailed description of student demographics by grade level is provided in Table 1.

Table 1

Student Demographics

Grade	*N*	Sex		Ethnicity	
		Male	Female	American Indian	Other
Kindergarten	65	38	27	64	1
1st Grade	56	30	26	56	0
2nd Grade	38	20	18	36	2
3rd Grade	33	21	12	33	0
4th Grade	26	9	17	26	0
5th Grade	18	8	10	18	0
6th Grade	15	9	6	14	1
	251	135	116	247	4

Among the teachers of the school ($N = 24$), 20 were female and four were male. Teachers identified their ethnic backgrounds as AI ($n = 11$), Caucasian ($n = 10$), Hispanic ($n = 1$), and Asian American ($n = 2$). Two of the teachers (one third grade teacher, female, AI; one fifth grade teacher, male, Caucasian) chose not to participate in data collection with their classes, although they did participate in the running/walking club throughout the year.

Prior to data collection, approval was obtained from the university institutional review board, the educational board of the tribal community's council, and the school's principal. Teacher consent, parental consent, and student assent forms were also collected.

Data collection

PA/distance. For this project, data were collected regarding the laps/distance students covered in the running/walking club per day. Data were collected over 4 weeks throughout the school year (September 14–18; November 16–20; February 1–5; March 29–April 2). During those weeks, teachers counted the laps their students walked or ran rather than participating with them. Throughout the school year, particularly during data collections weeks, members of the research team spent extensive amounts of time observing the running/walking club.

Interviews. Throughout the academic year, members of the research team conducted formal interviews with a subsample of the teachers ($n = 15$; female = 11, male = 4; AI = 8, Caucasian = 5, Asian American = 2) regarding the healthy living project and its various components. The specific subsample of teachers was selected based on availability and willingness to participate in the interviews. The interviews were conducted during the school day at the convenience of the teachers and lasted between 45 and 60 min. A semistructured interview guide was used for conducting the interviews; relatively broad questions were prepared on the general interview guide, thus allowing for flexibility to probe for details or discuss issues that emerged during the interviews. Sample questions included the following: (a) Can you provide examples of changes that have made this a better environment for student wellness?, (b) Can you provide examples of factors that impeded this wellness initiative?, (c) Why did you choose to participate in this project?, and (d) What was your role in this change project? More specific questions were as follows: (a) What do you think of the running/walking club and its role in the health initiative? and (b) What was your role in the running/walking

club? Members of the research team recorded and transcribed the interviews. For this study, data were gathered that addressed the running/walking club only.

Data Analysis

PA/distance data. During the data analysis process, members of the research team converted the laps students covered in the running/walking club into miles. Specifically, six laps were equal to 1 mile, and therefore, the laps that students ran/walked were divided by 6 to obtain the distance they covered in miles (e.g., if a student ran/walked 4.5 laps, she or he would have covered .75 miles). Subsequently, the distance each student ran/walked was also averaged across the four data collection periods.

Descriptive statistics (i.e., means and standard deviations) were calculated for the daily distance students covered during each data collection week. Additionally, repeated measures ANOVA analyses with Bonferroni post hoc tests were conducted to determine whether the average daily distance of students of each grade level, as well as of all students regardless of grade level, significantly increased between successive data collection periods and throughout the year. Furthermore, one-way ANOVA analyses with Games-Howell post hoc tests (due to the violation of the homogeneity of variance assumption) were conducted to examine potential grade level differences in the average daily distance students covered (a) during each data collection period and (b) across the four data collection periods. Finally, independent *t*-test analyses were conducted to examine potential gender differences in the average daily distance of students of each grade level, as well as of all students regardless of grade level, (a) for each data collection period and (b) across the four data collection periods.

Interview data. Constant comparison and analytic induction techniques (LeCompte & Preissle, 1993) were used to identify and extract common themes related to the running/walking club throughout the interview data. During this process, two researchers worked independently to code the data and develop a list of initial themes with supporting data. Next, those initial themes were discussed, reviewed, and compared to the data. Themes specific to individual or small groups of teachers were eliminated and the discussions focused on themes that cut across a majority of the interviewees.

Trustworthiness of Interview Data

Multiple techniques were used to ensure the trustworthiness of the interview data. First, a second expert from the field of PE served as a peer reviewer; that is, he or she independently reviewed the data and negotiated themes with the primary investigator. Second, member checks were conducted. Specifically, all interviewees were sent a draft of the themes that emerged from the interviews and were asked to reflect on it and submit comments indicating whether they thought those themes reflected their views on the topics discussed. As a result of this process, a few minor comments were received that provided support to the themes. Last, multiple searches for negative cases were conducted; that is, the two reviewers independently reviewed the interview data searching for cases that disconfirmed the emergent themes.

Results

Distance/Mileage

The results of the daily average distance of students of each grade level in the running/walking club during each data collection week are presented in Figure 1. Overall, students ran/walked between 0.6 and 1.0 mile per day during each of the data collection weeks.

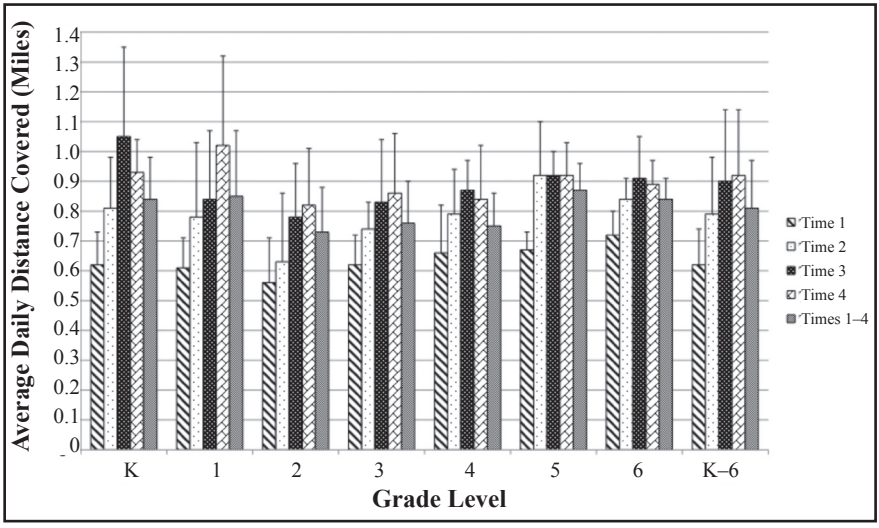

Figure 1. Average daily distance covered during each of the four data collection weeks and across the four data collection weeks (means and standard deviations).

Time differences. Repeated measures ANOVA results indicated that the average daily distance of students of each grade level significantly increased between successive collection periods and/or throughout the year (see Table 2). A significant increase throughout the year was also found for the daily average distance of all students regardless of grade level.

Grade level differences. One-way ANOVA results indicated grade level differences in terms of the daily average distance covered (see Table 3). Table 3 shows that fifth and sixth grade students covered significantly longer distances than younger students during some of the data collection periods and across the four data collection periods. At the same time, kindergarten students covered significantly longer distances than older students during the third data collection period and across the four data collection periods.

Gender differences. The results of the independent *t* tests conducted by grade level revealed a significant gender difference only for kindergarten students. Specifically, kindergarten boys covered longer average daily distances than kindergarten girls during the second data collection period, $t(54) = 3.24$, $p < .01$; mean difference = .14 miles, and across the four data collection periods, $t(63) = 2.28$, $p = .026$, mean difference = .08 miles. Similarly, the results of the independent *t* tests conducted with all students regardless of grade level revealed that male students covered significantly longer daily average distances than female students during the third data collection period, $t(227) = 2.09$, $p = .038$, mean difference = .07 miles, and across the four data collection periods, $t(246) = 2.41$, $p = .017$, mean difference = .05 miles.

Interviews

From the interview data, two themes emerged related to the running/walking club: (a) positive teacher perceptions and (b) teachers as positive PA role models.

Positive teacher perceptions. The first theme identified was that teachers valued the running/walking club and considered it an important part of the healthy living project. Although teachers gave different reasons for this, the most significant of these reasons related to their awareness of the negative health trends (i.e., obesity, diabetes) of the student population at their school, which often served as motivation for them to participate in the club.

Table 2

Physical Activity (Distance) Differences Over Time by Grade Level

Repeated Measures Test Results						Significant Bonferroni Post Hoc Test Results					
Grade	***df* Numerator**	***df* Denominator**	***F* value**	**Sig.**	**Partial Eta Squared**	**Data Collection Period Comparison**	**Mean Difference**	**Std. Error**	**Sig.**	**95% CI**	
										Lower Bound	**Upper Bound**
K	1.84*	46.01*	30.09	< .001	.55	T1–T2	-.20	.03	< .001	-.28	-.12
						T1–T3	-.39	.05	< .001	-.53	-.25
						T1–T4	-.33	.03	< .001	-.42	-.24
						T2–T3	-.20	.06	.014	-.36	-.03
						T2–T4	-.13	.04	< .010	-.24	-.03
1	1.97*	47.26*	30.52	< .001	.56	T1–T2	-.13	.04	.032	-.26	-.01
						T1–T3	-.19	.03	< .001	-.28	-.10
						T1–T4	-.44	.06	< .001	-.62	-.27
						T2–T4	-.31	.05	< .001	-.45	-.17
						T3–T4	-.26	.06	< .010	-.43	-.09
2	3.00	27.00	3.33	.034	.27	T1–T3	-.18	.05	.032	-.35	-.01
3	1.20*	11.95*	5.73	.030	.36	T1–T2	-.18	.02	< .001	-.26	-.11
						T1–T3	-.25	.08	.049	-.50	-.001
						T1–T4	-.30	.07	< .010	-.52	-.07
4	3.00	21.00	7.31	< .010	.51	T1–T2	-.27	.05	< .010	-.46	-.08
						T1–T3	-.24	.05	.011	-.42	-.06

Table 2 (cont.)

Repeated Measures Test Results						Significant Bonferroni Post Hoc Test Results					
Grade	*df* Numerator	*df* Denominator	*F* value	Sig.	Partial Eta Squared	Data Collection Period Comparison	Mean Difference	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
5	3.00	30.00	15.25	< .001	.60	T1–T2	-.25	.06	< .010	-.43	-.06
						T1–T3	-.25	.03	< .001	-.34	-.15
						T1–T4	-.25	.04	< .010	-.39	-.12
6	1.49*	17.85*	15.29	< .001	.56	T1–T2	-.12	.02	< .001	-.18	-.07
						T1–T3	-.20	.05	< .010	-.34	-.06
						T1–T4	-.17	.03	< .001	-.25	-.09
K–6	2.37*	244.15*	71.67	< .001	.41	T1–T2	-.17	.02	< .001	-.21	-.13
						T1–T3	-.26	.02	< .001	-.31	-.20
						T1–T4	-.30	.02	< .001	-.36	-.24
						T2–T3	-.09	.02	< .010	-.14	-.03
						T2–T4	-.13	.02	< .001	-.18	-.07

Note. CI = confidence interval.

*The Greenhouse-Geisser correction is used because the sphericity assumption was violated (Mauchly's sphericity test, $p < .05$).

Table 3

Grade Level Physical Activity (Distance) Differences

ANOVA Test Results					Significant Games-Howell Post Hoc Test Results					
Data Collection Period	*df* Numerator	*df* Denominator	*F* value	Sig.	Grade Level Comparison	Mean Difference	Std. Error	Sig.	95% CI Lower Bound	95% CI Upper Bound
T1	6	61.86	4.45	< .01	K–6	-.10	.03	.021	-.19	-.01
					1–6	-.10	.03	.027	-.20	-.01
					2–5	-.11	.03	.020	-.20	-.01
					2–6	-.16	.03	< .010	-.26	-.05
					3–6	-.10	.03	.038	-.19	-.003
T2	6	47.82	4.39	< .01	3–6	-.10	.03	< .010	-.18	-.02
T3	6	70.33	6.27	< .001	K–1	.21	.05	< .010	.06	.36
					K–2	.27	.05	< .001	.13	.41
					K–3	.21	.05	< .010	.05	.37
					K–4	.17	.05	< .010	.03	.32
					K–5	.13	.04	.041	.003	.26
					2–5	-.14	.03	< .010	-.24	-.03
T4	6	43.50	2.89	.019	1–2	.20	.05	< .010	.04	.35
T1–T4	6	83.03	6.49	< .001	K–2	.12	.03	< .010	.03	.21
					K–4	.09	.03	.038	.003	.18
					1–2	.12	.04	.024	.01	.24
					2–5	-.15	.03	< .001	-.25	-.05
					2–6	-.12	.03	< .010	-.21	-.02
					3–5	-.11	.03	.020	-.21	-.01
					4–5	-.12	.03	< .010	-.22	-.03

Note. The Welch Robust Test results are reported for the ANOVA tests due to the fact that the homogeneity of variance assumption was violated (Levene statistic, $p < .05$). Likewise, the Games-Howell post hoc test results are reported due to unequal group variances. T1–T4 is the average daily distance students covered across the four data collection periods.

Ms. Davis (Caucasian) pointed out that the students at their school "have the highest rates of obesity and diabetes [in the United States]" and "anything that can help with that is great." Similarly, Mr. Morris (AI) acknowledged that the teachers at the school realized that they had "…to help these children get moving for the future" and that the running/walking club was "…a good way to do that." Ms. Roberts (AI) indicated that teachers recognized and wanted to contribute to the community's effort to address the health disparities of their people:

> That [the running/walking club] was one part of how they [the tribes] wanted to address the diabetes problem here on this reservation...This program [running/walking club] just complemented everything that the tribes wanted to instill in their community. That's my job to help them meet that goal. That's why I'm looking at the bigger picture. That's why it was important to me, too.

Some teachers specifically commented on the opportunities for additional PA the club provided to the students. Ms. Johnson (Caucasian) shared,

> There are more kids moving and I think things like the running club help…I mean they're kids. You give them something to do, they're going to probably choose to do it rather than do nothing for the most part.

Similarly, several teachers pointed out the club's potential to stimulate lifelong PA. They said, "… it helps make it [running] a habit…" (Ms. Hall, AI) and "…it puts it [running] in their daily life and hopefully they'll keep it in the future…" (Ms. Miller, Caucasian)

Teachers as positive physical activity role models. The second theme related to teachers' perception that their own participation in the running/walking club positively impacted students' participation. Ms. Hall (AI) noted, "It's just healthier when you have an adult participating right along with them and not being the iron hand saying, 'You've got to do this, you have to do this, it's mandatory.'" The following quotes represent common teacher responses on this issue:

> Personally speaking, what I'm learning, even in my own life and through my own life, that leading by example is very

> important and when students are being forced to or told to like the walks that they have every morning, it's not fun, but if you can get everybody involved instead of being stationed here and there and demonstrate what they're talking about instead of do as I say and don't do as I do. That doesn't help; it angers the children. (Mr. Morris, AI)

> I think what I've noticed is that the more the kids see that we're doing stuff, when they see Ms. Harris [the assistant principal] out there running or us teachers going out and we walk with the kids in the running club, I think that helps because then they don't feel like it's just something we ask them to do, but we don't want to do it. (Ms. Lewis, Caucasian)

The teachers thought that their participation made the running/walking club more fun and encouraged students to do better. The next two quotes illustrate interactions that occurred between teachers and students during the running/walking club:

> Teachers are out there, and even if they're not running, they're walking at a fast pace, at a brisk pace, and it's so funny like you'll have a student who is walking and then a teacher will pass them. They will do everything to keep up with that teacher for as long as they can which is cool. (Ms. Miller, Caucasian)

> I used to walk with them quite a bit until I hurt my knee and they said, "Mr. Rodriguez, Mr. Rodriguez." They want to hang around me and want to walk with me and when we're talking and the things we are learning about because I have fourth, fifth, and sixth graders. So it could be different age groups and different grades that I'm walking with and while we're walking, we're talking and all that we're learning and so it just goes together…[It] makes it fun. (Mr. Rodriguez, AI)

Discussion

The running/walking club described in this study was part of a larger healthy living intervention project, which aimed to develop healthy and active schools in a specific AI community. It differs

from other similar running/walking clubs in the literature because it was offered as a before-school program in which both students and teachers participated.

The first purpose of this study was to examine the daily distance students covered in the club. Overall, students ran/walked between about 0.6 and 1.0 mile per day for each of the data collection weeks, which was a significant contribution to their daily PA. Table 2 shows that students of each grade level, as well as students overall, covered significantly longer average daily distances throughout the year, which may reflect improvements in cardiovascular fitness and/or motivation. Of course, the varied durations of the running/walking club among classes limit our capability to make these assertions. However, when students were asked during spring fitness testing to report the activities they performed to reach or maintain their healthy fitness zone status, an overwhelming majority of them (87%) reported working their cardiovascular health by running (Finkelstein, 2011). Also, the school frequently (i.e., once a month) organized so-called "fun runs," which provided students an incentive to train during the running/walking club. This information seems to lend support to the assertions we made above.

The results of this study indicated grade level differences in terms of the daily average distance that students covered (Table 3). Specifically, the fifth and sixth grade students covered significantly longer distances than younger students during some of the data collection periods and across the four data collection periods, which is not surprising because of the anatomical and physiological changes that occur with age. At the same time, however, kindergarten students covered significantly longer distances than older students during the third data collection period and across the four data collection periods. Although this could be a result of the varied duration of the running/walking club among classes, it might also reflect that younger children can be more easily motivated. Another possible explanation for this trend might be that older children are more likely to be overweight or obese (e.g., Wang, 2011), and they may have more difficulty moving as fast as normal-weight children. Although no BMI data were collected during the healthy living project for students in kindergarten through fourth grades, characteristically during the third year of the project, about 53% of the fifth and sixth grade students who participated in fitness testing in this particular school were obese (BMI-for-age > 95th percentile; comprehensive health-related fitness data from this project can be found in Brusseau,

Finkelstein, Kulinna, & Pangrazi, in press). Also, within the same project, when pedometer-determined PA patterns of students were examined, normal-weight students were found to be significantly more active than both overweight (+436 steps) and obese (+1170 steps) students during total day PA (Brusseau, Kulinna, & Tudor-Locke, 2012).

Gender differences were found in this study for kindergarten students and for all students regardless of grade level, with male students covering significantly longer average daily distances than female students. Although relatively small (.05–.15 miles), these differences seem to be consistent with the differences found for school day PA by studies that investigated AI children's PA levels (Brusseau et al., 2012; Brusseau et al., 2013). These differences may also point to the need to pay particular attention to female students' PA patterns from a young age. At the same time, however, these results seem to conflict with the results of Johnson et al. (2007), who did not find statistically significant gender differences in AI children's school day PA.

Despite the varied duration of the running/walking club among classes, all students received the opportunity to run/walk for at least 10 min each morning, which, if of moderate-to-vigorous intensity, can be one sixth of the daily amount of PA recommended for children (USDHHS, 2008). At the same time, students who participated in the club for 20 min on a given day had the chance to accumulate one third of the daily amount of recommended PA. Although the intensity of students' PA was not monitored during the running/walking club, these additional amounts of PA, coupled with PE and/or recess, provided students with sufficient opportunities to meet and/or exceed daily PA recommendations. This is particularly important for the specific population of AI children in which reduced PA levels have contributed over the last few decades in the development of a high prevalence of obesity and related adverse health outcomes such as type 2 diabetes. As mentioned in the introduction, studies that targeted AI populations found that PA is associated with a lower risk and lower incidence of type 2 diabetes (e.g., Fretts et al., 2009; Kriska et al., 2003). Specifically, Fretts et al. (2009) found that even modest amounts of PA are associated with a lower risk of diabetes in AI populations.

The second purpose of the current study was to gain insights on the teachers' perspectives of the running/walking club. Interview data revealed that teachers valued and supported the club, particularly

for its potential to improve the health status of their students. This finding is corroborated by Cothran, Kulinna, and Garn's (2010) finding that teachers' willingness to engage in a curricular project focused on the integration of PA into the school day was positively influenced by caring about their students and their wellness needs beyond the classroom and school day. The teachers employed at the schools in the current study and in Cothran et al.'s (2010) study were aware of the health disparities of their students, which was a central reason for embracing programs related to PA and healthy behaviors. Therefore, awareness should be integral to interventions that aspire to engage teachers in the promotion of healthy and active behaviors.

Interview data also pointed out that teachers perceived that they functioned as positive role models for the students in the running/walking club, with their own participation positively impacting students' participation. This finding is particularly important because it indicates classroom teachers' potential to significantly contribute in educating the whole child and improving their students' health, which has traditionally assumed to be the sole responsibility of the PE teacher. Considering the current conditions of limited PE time allocation (Center on Education Policy, 2007; Hardman, 2007), more PA opportunities are clearly needed to help children meet and/or exceed daily PA recommendations. As described in the introduction, over the last few years, there has been a push to implement comprehensive school PA programs, in which PE teachers function as directors of PA and in which other education stakeholders (i.e., faculty, staff, parents, and community) are actively recruited in the process of promoting PA throughout and beyond the school day. Thus far, however, school faculty have been predominantly involved in integrating PA and related content in the classroom in the form of PA breaks (e.g., Cothran et al., 2010; Erwin, Beighle, Morgan, & Nonland, 2011). The current study points out that classroom teachers can contribute to students' PA and wellness outside of the classroom as well.

The process of engaging teachers in school-based wellness/PA interventions is not without barriers. However, investing time and effort in making teachers allies in such efforts is important because the individual teacher has a central role in determining both the success and the sustainability of reform initiatives (Fullan, 2007). In fact, the teachers' perceptions of the change effort and consequences, not necessarily the quality of the new program, may ultimately determine the success of a change initiative. Studies have

demonstrated that wellness/PA interventions are more likely to be successful if they are based on an ecological framework, follow a bottom-up design that engages teachers in the decision-making process, have administrative support, include teacher training and continuous support, and consider barriers teachers face such as scheduling and testing pressures (e.g., Cothran et al., 2010; Kulinna, Brusseau, Cothran, & Tudor-Locke, 2012).

This study has several limitations. First, because the school did not use a bell system, we could not monitor the duration of the running/walking club for each class. Second, due to the nature of data collection (i.e., counting laps), we did not monitor the intensity of students' PA during the running/walking club. Third, we did not provide students with the opportunity to provide their thoughts about this before-school program, which would help shape a more complete picture about the whole experience. Fourth, we did not follow up with the schools to determine the extent to which this before-school running/walking program continued after the completion of the healthy living intervention. Future research should (a) use more objective tools to monitor students' PA (e.g., pedometers or accelerometers), (b) include students' voice, and (c) conduct systematic follow-up checks to determine the degree of program continuity after the completion of the study.

In conclusion, the findings of the current study indicate that a running/walking club in the form of a before-school program can help students significantly increase their PA levels, particularly for sedentary or low active populations such as AI. Furthermore, results suggest that teachers value such programs when they see their necessity as well as that teachers can serve as positive role models for students, encouraging them to participate in regular PA. Although running/walking clubs in the literature have been predominantly reported to be in place in the United States, similar programs should be promoted in schools worldwide.

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