

# School Sport Participation Under Two School Sport Policies: Comparisons by Race/Ethnicity, Gender, and Socioeconomic Status

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## Abstract

**Background** School-based extracurricular sport remains an effective strategy to increase physical activity. However, school sport is often limited to a small number of elite athletes. Few schools provide more inclusive sport programs that offer a wider array of activities regardless of ability.

**Purpose** The aim of this study was to examine school sport participation in middle schools (ages 11–14) with contrasting school sport delivery strategies (intramural vs. interscholastic).

**Methods** Data were obtained through an online survey administered to students at four public middle schools (grades 6–8) in a southeastern US city ( $n=2,582$ ).

**Results** More students participated in school sports at intramural schools. Boys were more likely to participate in after-school sports at intramural schools. Low-income and Black children, two groups at greater risk of physical inactivity and other negative outcomes, had greater participation in intramural programs.

**Conclusions** After-school intramural sports in middle school is a promising strategy for increasing sport participation.

**Keywords** School sport delivery · Intramural sport · Physical activity · Disparities · Middle school

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## Background

Despite the well-known benefits of regular physical activity for children and adolescents, a significant percentage of children in the US between the ages of 6 and 17 are not meeting the daily minimum of 60 min of moderate to vigorous physical activity recommended by the US Department of Health and Human Services [1, 2]. National level prevalence estimates using accelerometers show that only 42 % of children ages 6 to 11, and 15.6 % of children 12 to 19, accumulate 60 min of daily physical activity [1]. Additionally, disparities in physical activity participation exist among population subgroups [3]. Research using self-report data indicate that greatest disparities in physical activity participation were between racial/ethnic subgroups [4]. However, secondary analysis of objectively monitored physical activity data suggests the greatest disparities in physical activity among youth are by gender and age [3]. Moreover, while youth from all backgrounds generally do not meet national recommendations, girls and children from African American, Latino, and low-income backgrounds are more likely than their counterparts to not meet physical activity guidelines [5–7].

Schools have been singled out as the primary institution for promoting physical activity among youth because they exist in all communities, school attendance is mandatory, and schools have staff, equipment, and facilities to support physical activity [8]. Furthermore, school-based extracurricular organized sport provides opportunities for physical activity beyond the school day. Unfortunately, opportunities for school-based extracurricular sport participation have declined in recent years [9, 10]. Time constraints, school funding reductions, and increased competition with various institutional academic demands have all contributed to this

decline [11–13]. Current policies for school sport structure and delivery imposed by these constraints may be diminishing opportunities for all students to participate in school sports.

Traditionally, school sports within the USA are dominated by a competitive interscholastic sport model that limits participation to a small percentage of a student population [14]. Although the benefits of participation in interscholastic sports are well documented [15–17], questions remain about whether an exclusive interscholastic sport model best meets the needs of all students [18]. Of particular concern is whether such policies limit opportunities for students in higher risk groups.

More inclusive alternative policies and programs for school-based sport, such as intramurals and club sports that focus on participation rather than competition, have been recommended by both the Institute of Medicine [18] and the National Association for Sport and Physical Education [19]. These alternatives facilitate opportunities for more children to participate in sport and introduce children from diverse backgrounds to a wider variety of sports. For example, a recent study found that intramurals are associated with higher physical activity levels than interscholastic sports for boys [20]. Furthermore, exposure to different types of sports nurtures a sense of competence and enjoyment that last beyond a child's school years [18] and can set adult lifestyle patterns [21, 22].

Interscholastic sports have also been criticized in the USA for perpetuating racial segregation where Black student-athletes tend to be over-represented in some sports (i.e., football and basketball) [23] while White students dominate participation in other sports (i.e., swimming, girls' soccer, and baseball) [24]. Previous research suggests that Black students are underrepresented in some sports because of socio-economic status or neighborhood differences [24]. Others [23, 25, 26] suggest that adolescents choose activities that are more culturally accepted by racial or gender-defined social groups and avoid activities dominated by other groups. For example, when 9th and 10th grade students were asked to identify what sports were best for boys or girls, there were distinct differences by gender and race [27]. Black boys were more likely than White boys to identify football as appropriate for boys and White girls were more likely than Black girls to identify soccer as best for girls [27].

Most research on school sport participation has focused on high school level athletics (ages 15–18) [28]. However, little is known about sport participation patterns among adolescents in middle schools [29]. Drop-out from sports and physical inactivity are characteristic of this age group [17, 30, 31]. One of the few studies that examined sport participation among high school students found that participation in intramural sports fell sharply as children got older.

This decrease was more prevalent among low-income, African American, and Hispanic youth [28]. A prospective study of Black and White girls from the ages of 9 or 10 to the ages of 18 or 19 found that frequency of physical activity for both groups declined significantly. However, a 64 % decline was observed for White girls and a 100 % decline was observed for Black girls [5]. The effect of different school sport programs and students' social and cultural background on sport participation during middle school is largely unknown.

The purpose of this pilot study was to assess the extent of overall sport participation among middle school students and compare sport participation among students in schools with intramural sports to schools using an interscholastic model. We also examined if the degree of sport participation and sport delivery model (Intramural vs. Interscholastic) varied by race, gender, and socio-economic status (SES).

## Methods

Data were obtained through an online survey administered at four public middle schools (grades 6–8) in a southeastern US city. Students completed the survey during school hours under the supervision of a research assistant and a classroom teacher. The survey was administered in May about 4 weeks prior to the conclusion of the traditional school year. Two schools were purposively selected because they delivered sports exclusively through an intramural sports program (IM) instead of a traditional interscholastic sports program (IS). Two other schools in the same city that offered IS exclusively and that most closely matched the student demographics (race and income proportions) of the IM schools were also selected. Table 1 presents demographic characteristics of the four schools included in the study [32]. For the survey component of the study, a passive consent procedure was used. All students in each school were invited to participate in the study. Each student was instructed by their teacher to deliver a letter to their parent/guardian informing them of the study and its purpose. The instructions informed parents that children were not required to participate and that a signed form returned to the student's teacher was required to exclude their child from the study. A student assent question (i.e., "I have permission from my parent/guardian to complete this survey") was included at the beginning of the online survey. A total of 2,582 (response rate=89.8 %<sup>1</sup>) students completed the survey. Due to a low percentage of Hispanic (9 %) and Asian, Native American, or mixed race (12 %) students,

<sup>1</sup> The response rate was calculated by the following formula: number of students that completed the survey/(total school population – absentees) × 100.

**Table 1** Sport participation by grade

School name	Enrollment	Male	Female	American Indian	Asian	Hispanic or Latino	Black or African American	White	Multi-racial	F&R <sup>a</sup>
Intramural 1	606	51.8 %	48.2 %	0.2 %	3.2 %	16.6 %	32.3 %	42.6 %	5.1 %	38 %
Intramural 2	489	49.8 %	50.2 %	0.4 %	1.1 %	10.0 %	50.4 %	34.2 %	3.8 %	47 %
Interschol. 1	551	47.5 %	52.5 %	0.5 %	5.5 %	8.3 %	25.7 %	57.2 %	2.8 %	30 %
Interschol. 2	1157	48.4 %	51.6 %	0.1 %	5.4 %	15.0 %	54.6 %	21.3 %	3.7 %	49 %

Source: Wake County Public Schools [32]

<sup>a</sup>F&R refers to free and reduced-price lunch provided by the school district—a proxy of socio-economic status

an analysis of racial differences was limited to Black and White students.

Sports at the two IM schools were voluntary after-school programs that allowed students in all grades to participate in a variety of traditional sports (i.e., soccer, volleyball, basketball) and nontraditional/modified sports such as “lifetime sports” (i.e., bowling, tennis, golf). Sport offerings at the two IS schools were restricted to students in 7th and 8th grades (a State-level policy in North Carolina restricts 6th graders from playing interscholastic sports) and included boy’s football, boy’s baseball, girl’s volleyball, girl’s softball, and boy’s and girl’s track and field, and cheerleading. IM school sports were inclusive, emphasized participation among all students, and did not include competition with other schools. In contrast, IS school sports only included the best athletes on restricted team rosters and emphasized competition with other schools. Subsequent analyses were run by grade (6th, 7th, and 8th) to examine school sport participation differences between the two different school sport delivery models (IM vs. IS) and to examine the potential impact of a policy that prevents 6th graders from participating in school sports. The data collection procedures were approved by both the Institutional Review Board at the researchers’ university and the participating school district’s Evaluation and Research Department.

## Measures

School sport participation was measured by asking students to identify school sports in which they had participated during the school year. Students were also asked to indicate and identify any sports played outside of school (i.e., community sponsored sports). Given that 6th graders from IS schools were restricted from participating in school interscholastic sports, we expected that these students would be more likely to participate in community sponsored sports (i.e., parks and recreation, YMCA, youth sport leagues) than 6th grade students from IM schools where participation was allowed. Student participants were also asked to indicate their gender and race or ethnicity (White, Black or African American, Hispanic, Asian, American Indian or Alaskan,

Other). Whether or not students received free or reduced price lunch at school was a proxy for SES.

## Analysis

Descriptive statistics are reported for all study variables. Chi-square analysis was used to test for associations between sport participation and type of school sport delivery model (interscholastic vs. intramural). Chi square was also used to examine associations between participation in specific sport activities (soccer, football, basketball, track, volleyball, and softball) and type of sport delivery model. Logistic regression models were estimated to examine the probability of school sport participation based on each socio-demographic characteristic measured in the survey (gender, race, SES). Subsequently, separate equivalent binomial logit models were estimated for IS and IM schools to examine differences in sport participation patterns and to assess the relative strength of race, gender, and SES to predict sport participation in different sport program settings. Wald’s  $\chi^2$  and odds ratios were used to establish which of these variables were stronger predictors of sport participation in each sport program type.

## Results

The sample consisted of approximately an equal percentage of boys and girls (49 % vs. 51 %, with 1.4 % missing). A plurality of students were White (49.6 %) followed by African American (30.1 %), Hispanic (8.5 %), and other ethnic groups (11.8 %). Thirty-four percent of students reported receiving a free or reduced-price lunch. Descriptive results comparing sport participation and type of school sport delivery models are presented in Table 2. Overall, 31 % of the students reported that they played school-sponsored sports over the previous school year. A higher percentage of students participated in school sport at IM schools (35.9 %) than IS schools (27.3 %) ( $\chi^2=18.39$ ,  $df=1$ ,  $p<0.001$ ,  $Eta=0.095$ ). Although this difference was primarily due to the policy restricting 6th graders in IS schools

**Table 2** Sport participation by grade

		Interscholastic ( <i>n</i> =1,685)	Intramural ( <i>n</i> =897)	$\chi^2$ ( <i>df</i> =1)	<i>p</i> value	Eta ( <i>η</i> )
Numbers in parentheses represent the percent of all students who played school sport	Participated in school sport					
	6th Grade	0 (0.0 %)	128 (45.7 %)			
	7th/8th Grade	308 (27.3 %)	187 (31.3 %)			
	Overall	308 (27.3 %)	315 (35.9 %)	18.398	<0.001	0.095

from participating in school sports, there was still a slightly larger percentage of students at IM schools playing sports (31.3 %) than IS schools (27.3 %) when comparing just 7th and 8th grade students. An examination of the potential moderating effect of community sponsored sport participation by comparing the percent of students participating in community sports from IM and IS schools by grade level showed no significant differences between the two groups (IM=84.7 %, IS=85.9 %,  $\chi^2=0.667$ , *df*=1, *p*=0.411). Therefore, although 6th grade students at IS schools were not permitted to participate in interscholastic sports, the percentage of all students, including 6th graders, playing community sports at both IM and IS schools was the same.

Descriptive results of gender, race, and SES differences in sport participation between the two school environments are presented in Table 3. Results showed no difference between the percentage of girls participating in school sports at IS schools and IM schools. However, there was a significantly greater percentage of boys playing school sports at IM than IS schools. Although there were no differences in school sport participation between the two school environments among students from higher income households (i.e., no free or reduced-price lunch), there were significant sport participation differences with students from lower income households ( $\chi^2=36.89$ , *df*=1, *p*<0.001, Eta=0.238). A higher percentage of lower income students played school sports at IM schools than students at IS schools. Sport participation between the two school sport delivery models varied by race. Black students in IM schools were more likely to participate in schools sports than Black students in IS schools. Conversely, there was no difference in the participation rates of White students for the two school sport models ( $\chi^2=31.05$ , *df*=1, *p*<0.001, Eta=0.208).

**Table 3** Sport participation by sport delivery model (interscholastic vs. intramural) and socio-demographics

		Interscholastic ( <i>n</i> =1,685)	Intramural ( <i>n</i> =897)	Overall ( <i>n</i> =2,582)	$\chi^2$ ( <i>df</i> =1)	<i>p</i> value	Eta ( <i>η</i> )
Gender	Male	148 (27.1 %)	201 (44.9 %)	349 (35.1 %)	34.30	<0.001	0.186
	Female	159 (27.8 %)	113 (26.85 %)	272 (27.4 %)	18.40	0.720	0.010
Subsidized lunch	Yes	72 (18.4 %)	104 (40.0 %)	176 (27.0 %)	36.89	<0.001	0.238
	No	235 (32.3 %)	210 (34.4 %)	445 (33.3 %)	0.626	0.429	0.022
Race	African American	92 (25.4 %)	160 (45.3 %)	252 (35.2 %)	31.05	<0.001	0.208
	White	164 (27.8 %)	116 (29.2 %)	280 (31.5 %)	1.67	0.196	0.043

Numbers in parentheses represent the percent of all students in the respective category who played school sport

Table 4 presents a comparison of participation by race in the six comparable sports offered in both IM and IS schools. The results indicated that, regardless of race, students at IM schools were significantly more likely to participate in all sports than students at IS schools, with the exception of track and field. The largest differences in participation rates for Black students were seen in basketball and football. Of all Black students at IM schools, 25.9 % played football (compared to 4.7 % at IS schools) ( $\chi^2=57.06$ , *df*=1, *p*<0.001, Eta=0.306) and 30.3 % of Black students at IM schools played basketball (compared to 8.1 % at IS schools;  $\chi^2=51.32$ , *df*=1, *p*<0.001, Eta=0.290). Relatively large differences in rates of participation for Black students were also seen in soccer ( $\chi^2=46.76$ , *df*=1, *p*<0.001, Eta=0.277), volleyball ( $\chi^2=35.59$ , *df*=1, *p*<0.001, Eta=0.238), and softball ( $\chi^2=12.94$ , *df*=1, *p*<0.001, Eta=0.146).

Results of a logistic regression (Table 5) indicate that race and gender were more important predictors of sport participation in IM schools while SES was a more important predictor of participation in IS schools. As a measure of effect size, Nagelkerke's *R*<sup>2</sup> was calculated at 0.029 for the IS model and 0.086 for the IM model, suggesting that overall socio-demographic characteristics may be associated more with sport participation in IM schools than IS schools. The results of the regression models indicated that at IS schools, and after controlling for race and gender, students who did not participate in the subsidized lunch program were nearly twice as likely as students of lower SES (students who received subsidized lunch) to participate in school sports. In IM schools, Black students were significantly more likely (OR = 2.15) than White students to participate in sports at IM schools than White students when controlling for economic status and gender. Finally, controlling for race and economic status, female status reduced the

**Table 4** Comparative sport activity participation by sport delivery model (interscholastic vs. intramural) and race

		Interscholastic ( <i>n</i> =1,685)	Intramural ( <i>n</i> =897)	Overall ( <i>n</i> =2,582)	$\chi^2$ ( <i>df</i> =1)	<i>p</i> value	Eta ( <i>η</i> )
Soccer	White	44 (6.5 %)	38 (11.6 %)	82 (8.2 %)	7.55	0.006	0.087
	African American	3 (0.8 %)	37 (14.7 %)	40 (6.5 %)	46.76	<0.001	0.277
Football <sup>a</sup>	White	27 (4.0 %)	31 (9.4 %)	58 (5.8 %)	12.04	0.001	0.109
	African American	17 (4.7 %)	65 (25.9 %)	82 (13.4 %)	57.06	<0.001	0.306
Basketball	White	21 (3.1 %)	30 (9.1 %)	51 (5.1 %)	16.65	<0.001	0.129
	African American	29 (8.1 %)	76 (30.3 %)	105 (17.2 %)	51.32	<0.001	0.290
Track and Field	White	45 (6.6 %)	10 (3.0 %)	55 (5.5 %)	5.58	0.018	0.074
	African American	34 (9.4 %)	21 (8.4 %)	55 (9.0 %)	0.21	0.647	0.019
Volleyball <sup>b</sup>	White	15 (2.2 %)	27 (8.2 %)	42 (4.2 %)	19.86	<0.001	0.141
	African American	4 (1.1 %)	31 (12.4 %)	35 (5.7 %)	35.59	<0.001	0.238
Softball <sup>b</sup>	White	16 (2.4 %)	19 (5.8 %)	35 (3.5 %)	7.67	0.006	0.087
	African American	1 (0.3 %)	11 (4.4 %)	12 (2.0 %)	12.94	<0.001	0.146

Numbers in parentheses represent the percent of all students in the respective category who played the particular school sport

<sup>a</sup>Girls were not allowed to participate in football in interscholastic programs, but were allowed to participate in flag football in intramural programs

<sup>b</sup>Boys were not allowed to participate in these sports in the interscholastic programs

odds for student participation in sports at IM schools by more than half. Results of the logit models predicted the probability and odds of sport participation for each socio-demographic classification of student by sport program type. These equations reinforced the differential sport participation patterns by SES in IS schools and gender and race in IM schools. In particular, equations highlighted the lower probability of sport participation among low-income students in IS schools and White females in IM schools.

**Discussion**

Prior research has suggested that an interscholastic sport model, which dominates most middle and high schools in the USA, limits opportunities for sport participation [18, 19] especially

among Black and low-income children [33]. Present results contribute to the existing literature in three main ways.

First, findings indicated that an alternate model of intramural sports (IM) not only attracts more students to play sports but may be of particular interest among students from low income and racially diverse households. Although approximately one third of students from all participating schools indicated they had participated in a school sport over the previous academic year, there were significant differences in the proportion of students who participated in sports depending on where they attended school. Where 27.3 % of students in IS schools participated on one or more of their school’s sport teams, 35.9 % of all students in IM schools said they had participated in school sport over the past year. Although the difference in overall participation between the two school sport environments may be due to a state policy which restricts 6th graders from playing

**Table 5** Logistic regression of school sport participation based on gender, race, and economic status

	<i>B</i>	Wald $\chi^2$	Sig.	Odds ratio	95 % Confidence interval for odds ratio	
					Lower	Upper
Interscholastic sport (IS) school ( <i>N</i> =1,685)						
Intercept	0.627 (0.178)	12.42	0.000			
Gender (female)	0.136 (0.151)	0.805	0.370	1.14	0.851	1.54
Race (African American)	-0.059 (0.182)	0.104	0.747	0.943	0.661	1.35
Subsidized lunch (no)	0.670 (0.209)	10.24	0.001	1.96	1.29	2.94
Nagelkerke’s $R^2=0.029$						
Intramural sport (IM) school ( <i>N</i> =897)						
Intercept	0.574 (0.169)	11.57	0.001			
Gender (female)	-0.802 (0.160)	25.26	<0.001	0.448	0.328	0.613
Race (African American)	0.767 (0.177)	18.80	<0.001	2.15	1.52	3.04
Subsidized lunch (no)	0.063 (0.196)	0.104	0.747	1.07	0.725	1.57
Nagelkerke’s $R^2=0.086$						

Outcome variable is Participation in School Sport (1 = yes); standard errors in parentheses



interscholastic school sports, these findings show quite clearly that when given the opportunity to participate, more children will play sports in school. This finding is also somewhat expected as most IS sports have limited teams and spaces for students whereas IM sports accept all students who want to play. Furthermore, when combined with previous research, that boys exhibit higher physical activity levels in intramurals than interscholastic sports [20], these findings also suggest intramurals may be more effective than traditional interscholastic sports at increasing daily physical activity levels among middle school children.

Even if the current policy restricting 6th graders from playing sports were removed, it is unlikely that more students would play sports in schools that exclusively offer interscholastic sports. The traditional model of interscholastic sports is typically limited by a finite number of available spots or positions on each team, particularly with sports like football and basketball. Therefore, while providing 6th graders with the opportunity to “try-out” for sport teams may increase the number of 6th grade participants, the overall number of students participating in school sports across all grades would likely remain unchanged due to the displacement of current participants. Keeping 6th grade students engaged is critical as prior research has shown that both physical activity and sport participation rates decline around the beginning of middle school [34–36]. Thus, increasing opportunities to engage children rather than providing additional barriers should be considered.

Second, although participation was fairly equal between boys and girls in IS schools, boys dominated participation within the IM schools. One explanation for the higher female sport participation in IS schools may have been the role of Title IX in ensuring equitable opportunities were provided for both boys and girls in interscholastic sport programs. It could be that increasing opportunities, due to Title IX, has allowed girls who are most committed to sport participation to play at the interscholastic level. In contrast, girls who have lost interest or dropped out of organized sport are not likely to play regardless of how sport is offered. Because participation in intramurals is not officially restricted by gender, compliance with Title IX in these programs as it relates to participation is less understood by schools and providing opportunities specifically for girls may be less intentional [37].

Even though sports were co-educational at IM schools, participation remained male-dominated. This finding supports previous research that co-educational sports in the USA often retains more masculine sport values (e.g., aggression) and girls may be less inclined to participate in these activities [37]. There is also evidence that sports may be more appealing to girls if they can participate without the presence of boys [35, 38]. Adolescent girls' reluctance to participate in co-educational sports may be the result of

pressure from social norms [39], fear of injury [40], or threat of embarrassment [41]. There is also some evidence that adolescent girls perceive interscholastic team sports as important sites for intimate interpersonal relationships often sought by this age group [42]. Hultsman [43] also found parental influence to be a significant determinant of adolescent sport participation. Because the probability of female participation in the co-educational intramural sports was lowest among White girls, another potential explanation may be based on parental influence and cultural norms. One may speculate that parents of White girls may have discouraged them from participating in mixed-gender and mixed-race physical activities but found same-gender activities available in IS schools more appropriate.

The third major finding was that students from low-income and/or Black households attending IM schools were more likely to participate in school sport than low-income and/or Black students at IS schools. Given that a model of interscholastic sports is dominant in most middle schools across the USA, this finding is consistent with previous research that adolescents who choose to participate in extracurricular sport activities tend to be of higher SES and are more likely to be White [44, 45]. Previous studies also report that lower SES youth are less likely to be physically active than youth from higher SES families [46, 47]. Hultsman [43] found, in a similar sample of middle school students to the one used in the current study, that economic costs of participation were the most significant barrier to sport participation. Similarly, Johnston [28] reported that participation in interscholastic sports was significantly and positively associated with SES. The mechanisms by which economic hardship may serve as a barrier to interscholastic sport participation may occur in different ways. For example, in an age of reduced school budgets, interscholastic sports are cost intensive and often require funding to be borne by participants (e.g., purchase of uniforms and equipment, travel expenses, and participation fees) [48]. It is also possible that children from higher SES backgrounds may have access to privatized recreational sport programs that provide more intense skill development that better prepare these youth to earn a roster spot through the tryout process [24, 25]. The removal of these structural barriers (e.g., cost of participation or lack of historical access to activities) and the provision of more opportunities to participate in school sports, afforded by an inclusive model of intramurals, may yield more benefits for lower SES youth. Indeed, Fredricks and Eccles [49] found that participation on school sports teams was especially important for low-income youth who have a greater exposure to risk factors that can negatively affect their development. Although findings reported by Johnston et al. [28] in their study of secondary schools indicated that intramural sports did not have a higher proportion of participants from low income households, in

contrast to our findings, it was not clear whether this meant that students of lower SES had fewer opportunities for intramural sports or they were less willing to participate. Given that our study was conducted within the same school district and, therefore, controlled for any regional variations in population SES, it seems that having the opportunity to play may be more important to low-income youth than high-income youth.

While there were no significant racial differences in the probability of sport participation in IS schools, Black students were more likely than their White peers to participate in sports at IM schools. Evidence suggests that in school settings, different sports have become racially segregated for different reasons [48]. Goldsmith [24] found that White students avoid sports seen as more culturally appropriate for Black students while Black students are excluded from participating in “White” sports due to structural barriers. It is possible that the roster limits imposed in the IS schools’ sports programs prevented interested, but less skilled, Black youth from participating in sports that were perceived to be culturally appropriate (e.g., football and basketball). However, sports programs at IM schools imposed no limits on the number of students who could participate resulting in increased opportunities for interested, but less skilled, students to play. The removal of structural barriers at IM schools may have encouraged participation by Black students in sports traditionally dominated by White students in IS schools. This pattern was observed in participation differences between IM and IS schools in soccer, volleyball, and softball.

A possible limiting factor of this study was that all participating schools were located in predominantly urban areas with numerous opportunities for community based sport participation. Others have noted that opportunities to participate in non-school sports are more prevalent in higher income urban communities [49]. It may be assumed that students unable to play or uninterested in school sports would have ample opportunity to participate in community sponsored sports or physical activity programs. However, our findings indicate that even when 6th grade students were restricted from playing school sports they were not likely to participate in more community sports than students from schools where 6th grade participation was allowed. Additionally, while the opportunity to play community sports may be assumed for students in families who have the financial resources to enroll their children in community sports, low-income families and/or families living in rural environments are less likely to have the same opportunities [33] and rely on school sponsored sports as a primary outlet for physical activity. An additional limiting factor was that other determinants often associated with sport participation (i.e., athletic ability, parental support, lack of time) were not assessed in this study. Although the potential moderating effect of these variables was likely controlled by the selection of schools with relatively similar

demographic profiles in the same community, future research should include additional determinants commonly associated with sport participation. Interpretation of findings was limited by a sample of only four schools which did not allow for an analysis of behavioral clustering by school. Future studies should include a sufficient number of schools to allow use of the school as the unit of analysis. Finally, our measure of school sport participation (i.e., self-reports) did not include indices of reliability or validity. Future studies should consider the use of more objective measures of school sport participation (i.e., team rosters, sport league administrator/coach reports).

## Conclusions

As resources for public education continue to diminish, school administrators will face increasing challenges allocating money to school sport programs. The restrictive nature of interscholastic sports coupled with an increasing childhood obesity epidemic and an inactive middle school population suggest that current school sport policies may not be creating equitable opportunities for all children to play sports. These findings suggest after-school intramural sports in middle school is a promising strategy for increasing sport participation among all students and especially children from Black and/or low income households. Intramural sports should also consider including segregated gender opportunities to allow girls to participate without the presence of boys. Findings suggest that the addition of intramural sports as a complement to, or in replacement of, existing interscholastic sport programs may be an effective strategy to increase participation in middle school sports and especially those in low-income, racial minority, and rural communities. However, future studies that include multiple schools with varying combinations of after-school sport opportunities and objective measures of sport participation are needed.

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**Conflict of Interest** The authors have no conflict to disclose.

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