

Are We There Yet? Compliance with Physical Activity Standards in YMCA Afterschool Programs

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Abstract

Background: In 2011, the YMCA of the United States adopted physical activity standards for all their afterschool programs (ASPs), which call for children to accumulate 30 minutes of moderate-to-vigorous physical activity (MVPA) while attending YMCA ASPs. The extent to which youth attending YMCA ASPs achieve this standard is unknown.

Methods: Using a cluster-stratified design, 20 ASPs were sampled from all YMCA-operated ASPs across South Carolina ($N=102$). ASPs were visited on four unannounced, nonconsecutive weekdays. Accelerometer-derived minutes spent in MVPA were dichotomized to ≥ 30 min/d of MVPA and < 30 min/d of MVPA. Program characteristics were measured through document review and direct observation and compared to MVPA levels using random-effects quantile regression.

Results: Boys ($n=607$) and girls ($n=475$) accumulated a median of 25.3 and 17.1 min/d of MVPA, respectively, which translated into 33% (range 6.2%–67.3%) and 17% (0%–42.6%) achieving the 30 min/d of MVPA standard, respectively. Increase in time scheduled for activity (10.7–11.7 min/d of MVPA), limited sedentary choices during activity time (6.9–8.9 min/d of MVPA), and staff activity-promotion training (4.8–7.9 min/d of MVPA) were associated with higher accumulated minutes of MVPA for boys and girls. Program revenue, percent activity structure that was for free play, and indoor/outdoor space were inconsistently related to meeting the MVPA standard.

Conclusions: Modifiable programmatic structures were associated with higher amounts of MVPA. These findings suggest that simple programmatic changes could help ASPs to achieve the MVPA standard, regardless of infrastructure or finances.

Introduction

In November 2011, the YMCA of the United States adopted physical activity (PA) standards for all their ~7000 afterschool programs (ASPs) across the United States. The standards call for program providers to ensure all children engage in at least 30 minutes of moderate-to-vigorous physical activity (MVPA) during the ASP, every day of the school year. The adoption of the standards at a national level holds significant public health relevance for PA promotion and childhood obesity prevention given the extensive reach of YMCA facilities across the United States, with more than 2700 facilities in over 10,000 communities serving 9 million youth (www.ymca.net/organizational-profile).

The extent to which YMCA-operated ASPs meet the PA standards is unknown. In previous studies,^{1,2} between 15% and 30% of boys and girls accumulated 30 min/d of MVPA while attending an ASP (both YMCA and non-YMCA operated). Recently, studies have shown this number can increase to as high as 50% through coordinated approaches to better structuring of the ASP setting and staff training to promote PA.^{3,4} Unfortunately, this increase still remains well below the stated policy goal of “all children” achieving the PA standard. The purpose of this study was to provide an estimate of the percentage of children in YMCA-operated ASPs meeting the PA standard. In addition, this study investigated the cross-sectional associations of program characteristics with the amount of MVPA children

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accumulated. This information serves as baseline from a single southeastern state involved in a statewide initiative to achieve the PA standards across all YMCA ASPs.

Methods

Sampling Strategy for Evaluation of ASPs

A total of 21 YMCAs operate independently across South Carolina. One Association did not operate an ASP and therefore was not included in the sampling strategy. The remaining 20 Associations collectively operated 102 programs with a median of 4 programs per association (range of 1–13 programs operated by a single Association). Based on fall 2014 enrollment, these programs served 5244 children aged between 5 and 12 years. Across all 20 Associations, programs were operated in YMCA facilities (25%), schools (64%), churches (3%), and community locations (7%). For the purpose of this study, no programs were selected that operated in churches ($n=3$) or in community locations ($n=7$; in this sample, “community” referred to programs operating within apartment complexes), given the low number of programs operating within these settings.

The sampling strategy included a single program from each of the 20 Associations. This was deliberate given the differences in organizational structure and capacity across the Associations, the need to ensure representativeness of ASPs dispersed geographically throughout the state and to

include all YMCA partner Associations. Second, to ensure sufficient sample size at the child level and representativeness of programs of all sizes, programs were first grouped by Association and, second, stratified by enrollment. For Associations that operated a single program ($n=5$), the program was selected. For Associations that operated two or more programs ($n=15$), the following sampling strategy was used. For Associations where all programs enrolled fewer than 50 children ($n=3$), the largest program was selected. For Associations that operated programs with more than 50 children enrolled ($n=12$), a single program was randomly selected from these. The locations of all YMCA-operated ASPs in South Carolina are indicated in Figure 1. All sites selected as an evaluation site, both randomly and nonrandomly, agreed to participate as part of their Association’s commitment to the project. The 20 programs operated for an average of 210 min/d (range from 165 to 240 min/d). Included is the enrollment size and location of the 20 selected evaluation sites, the location of the nonevaluation sites, as well as the operating budget of each YMCA and the percentage of that budget from child care services. Comparisons between evaluation and nonevaluation sites are presented in Table 1. All parents were informed of the study from their respective ASP location. Parents were provided an option to opt-out (passive consent) their child to participate. Children verbally assented on each day where data occurred to participate in the measures. All methods were approved by

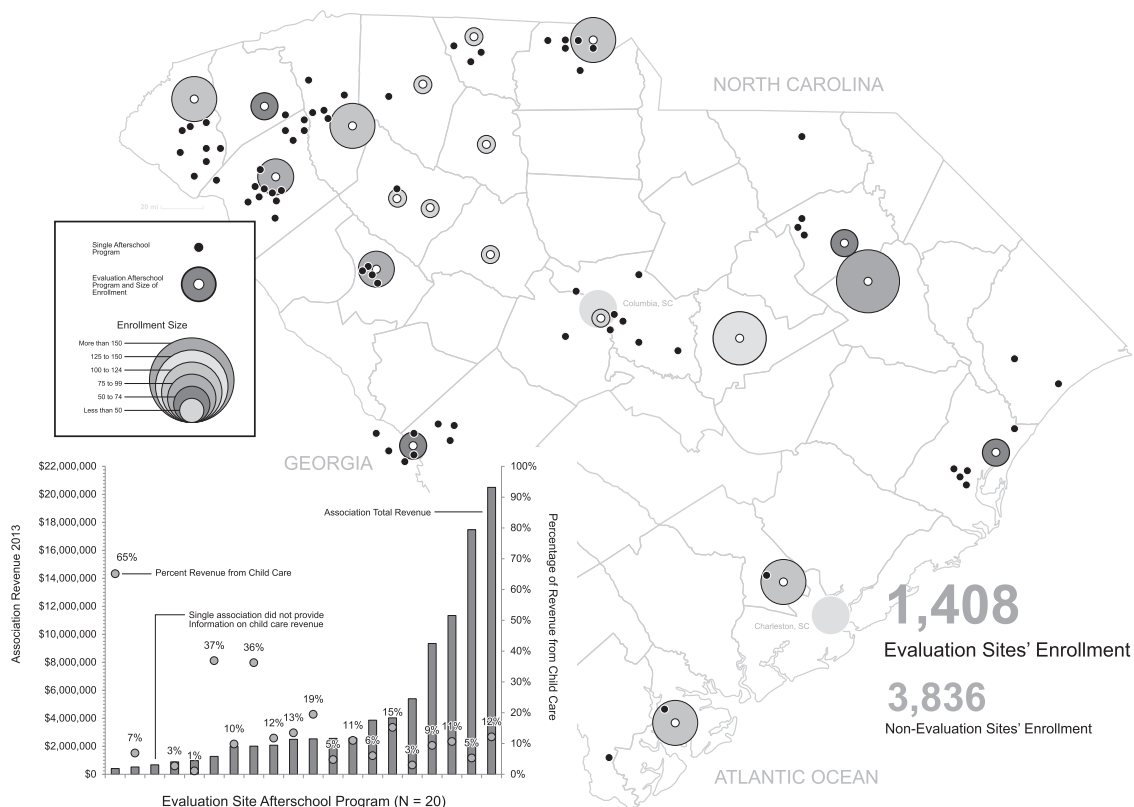


Figure 1. Location of evaluation and nonevaluation YMCA-operated programs in South Carolina and Association-reported annual revenue.

Table 1. Evaluation and Nonevaluation YMCA-Operated Afterschool Program Characteristics

	Evaluation sites (n = 20)	Nonevaluation sites (n = 71)
Number of children enrolled (average per ASP), mean ± SD (range)	70 ± 39 (15–155)	48 ± 41 (5–248)
<50, %	35	68
50–75, %	25	20
76–100, %	20	3
101–125, %	10	3
126–150, %	5	6
>150, %	5	1
Total children served	1408	3836
Number of staff (average per ASP), mean ± SD (range)	7 ± 5 (2–18)	4 ± 3 (1–16)
Households in poverty, mean ± SD (range) (in %)	13 ± 6 (4.3–22.2)	14 ± 6 (2.9–31.4)
Age (years), ^a mean ± SD (range)	7.6 ± 1.7 (5–12)	(5–12)
Girls, ^a %	44	
Serve a snack (ASPs), %	95	99
Receive State of Federal reimbursement for snack, %	35	61
Serve a hot meal (ASPs), %	10	7
Receive State of Federal reimbursement for meal	10	7
Available program space, ^a (ft ²)		
Indoor	9128 ± 4386	
Outdoor	137,755 ± 87,095	
Location		
YMCA, %	44	20
School, %	56	66
Other, %	0	13
Revenue		
Total operating revenue, US\$	5,303,181	
Revenue from child care, %	14.6	

^aPhysical indoor and outdoor space, gender, and age of children enrolled information was not collected from nonevaluation sites.

ASPs, afterschool programs; SD, standard deviation.

the Institution Review Board of the University of South Carolina.

Measures

All measurements occurred during the spring (March through April) of 2015. Consistent with previously established protocols, each ASP was visited for data collection on four nonconsecutive, unannounced days from Monday through Thursday.^{1,3,5,6} Fridays were not assessed because children typically did not have homework over the weekend; therefore, the schedule of the ASPs was altered in comparison to the schedule of activities occurring on all other weekdays, which includes time for homework completion. Child demographics were self-reported, and standing height

and weight were measured using standard protocols with children wearing light clothing.⁷

The primary PA/sedentary behavior outcome was derived through accelerometry. All children attending an ASP on measurement days had an opportunity to wear an ActiGraph GT3X+ accelerometer. Accelerometer data were distilled using 5-second epochs to account for the intermittent and sporadic nature of children's PA⁸ and to capture the transitory PA patterns of children.^{9,10} Upon arrival to the ASP, children were fitted with an accelerometer and the arrival time was recorded (monitor time on). Research staff continuously monitored the ASP for accelerometer wear compliance. At the time of a child's departure, research staff removed the accelerometer and recorded the time (monitor

time off). Children wore the monitors for the entire time in attendance at the ASPs. Cutpoint thresholds associated with moderate and vigorous activity were used to distill the PA intensity levels¹¹ and sedentary behavior.¹² Children were included in the study if they had one or more valid days of accelerometer data defined by a total wear time (time off minus time on) of ≥ 60 minutes.^{1,6,13} The minutes all children spent in MVPA were dichotomized to represent those children who achieved (*i.e.*, ≥ 30 minutes of MVPA/d) and those who failed to achieve (*i.e.*, < 30 minutes of MVPA/d) the PA standard.¹⁴ As a secondary outcome, time spent sedentary was dichotomized into children spending 60 minutes or more sedentary versus those children who spent less than 60 minutes sedentary while attending the ASP.¹⁴

Program Characteristics

Program characteristics were identified through a review of program activity schedules (schedule PA, sedentary choice during PA time) and on-site observation (free play vs. organized PA opportunities). Program schedules were collected on each of the four data collection days. Scheduled PA was defined as the amount of time allocated for PA opportunities as indicated by the program schedule. Sedentary choice during PA time was defined as the amount of time children could choose to participate in a sedentary activity (*e.g.*, computer laboratory) during PA time. Two research assistants coded all schedules independently. Discrepancies between the two research assistants in the number of minutes coded for PA time or sedentary choice during PA time were resolved through consensus. If consensus could not be reached, the program site leader was contacted for clarification.

A valid and reliable systematic observation instrument¹⁵ was used to identify the percent of time activities were organized or free play. Organized PA opportunities were defined as planned activities led by staff, including games (*e.g.*, tag, duck-duck goose), dances, sports, and races. Free play PA opportunities were defined as unplanned and/or not led by staff, and commonly consist of children being released to play in an area with fixed (*e.g.*, playground, basketball goals) and/or portable PA equipment (*e.g.*, balls, jump ropes) while supervised by staff. Trained observers completed all observations. Observers completed classroom training, video analysis, and field practice before data collection. Classroom training lasted 3 hours and included a review of study protocol, orientation to the instrument, and committing observational codes to memory. Video analysis included watching video clips from ASPs and rating those clips using established protocols. Field practice/reliability scans were completed on at least 6 days in participating sites (*i.e.*, 3 hours each day) before the beginning of the study.

Inter-rater agreement criteria were set at $>80\%$ using interval-by-interval agreement for each category.¹⁵ Consistent with published reliability protocols,¹⁵ reliability was collected before measurement and on at least 30% of data collection days. Inter-observer reliability for the ASP

context, staff behaviors, and structure of the PA opportunities was estimated through interval-by-interval percent agreement and weighted kappa (κ_w). Percent agreement ranged from 84.4% to 99.9% and κ_w ranged from 0.47 to 0.95 (median 0.84). Reliability was checked weekly to identify disagreements. Operational definitions of variables with borderline or low reliability ($<90\%$ agreement) were then discussed with observers to ensure reliability and prevent observer drift.

The annual revenue for each YMCA was collected from their most recent publicly available annual reports from 2013. Based on the ASP site directors' report, all areas available for PA (*e.g.*, gymnasium, open green space, and courts), minus water-based PA spaces (*i.e.*, pools), were identified and measured for physical size. Indoor and outdoor PA space was verified by each program site director. Indoor PA area (ft²) was measured using a measuring wheel (Keson RoadRunner; Keson Industries, Aurora, IL). Google Earth software was used to obtain aerial imagery (top down) of the outdoor area for PA. A polygon measurement tool was then used to map target area boundaries. Estimates of the outdoor spatial area (acre) were calculated using Geographical Information Systems (GIS) software using standard protocols.¹⁶

Statistical Analyses

Analyses were conducted summer 2015. Initially, descriptive statistics were computed for min/d of MVPA and time spent sedentary for boys and girls, separately, for each of the 20 evaluation programs. Associations among program characteristics and the amount of time spent in MVPA and sedentary were modeled using random-effects quantile regression modeling at the 50th quantile of the distribution and design-matrix bootstrapped standard errors, separately.¹⁷ This modeling approach was chosen due to the non-normal distribution of the outcome variables and to account for the nesting of children within programs. All program characteristics were separated into low (reference), medium, and high groups based on the 33rd percentiles of the distribution of each characteristic. The amount of previous PA training staff received was dichotomized [none (reference) vs. 1 or more hours per year] since too few programs had more than 1 hour dedicated. Models included age (years), percent of households in poverty based on Census 2014 zip codes, and child BMI classification as overweight or obese. Mixed model logistic regressions were used to examine the odds of achieving the 30-minute MVPA and 60-minute sedentary standards for boys and girls, separately. Time in attendance was used as a covariate in the sedentary quantile and logistic models. The same modeling procedure was used as the quantile regression. All analyses were performed using STATA (v.13.0; StataCorp., College Station, TX).

Results

A total of 1408 children (44% girls) were enrolled across the 20 evaluation ASPs. Of these, 4.9% had parents who

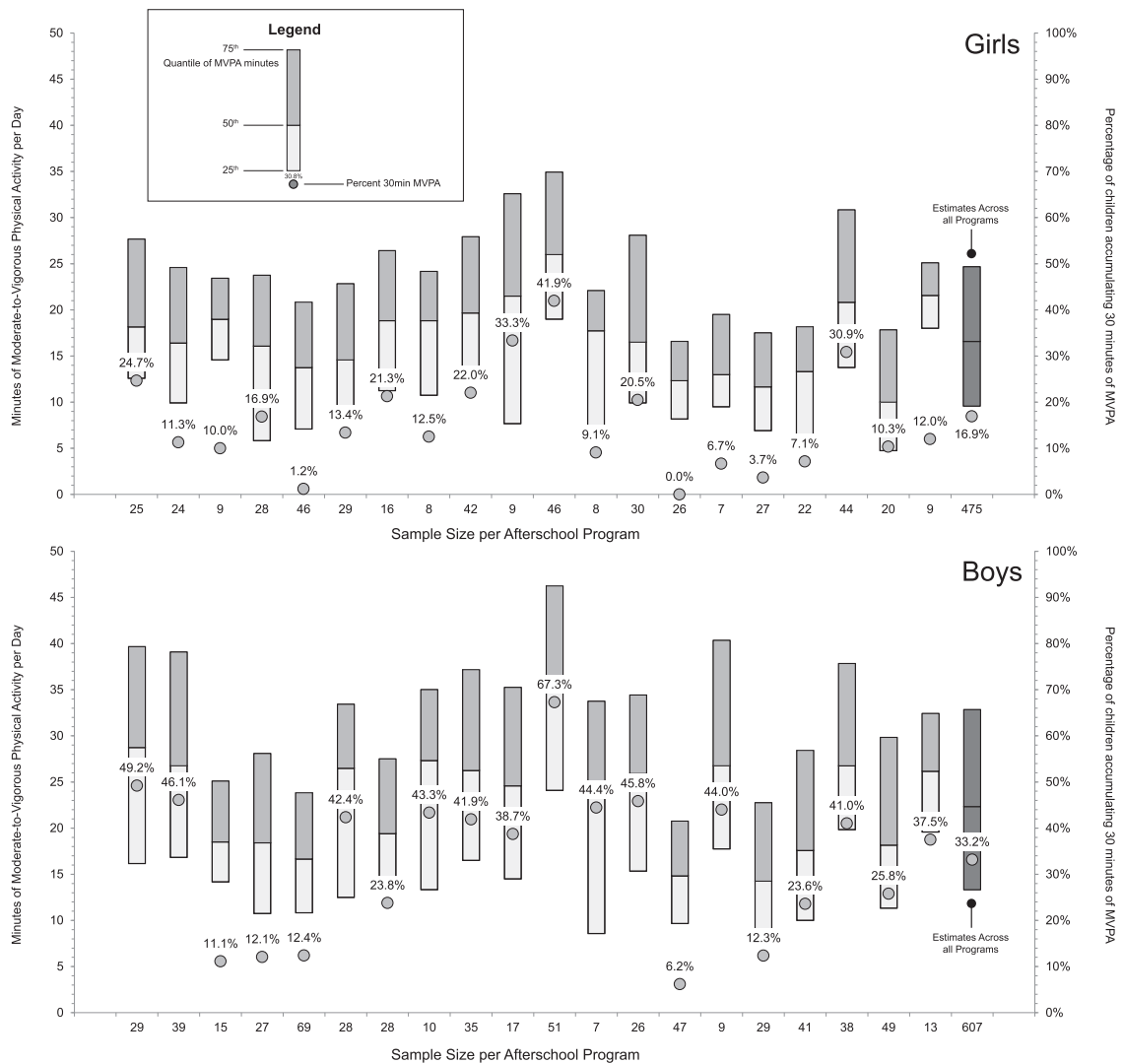


Figure 2. The 25th, 50th, and 75th percentile of minutes of MVPA per day accumulated for boys and girls, and for each program, separately. MVPA, moderate-to-vigorous physical activity.

opted their child out of participating in data collection. A total of 1125 (79.9%) children wore an accelerometer, and 1079 (76.6%) had at least 60 minutes of wear time. The average number of days a child wore an accelerometer was 2.5 days, with 208, 234, 293, and 348 providing 1, 2, 3, and 4 days of data, respectively. The percentage of children meeting the 30 min/d of MVPA standard, the median (50th percentile), and 25th and 75th percentile of MVPA by program are presented in Figure 2 for boys and girls, separately. At the program level, boys accumulated a median of 25.3 min/d of MVPA with this ranging from a low of 14.3 min/d to a high of 35.4 min/d. This translated into ~33% of boys accumulating 30 min/d of MVPA (range 6.2%–67.3% by program). Girls accumulated a median of 17.1 min/d of MVPA, with this ranging from 10.0 up to 26.0 min/d. This translated into ~17% of girls accumulating 30 min/d of MVPA (range 0%–42.6% by program). For time spent sedentary, the median was 59.3 min/d (range 36.3–84.6 min/d) and 65.6 min/d (range

42.3–92.0 min/d) for boys and girls, respectively. This translated into 56.8% of boys (range 22.2%–96.2%) and 71.8% of girls (range 33.3%–95.8%) spending 60 min/d or more sedentary by program.

The results from the mixed-effects quantile regression modeling the 50th percentile of minutes of MVPA/d and time spent sedentary are presented in Table 2. For both boys and girls, higher levels of MVPA were associated with programs providing staff with 1 or more hours of PA-related trainings (+7.9 and +4.8 min/d of MVPA for boys and girls relative to no training, respectively), programs that scheduled a greater amount of time for PA opportunities (+3.9 to 10.7 and +3.1 to 11.7 min/d for boys and girls, respectively), and programs that scheduled a medium level of free play opportunities had boys who accumulated +3.4 min/d and girls who accumulated +2.9 min/d of MVPA compared to programs with the lowest amount of scheduled time for PA and free play opportunities. Conversely, lower levels of MVPA were associated with programs that scheduled the

Table 2. Quantile Regression (50th Percentile) Associations among Program Characteristics and Minutes of MVPA per Day Children Accumulate While Attending an Afterschool Program

	Girls (n = 475)				Boys (n = 605)			
	Minutes MVPA/d Est. (95% CI)	Accumulating ≥30 min/d MVPA OR (95% CI)	Minutes sedentary/d ^a Est. (95% CI)	Accumulating ≥60 min/d sedentary ^a OR (95% CI)	Minutes MVPA/d Est. (95% CI)	Accumulating ≥30 min/d MVPA OR (95% CI)	Minutes sedentary/d ^a Est. (95% CI)	Accumulating ≥60 min/d sedentary ^a OR (95% CI)
Location of operation								
School (reference)								
YMCA	-2.74 (-10.12 to 4.64)	0.34 (0.07 to 1.67)	2.86 (-0.64 to 6.36)	0.49 (0.07 to 3.36)	3.11 (-0.63 to 6.84)	0.52 (0.15 to 1.81)	-2.30 (-7.52 to 2.92)	0.68 (0.14 to 3.46)
Physical activity training for staff								
None (reference)								
1 or more hours	4.84 (3.01 to 6.67)	3.34 (1.22 to 9.18)	-13.81 (-18.64 to -8.98)	0.39 (0.11 to 1.33)	7.94 (5.58 to 10.31)	2.72 (1.23 to 6.01)	-21.65 (-26.33 to -16.97)	0.20 (0.07 to 0.55)
Schedule physical activity opportunities								
Low (30–85 min/d, reference)								
Medium (90–105 min/d)	3.13 (1.07 to 5.19)	7.38 (2.44 to 22.29)	-4.29 (-8.85 to 0.28)	1.52 (0.42 to 5.47)	3.87 (1.17 to 6.56)	3.37 (1.46 to 7.74)	-6.82 (-10.81 to -2.83)	1.35 (0.47 to 3.94)
High (110–160 min/d)	11.71 (6.45 to 16.97)	3.64 (0.64 to 20.68)	-19.51 (-31.37 to -7.66)	0.32 (0.04 to 2.88)	10.66 (3.88 to 17.45)	3.42 (0.83 to 14.05)	-23.62 (-36.28 to -10.96)	0.43 (0.07 to 2.51)
Scheduled sedentary activity choices during activity time								
Low (0 min/d, reference)								
Medium (60 min/d)	-2.80 (-5.78 to 0.17)	0.19 (0.04 to 0.85)	3.46 (-3.11 to 10.03)	1.00 (0.17 to 5.82)	-1.46 (-5.25 to 2.32)	0.43 (0.14 to 1.36)	4.55 (-1.43 to 10.52)	0.89 (0.21 to 3.70)
High (75–120 min/d)	-8.94 (-13.36 to -4.52)	0.73 (0.17 to 3.20)	13.21 (2.24 to 24.19)	1.34 (0.21 to 8.66)	-6.89 (-12.40 to -1.38)	0.58 (0.18 to 1.87)	17.06 (5.04 to 29.08)	1.40 (0.32 to 6.13)
Percent of activity opportunities dedicated for free play								
Low (0%–20%, reference)								
Medium (45%–74%)	2.85 (0.75 to 4.95)	2.97 (1.64 to 5.38)	-11.21 (-14.97 to -7.46)	0.45 (0.27 to 0.76)	3.38 (1.02 to 5.74)	1.67 (1.13 to 2.49)	-9.75 (-13.55 to -5.96)	0.45 (0.31 to 0.65)
High (75%–100%)	-1.19 (-3.06 to 0.67)	1.00 (0.53 to 1.88)	-3.97 (-7.83 to -0.11)	0.50 (0.28 to 0.88)	0.80 (-1.58 to 3.17)	1.85 (1.19 to 2.89)	-4.65 (-8.33 to -0.97)	0.57 (0.38 to 0.88)

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Table 2. Quantile Regression (50th Percentile) Associations among Program Characteristics and Minutes of MVPA per Day Children Accumulate While Attending an Afterschool Program continued

	Girls (n = 475)				Boys (n = 605)			
	Minutes MVPA/d Est. (95% CI)	Accumulating ≥30 min/d MVPA OR (95% CI)	Minutes sedentary/d ^a Est. (95% CI)	Accumulating ≥60 min/d sedentary ^a OR (95% CI)	Minutes MVPA/d Est. (95% CI)	Accumulating ≥30 min/d MVPA OR (95% CI)	Minutes sedentary/d ^a Est. (95% CI)	Accumulating ≥60 min/d sedentary ^a OR (95% CI)
Association annual revenue (US\$)								
Low (\$414,344–\$2,016,974 reference)	-1.67 (-4.00 to 0.67)	1.73 (0.42 to 7.07)	-0.62 (-6.11 to 4.87)	0.91 (0.24 to 3.43)	-0.02 (-3.21 to 3.17)	0.87 (0.28 to 2.71)	-2.61 (-8.03 to 2.80)	1.04 (0.30 to 3.65)
Medium (\$2,080,562–\$4,031,813)	1.37 (-1.08 to 3.82)	1.79 (0.39 to 8.14)	-7.79 (-13.21 to -2.37)	0.51 (0.12 to 2.11)	2.47 (-1.03 to 5.97)	0.78 (0.23 to 2.64)	-8.00 (-13.89 to -2.11)	0.77 (0.20 to 2.89)
High (\$5,402,419–\$20,497,061)								
Indoor physical activity space (ft ²)								
Low (0–3824 ft ² , reference)								
Medium (4461–6009 ft ²)	3.54 (1.15 to 5.94)	1.00 (0.26 to 3.80)	-5.40 (-11.16 to 0.36)	0.46 (0.11 to 1.83)	1.73 (-1.26 to 4.72)	0.55 (0.18 to 1.70)	-5.41 (-9.44 to -1.37)	0.63 (0.18 to 2.17)
High (7344–15,056 ft ²)	3.47 (1.17 to 5.77)	1.64 (0.49 to 5.57)	-5.41 (-9.91 to -0.91)	0.66 (0.19 to 2.30)	5.00 (2.50 to 7.49)	0.82 (0.30 to 2.26)	-8.51 (-13.34 to -3.68)	0.73 (0.24 to 2.17)
Outdoor physical activity space (ft ²)								
Low (1990–84,751 ft ² , reference)								
Medium (85,271–199,543 ft ²)	1.77 (-0.10 to 3.65)	1.47 (0.44 to 4.93)	-0.32 (-4.97 to 4.33)	2.10 (0.59 to 7.48)	2.13 (-0.74 to 4.99)	1.36 (0.49 to 3.75)	-2.09 (-5.62 to 1.43)	1.74 (0.58 to 5.25)
High (231,936–281,125 ft ²)	-3.02 (-5.59 to -0.44)	0.28 (0.06 to 1.29)	7.55 (1.95 to 13.16)	3.90 (0.78 to 19.61)	-4.58 (-7.50 to -1.66)	0.56 (0.15 to 2.05)	11.95 (6.62 to 17.29)	4.48 (1.07 to 18.79)

All estimates control for age (years), percent household poverty.

^aSedentary estimates also control for time in attendance.

95% CI, 95% confidence interval; MVPA, moderate-to-vigorous physical activity; OR, odds ratio.

Bold values significant at $p < .05$.

highest amount of time for children to select a sedentary alternative (e.g., arts and crafts, computer time) during scheduled PA opportunities (−6.9 and −8.9 min/d of MVPA for boys and girls, respectively). Medium to high levels of PA opportunities scheduled were associated with a reduction of time spent sedentary for boys (−6.8 to −23.6 min/d) and girls (−19.5 min/d). A high level of time for children to select a nonactive alternative during scheduled PA opportunities was associated with a greater amount of time spent sedentary for both boys (+17.1 min/d) and girls (+13.2 min/d). The relationship among annual revenue and indoor and outdoor space showed inconsistent associations with minutes spent in MVPA or sedentary for both boys and girls. A medium and high amount of indoor space was associated with girls accumulating ~3.5 min/d more of MVPA and spending fewer minutes (−5.4 min/d for high only) sedentary. For boys, only a high amount of indoor space was associated with larger amounts of MVPA (+5.0 min/d) and lower amounts of sedentary (−8.5 min/d). A high amount of outdoor space was associated with girls and boys accumulating less MVPA (−3.0 and −4.6 min/d) and spending more time sedentary (+7.6 and +12.0 min/d).

For girls, the odds of achieving the 30 min/d of MVPA standard were greater for those attending programs where staff received training [odds ratio (OR) 3.34, 95% confidence interval (95% CI) 1.22–9.18] and where programs scheduled medium (OR 7.38, 95% CI 2.44–22.29) levels of PA opportunities and provided a medium-level amount of activities dedicated to free play (OR 2.97, 95% CI 1.64–5.38). Conversely, girls attending programs that dedicated a medium level of scheduled PA time for sedentary choices were less likely (OR 0.19, 95% CI 0.04–0.85) to achieve the 30 min/d of MVPA standard. Similar associations were observed with boys, where those attending programs with medium (OR 3.37, 99% CI 1.46–7.74) levels of scheduled activity opportunities, had staff who received activity-related training (OR 2.72, 99% CI 1.23–6.01) and provided a medium (OR 1.67, 95% CI 1.13–2.49) or high (OR 1.85, 95% CI 1.19–2.89) amount of activities dedicated to free play, were more likely to achieve the 30 min/d of MVPA standard.

Discussion

This study provides an estimate of the percentage of children achieving the 30 min/d of MVPA standard across YMCA-operated ASPs in a single southeastern state. Overall, only 33% of boys and 17% of girls met the standard. Although this ranged dramatically across programs, with some achieving up 67% of boys and 42% of girls, this is well below the stated goal of all children meeting the standard. Modifiable characteristics of training, program schedule, and the structure of the activity opportunities were more consistently associated with higher MVPA and lower amounts of time spent sedentary for both boys and girls in comparison to unmodifiable program characteristics of indoor and outdoor space and annual revenue. If these findings are supported through experimental studies, these findings may be well

received by practitioners, in that with appropriate training, as well as scheduling and structure, ASP site leaders/staff can help children meet the MVPA standard despite limited resources (space and revenue).

Previous studies^{3,4,18,19} have demonstrated that working with program leaders to develop schedules that provide opportunities for children to be active and providing staff with training to promote PA are important strategies for getting children more active and therefore should be primary components of any approach to achieve the MVPA standard in ASPs. A recent study²⁰ of MVPA levels in non-YMCA-operated ASPs found that whether a program scheduled 60 minutes or greater than 100 minutes of opportunities was inconsequential to children's accumulation of MVPA. However, this study did not account for the possible provision of sedentary activity options (e.g., children can choose from free play on playground or computer laboratory). Intuitively, scheduling more time for PA should be related to increased PA, but based on the findings from this study and others,¹⁶ this might only occur when PA is the only option. This has important implications for practice, as small changes in program scheduling may lead to substantial increases in children's MVPA and decreases in time spent sedentary.

The observed association of free play with higher amounts of MVPA and lower time spent sedentary is likely a function of the quality of the organized, adult-led games.^{21–23} A previous study found that adult-led games, compared to free play opportunities, had a higher amount of inactive elements, such as games with elimination and children standing and waiting in lines.²⁴ This is consistent with another study¹³ that reported adult-led games frequently consisted of dodgeball and kickball, two commonly played games that eliminate children or have long lines of children. While these studies indicate adult-led games have more inactive components and result in lower activity, experimental evidence clearly shows that making simple modifications to these commonly played games can greatly increase time spent in MVPA and reduce time spent sedentary.²³ Moreover, modifying commonly played games to make them more active increases the activity levels of all children by providing them with more opportunities to be involved in games.²³ The results of the present study reinforce the idea that strategies to promote PA, such as removing inactive components of games, are an important component of ASP staff training. In addition, if staff are not well trained or high-quality training is unavailable, free play may be a better option than poorly led organized games.

The reasons for the inconsistent associations between PA/sedentary behavior and facility space are unclear. For instance, girls and boys accumulated more MVPA in programs with the largest amount of indoor space, while both boys and girls MVPA decreased in programs with the largest amount of outdoor space. Based on the observations conducted, programs with larger enrollment had bigger spaces that could allow children in these programs to “disappear” into the background without being noticed by

staff during scheduled PA opportunities. A previous study²⁵ found that boys and girls were more active during outdoor sessions at ASPs, compared to indoor sessions, but it is unknown whether indoor and outdoor space contributed to this finding. Also, in the current study, we did not separate activity that occurred indoor and outdoor. Nevertheless, providing opportunities appears to be a driving factor in children accumulating more MVPA and such opportunities need to be tailored according to the indoor and outdoor spaces afforded to each unique program.

There are a number of strengths to this study, which include the sampling procedure, large number of programs included, the large number of children providing valid accelerometer data, the objective assessment of program characteristics and structure, and the diverse range of programs (small to large enrollment, variation in physical space/amenities) from a single organization. Despite these strengths, the generalizability of the findings outside of this single southeastern state and organization may not be appropriate. However, there is little reason to believe that the findings in this study would not be similar across ASPs operating in other states by similar (*i.e.*, YMCA) or different organizations, especially given the diversity of program characteristics represented in these 20 programs. Also, 20% of the enrolled children did not participate in accelerometer data collection. Because of this, we cannot fully ensure they were not fundamentally different than the 80% who did participate, but the 80% recruitment is consistent with other large-scale school-based studies.²⁶ It is important to note that the MVPA standard evaluated herein was not developed from accelerometer data collected from within the ASP setting. Thus, the use of this device (*i.e.*, ActiGraph) and the associated cutpoints selected to reduce the data may influence either positively or negatively the number of children meeting the MVPA guideline. Finally, the associations presented herein are cross sectional, and therefore, no cause–effect inferences can be made.

In conclusion, no YMCA program fully met the 30-min/d MVPA standard despite having policies in place for multiple years to achieve this goal. The cross-sectional associations indicated that easily modifiable characteristics, such as scheduling and providing staff with training, might be essential programmatic components to achieving the MVPA standard. Future work is required to determine the best approaches to working with program staff to integrate such changes.

Author Disclosure Statement

No competing financial interests exist.

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