

Staff training promoted physical activity among children in summer day camps.

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Effects of a competency-based professional development training on children's physical activity and staff physical activity promotion in summer day camps

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WITH MORE THAN 5,000 summer day camps (SDCs) in operation across the nation and 14.3 million children in attendance annually, SDCs are one setting, outside of school, with the potential to affect the physical activity (PA) of children.¹ Children's PA in SDCs is particularly important because children's body mass index gains are greater over the summer than during the school year.² Recently, the YMCA of the USA adopted PA Standards for its full-day youth programs, including SDCs, to address children's activity levels.³ The adoption of these standards is noteworthy because

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the YMCA of the USA is one of the largest SDC providers in the United States, serving more than nine million youth nationwide. The PA Standards focus on creating a PA-friendly environment by outlining key behaviors staff should exhibit, such as role modeling or verbally encouraging PA, and other behaviors from which staff should refrain, such as withholding PA or prescribing it as a consequence for misbehavior.⁴ However, the PA Standards do not outline strategies SDCs can use to change staff behaviors. Initial evidence suggests that staff and program leaders struggle to integrate behaviors that promote PA into routine practice and that children are largely inactive while attending SDCs.⁵ Staff and program leaders, therefore, need strategies they can use to create SDC environments that align with the PA Standards.

To date, several studies have attempted to increase children's PA in school and afterschool settings, but limited attention has been given to interventions in the SDC environment.⁶ Consequently, little is known about how to most effectively align SDC staff behaviors with PA standards. One promising strategy for increasing desired behavior is competency-based training.⁷ Competency can be defined as "any individual characteristic that can be measured and that can be shown to differentiate significantly between superior and average performers, or between effective and ineffective performers." Competency-based training diverges from traditional training models by focusing on the demonstration of observable skills rather than on knowledge.⁸ We hypothesized that this approach would be effective because staff and program leaders should be able to integrate skills learned in competency-based trainings into their existing program.

In the spring of 2011, the YMCA of Columbia, SC, with the support of the University of South Carolina, adopted the competency-based training approach in an attempt to align staff behaviors with the YMCA of the USA PA Standards for SDCs.⁹ At the midpoint of the partnership, we found promising outcomes in terms of both changing staff behaviors and increasing child activity levels.¹⁰ The purpose of this chapter is to describe a three-year partnership between the university and local YMCAs, whose purpose was to

provide competency-based professional development training, and to outline the effect of the training on children's activity levels in participating SDCs over two years.¹¹

Methods

The results in this paper represent the findings of a multiyear intervention and evaluation using a design featuring single group pre-assessment and multiple postassessments. We observed SDC activities during three summers: in summer 2011, before offering the training, in order to establish a baseline, and again in summer 2012 and summer 2013, to measure the effect of the intervention after staff had received the competency-based training. The methods reported here closely reflect the methods of the midpoint evaluation, whose findings have been reported elsewhere.¹² Passive consent was obtained from participants and their parents due to the observational nature of data collection. The university's institutional review board approved all procedures prior to the start of the study.

Setting and participants

Four SDCs, serving a total of approximately six hundred children each day, participated in the study. The programs provided various PA opportunities throughout the summer, including free-play opportunities; organized games, such as sports and tag; and water-based activities such as swimming or playing at a water park. In addition to PA opportunities, SDCs provided assemblies, typically to begin or end the day; these often included songs, dance, and announcements. They also offered enrichment activities, such as arts and crafts.

Each SDC employed a single site leader and approximately thirty staff members. Site leaders oversaw daily program operations by creating schedules, managing staff, interacting with parents, and so on. Staff members were responsible for leading groups of children through scheduled activities each day. The SDCs provided scheduled activities from 9 a.m. to 4:30 p.m. daily. Children

were grouped by grade level; grade levels were divided into smaller groups of children, with each staff member responsible for ten children. Most children were elementary-aged. Most were enrolled in the program an average of four days a week, eight hours per day, for eight weeks during the summer.

Intervention

The intervention consisted of competency-based training, booster training, a workshop on scheduling SDC activities, and weekly feedback.

Competency-based professional development training. Training was the primary strategy for aligning staff behaviors with the PA Standards. Professional development was delivered in May 2012 and 2013, before the intervention SDC seasons. All trainings were led by trained university personnel and were integrated into mandatory preexisting staff trainings. The preexisting daylong (eight hours) trainings occurred prior to the start of the SDC in May of each year. The PA training, which lasted approximately ninety minutes, was one of many sessions that all staff were required to attend throughout the day.

The competency-based 5Ms training model—mission, manage, motivate, monitor, and maximize—guided the professional development training.¹³ Two elements of the model connect it to a competency-based approach: (a) emphasis on a set of core skills that differentiate between superior and poor performers and (b) experiential training to improve those skills.¹⁴ Identification of core skills is founded in health promotion theory, “best practices” position statements, literature on competencies for PA promotion, and PA policy documents.¹⁵

Embedded in the 5Ms model are the “LET US Play” principles. LET US stands for lines; elimination; team size; uninvolved staff or kids; and space, equipment, and rules.¹⁶ Training consisted of participatory exercises and video demonstrations. Staff first viewed video demonstrations of specific games, such as kickball or tag, which violate the LET US Play principles by including lines, elimination, and large team sizes. Strategies to alter those games in

order to align them with the LET US Play principles were then presented to staff. After each video, staff were debriefed on the strategies presented and asked for additional strategies. Following the video demonstrations, staff participated in the games and modifications presented in the videos. They also practiced strategies for managing children such as using countdowns to transition between activities quickly, actively supervising children, and keeping all children in view. We included management strategies in the training in order to help staff manage and modify games to comply with LET US Play principles. We hypothesized that these management strategies would minimize child wait and instruction time and thereby reduce or eliminate discipline problems.

In addition to learning management strategies, staff were also trained to offer girls-only PA opportunities. This strategy was developed collaboratively with site leaders in an effort to reduce the gap observed at baseline between girls' and boys' activity levels.

On-site booster trainings. A total of nine “booster” training sessions were conducted at each SDC over the two intervention summers: five booster trainings in summer 2012 and four in summer 2013. Each booster session consisted of a “walkthrough” during which site leaders and staff received real-time feedback from university personnel. Walkthroughs occurred during scheduled PA opportunities and lasted approximately two hours per visit. Following each walkthrough, we compiled observation notes and suggestions for program enhancement and presented them to site leaders and staff in a meeting following the conclusion of the SDC that day. Meetings with staff and site leaders to review the notes from the walkthrough lasted approximately forty-five minutes. Suggestions were aligned with competencies presented to staff in the professional development training and based on the LET US Play principles. They focused on modifying games to enhance child PA, managing PA environments effectively, and modeling and encouraging child PA.

Workshop on schedule modification. A lack of detailed schedules was identified by university personnel and YMCA site leaders as one of the barriers to moving quickly through scheduled

activities in SDCs. Prior to the intervention, schedules created by the SDCs listed only general activities, such as “enrichment” or “field games”; they failed to indicate the location, equipment needed, or staff roles in the scheduled activity. This lack of specificity led to extended idle time: children had no task in which to engage while staff decided on the game, organized children, and retrieved and set up necessary equipment for the activity.

As part of the PA intervention, prior to summer 2012, program leaders received a schedule template and attended a workshop about creating schedules that included notations on specific activities, activity location, equipment, and staff roles. Site leaders were also encouraged to designate certain times when girls-only PA opportunities would be offered. Site leaders and the lead author of this paper then built program schedules collaboratively using the scheduling template. Prior to summer 2013, schedules from 2012 were returned to site leaders. Site leaders were encouraged to use the 2012 schedules as a template to build their 2013 schedules. Prior to the start of the 2013 summer program, site leaders provided their completed schedules to the lead author for feedback.

Weekly feedback. During the midpoint evaluation, site leaders and staff received feedback the morning following each site visit. The evaluation team compiled its notes and emailed them to site leaders for distribution to staff. Feedback focused on modifying games, effectively managing children during PA, and modeling and encouraging PA. Feedback was aligned with the 5Ms model and the LET US Play principles.

Instruments

To document staff progress toward encouraging children’s PA, we used validated time-sampling tools to observe staffs’ promotion of PA and children’s activity levels.

System for Observing Staff Promotion of Activity and Nutrition (SOSPAN). Data on staff PA promotion behaviors were collected using System for Observing Staff Promotion of Activity and Nutrition (SOSPAN), an instrument that utilizes momentary time sampling to record instances of staff PA promotion behaviors

consistent with PA standards. SOSPAN, which has been validated and found reliable in the SDC setting, captures thirteen PA promotion behaviors.¹⁷ The instrument is divided into three subsections: (a) staff PA-promoting behaviors, (b) staff PA-discouraging behaviors, and (c) SDC context. The six staff PA-promoting behaviors include behaviors or contextual characteristics of the PA environment over which staff have direct control that are theoretically or empirically linked to increased child activity. Examples include staff verbally promoting PA or providing a girls-only PA opportunity. The seven staff PA-discouraging behaviors include behaviors or contextual characteristics of the PA environment over which staff have direct control that are theoretically or empirically linked to decreased child activity. Examples include staff verbally discouraging PA or requiring children to wait in line for their turn. Finally, SDC context includes scheduled activity and activity location.

Systematic Observation of Physical and Leisure Activity in Youth (SOPLAY). Child PA levels were collected using Systematic Observation of Physical and Leisure Activity in Youth (SOPLAY), which uses momentary time sampling to capture activity levels of large groups of children.¹⁸ The activity codes included in SOPLAY have been extensively used in prior research.¹⁹ For this study, the “vigorous” activity level of the SOPLAY instrument was classified as moderate-to-vigorous physical activity (MVPA).²⁰

Observation schedule and protocol. Data were collected on ninety-eight program days over the three measurement summers. Data collection occurred on unannounced nonconsecutive weekdays at each site throughout June, July, and August 2011, the baseline summer, and in July and August 2012 and 2013, the intervention summers. SOPLAY and SOSPAN scans alternated continuously from the beginning to the end of each program day as follows: SOPLAY, SOSPAN, SOPLAY, SOSPAN. This protocol is different from the traditional SOPLAY protocol, in which target areas are scanned at predetermined times during the day.²¹ Rather, the protocol for this study was designed to hold the time of observations constant across all sites while following a single group of children, regardless of the target area they were using. This

decision was made for two reasons: (a) groups of children within grade levels could have differing daily schedules of activities occurring in different target areas across days and weeks of observation and (b) a given target area might be used by the camp on one day at 10 a.m. but be not used at 10 a.m. any other day. Thus, holding both target area and time of observation in the target area constant would fail to capture many of the daily scheduled activities taking place at the SDCs. Consistent with SOPLAY and SOSPAN protocols, the size, boundaries, and locations of target areas in which the SDC operated at each site were identified prior to data collection.²² Examples of target areas include pools, fields, gyms, and playgrounds. The number of target areas at individual sites ranged from seventeen to twenty-eight, with a total of ninety-one target areas identified across the four SDCs.

On observation days, trained observers arrived unannounced before the program began and followed a randomly selected group of children in a preselected grade level. Grade levels were systematically selected prior to the site visit in order to ensure that at least 75 percent of the groups in each grade level were observed at each site and that each grade level was observed at each site on at least four program days during each summer. The randomly selected groups of children and staff were followed throughout the entire day while observers systematically and continuously scanned the target areas populated by the group. Scans of the children and the staff responsible for the target group started at the beginning of the scheduled program day, at 9 a.m., and were made continuously, alternating between SOSPAN and SOPLAY until the end of the SDC at 4:30 p.m. To prevent observer fatigue, observers took two fifteen-minute breaks and one thirty-minute lunch break during the day.

Observer training and reliability. Prior to data collection, observers were oriented to the study instruments and protocols using classroom training, video analysis, and field practice. Classroom training lasted two days, for six hours each day; it included a review of the study protocol and orientation to the instrument. Video analysis included observing sample videos of SDCs and practicing

entering appropriate codes according to SOSPAN and SOPLAY protocols. Finally, observers completed three hours of training on at least six days at participant programs. This field training included familiarization with target areas at program sites and completing practice scans that helped to establish interrater reliability.

Reliability data were collected prior to measurement and on at least 30 percent of measurement days, or thirty-one total days, across data collection periods.²³ The interrater agreement threshold was set at 80 percent or better, using interval-by-interval agreement for each SOSPAN category.²⁴ The percentage of agreement between observers for SOSPAN behaviors ranged from 81.8 percent to 99.6 percent. Interval-by-interval reliability for SOPLAY activity codes was estimated using one-way random effects single and average measures intraclass correlations (ICCs). Single measures ICCs for SOPLAY categories ranged from 0.80 to 0.97 with average measures ranging from 0.89 to 0.98.

Data analysis

Stata (v.12.0., College Station, TX) was used to complete all statistical analyses. Child activity levels were expressed as the percentage of children observed who were engaged in sedentary, moderate- or vigorous-intensity behavior or MVPA in each SOPLAY scan. Staff behaviors were expressed as a percentage of total SOSPAN scans during which a given behavior was observed. Changes in child activity levels and staff behaviors were examined using random effects linear regression models with scans nested within groups of children nested within SDC sites. Models estimating the percentage of children who were engaged in MVPA and who were sedentary were conducted separately and controlled for the total number of children in each scan and for daily high and low temperatures. Intervention effects were modeled at the site level. Where appropriate, both linear and nonlinear terms were included in models to account for the nonlinear change in staff behaviors and the percentage of children who were engaged in MVPA or were sedentary over time. Secondary models were estimated by grade level during scheduled PA.

Results

Over the three measurement periods, 12,803 SOSPAN and SOPLAY scans were completed during scheduled program time. A total of 8,348 SOSPAN and SOPLAY scans were completed during scheduled PA.

Changes in children's PA levels

High and low temperatures did not demonstrate statistical significance in the model and were removed from final analysis. Changes in the percentage of children who were sedentary and who were engaged in MVPA across all scheduled activities are presented in Table 4.1. There was a statistically significant reduction from baseline to the second summer of the intervention in the percentage of children who were sedentary across all scheduled activities with the exception of “other,” where a slight decrease was observed. During scheduled PA, we observed reductions in the percentage of sedentary observations of 16.9 percent for girls and 17.4 percent for boys from baseline until the final intervention summer. The largest reduction in the percentage of children who were sedentary was observed during organized PA, with a reduction of approximately 23.7 percent for girls and 24.8 percent for boys. Conversely, statistically significant increases in the percentage of girls and boys engaged in MVPA were observed during free play, organized PA, and assembly. A statistically significant increase in the percentage of girls in MVPA was also observed during enrichment. The largest statistically significant increases in MVPA were observed during assembly, with a 12.6 percent increase for girls and a 6.9 percent increase for boys. Changes in the percentages of children engaged in MVPA during swimming were observed (13.6 percent for girls, 9.2 percent for boys), but those changes did not reach statistical significance. The largest statistically significant increase of MVPA during scheduled PA occurred during organized PA activities: 8.1 percent for girls and 6.4 percent for boys.

Table 4.2 presents changes in the percentages of boys and girls who were sedentary and engaged in MVPA during scheduled PA,

Table 4.1. Girls' and boys' sedentary and MVPA time by scheduled activity

Scheduled activity	Percent of total scans observing the activity									Girls									Boys								
	2011			2012			2013			Change ^d	Percent in MVPA			Change ^d	Percent sedentary			Change ^d	Percent in MVPA			Change ^d					
	2011	2012	2013	2011	2012	2013	2011	2012	2013		2011	2012	2013		2011	2012	2013		2011	2012	2013						
Enrichment	20.5	16.0	12.6	89.2	84.7	80.1	-9.0	1.5	2.3	3.1	1.6	84.5	81.1	77.7	-6.8	2.9	3.1	3.3	0.5								
Physical activity	56.6	61.4	70.5	65.6	57.1	48.7	-16.9	13.5	15.1	16.8	3.3	57.9	49.2	40.5	-17.4	16.9	18.6	20.4	3.5								
Free play	48.6	31.2	28.0	70.7	62.1	53.4	-17.3	8.5	15.1	16.2	7.7	61.8	51.8	39.6	-22.2	14.2	16.5	18.8	4.5								
Organized	40.5	48.9	56.0	72.0	55.2	48.3	-23.7	6.9	10.9	15.0	8.1	64.0	45.3	39.2	-24.8	12.2	15.4	18.5	6.4								
Swim/water	10.9	19.9	16.0	49.3	41.6	33.9	-15.4	36.8	41.3	50.4	13.6	48.3	40.9	33.4	-15.0	37.7	42.3	46.9	9.2								
Bathroom/changing ^b	13.2	9.6	8.7	83.8	79.0	74.1	-9.7	2.2	2.0	1.6	-0.6	80.3	76.9	73.4	-6.9	2.9	2.6	2.3	-0.6								
Assembly	6.0	3.6	4.2	80.6	71.3	62.1	-18.4	4.4	8.6	16.9	12.6	74.7	67.1	59.5	-15.1	5.1	8.6	12.0	6.9								
Other (devotions, transition)	3.7	9.5	4.1	85.2	85.1	85.1	-0.1	1.5	1.3	0.9	-0.7	87.6	81.0	87.2	-0.4	2.5	3.1	3.7	1.2								

Note: Percentages are adjusted means based on multilevel mixed effects linear and nonlinear regression nesting scans within groups of children, within sites. Statistically significant changes at $p < .05$ are in boldface.

Source: 12,803 SOSPAN and SOPLAY scans over ninety-eight program days in summer 2011, 2012, and 2013.

^aChanges represent differences between percent over time rather than percent change.

^bIncludes times when children were waiting for other children to use the bathroom.

Table 4.2. Girls' and boys' sedentary and MVPA time during scheduled physical activity by grade level

Grade	Girls						Boys									
	Percent sedentary			Percent in MVPA			Percent sedentary			Percent in MVPA						
	2011	2012	2013	Change ^d	2011	2012	2013	Change ^d	2011	2012	2013	Change ^d				
K-1	71.8	60.8	49.7	-22.1	14.7	18.6	22.6	7.9	67.5	57.3	47.2	-20.3	17.3	19.9	22.5	5.2
2-3	70.8	61.7	52.6	-18.3	13.3	16.6	20.0	6.7	69.0	58.4	47.8	-21.2	16.4	18.7	21.0	4.6
4-5	65.2	59.5	53.8	-11.5	24.3	21.7	19.0	-5.3	58.0	48.0	49.5	-8.5	20.2	27.9	21.3	1.3
Mixed	67.3	57.8	48.2	-19.1	14.6	18.3	21.9	7.2	61.1	50.4	39.8	-21.3	19.7	22.6	25.5	5.8

Note: Percentages are adjusted means based on multilevel mixed effects linear and nonlinear regression. Statistically significant changes at $p < .05$ are in boldface.

Source: 8,348 SOPLAY scans over ninety-eight program days in summer 2011, 2012, and 2013.

^aChanges represent differences between percent over time rather than percent change.

by grade level. The decrease in the percentage of girls who were sedentary ranged from 22.1 to 11.5 percent, while decreases for boys ranged from 21.3 to 8.5 percent. All changes in the percentages of girls and boys who were sedentary were statistically significant. Increases in the percentage of boys engaged in MVPA ranged from 1.3 to 5.8 percent, while changes for girls ranged from a 5.3 percent decrease to a 7.9 percent increase. All these changes in MVPA reached statistical significance except for the children in grades 4 and 5.

Changes in staff behaviors

Changes in staff behaviors are presented in Table 4.3. Of the thirteen staff behaviors charted in the SOS PAN observation tool, eleven changed in the desired direction. Of these eleven changes, nine reached statistical significance. All staff behaviors that promote children's PA changed in the desired direction at statistically significant levels. Changes ranged from an 11.4 percent increase in staff engaged in PA with children to a 2.1 percent increase in providing choice in PA opportunities. Staff engaging in PA with children and staff providing children a choice of PA opportunities showed decreases from baseline to the midpoint (of 25.4 percent and 20.4 percent, respectively) before increasing during the final year. Staff verbal promotion of PA showed accelerated increases between 2012 and 2013 (4.8 percent versus 10.9 percent) when compared to the increase from 2011 to 2012 (2.9 percent versus 4.8 percent).

Only three of the staff behaviors that discourage child PA demonstrated statistically significant changes in the desired direction: children waiting idly (−42.4 percent), staff withholding PA from children as a consequence of misbehavior (−1.1 percent), and children standing in line waiting for their turn (−4.0 percent). No other changes reached statistical significance. For children standing in line waiting for their turn, an initial decrease of 11.1 percent was observed between baseline and the midpoint of the study. However, from the midpoint to the final summer, an increase

Table 4.3. Changes in staff physical activity promotion behaviors during scheduled physical activity

	<i>Percent of scans during scheduled physical activity that included the staff behavior</i>			
	<i>Summer 2011</i>	<i>Summer 2012</i>	<i>Summer 2013</i>	<i>Change^a from baseline to final</i>
<i>Staff behavior that promotes physical activity</i>				
Staff leading or instructing physical activity	9.5	14.3	19.0	9.5
Staff verbally promoting physical activity	2.9	4.8	10.9	8.0
Staff engaged in physical activity with children (that is, playing the game)	25.4	20.4	36.8	11.4
Choice of activities provided	9.4	1.9	11.5	2.1
Small games with fewer than ten children participating	0.0	1.7	3.6	3.6
Girls-only physical activity opportunity	0.6	2.1	3.6	3.0
<i>Staff behavior that discourages physical activity</i>				
Staff verbally discouraging physical activity	2.3	1.3	2.0	-0.3
Staff withholding physical activity as a consequence of misbehavior	2.1	1.6	1.0	-1.1
Children standing in line and waiting for turn	18.9	7.8	14.9	-4.0
Playing elimination game (so that children are eliminated from PA opportunities)	8.5	7.0	5.5	-3.0
Staff giving instructions	10.9	11.4	11.9	1.0
Staff disciplining children	2.1	2.3	2.5	0.4
Idle time in which children wait for direction from staff and have no specific task	53.1	18.2	10.7	-42.4

Note: Percentages are adjusted means based on multilevel mixed effects linear and non-linear regression. Statistically significant changes at $p < .05$ are in boldface.

Source: 8,348 SOSPLAN scans over ninety-eight program days in summer 2011, 2012, and 2013.

^aChanges represent differences between percent over time rather than percent change.

of 7.1 percent was observed. For idle time, an initial decrease of 34.9 percent was observed from baseline to the midpoint, with a smaller but continued decrease of 7.5 percent from the midpoint to the final summer.

Discussion

While significant work has been done to assist YMCAs across the country with the adoption of the national YMCA PA Standards, this is one of the first studies to use systematic observation to evaluate an intervention to increase SDC staff's PA promotion and related changes in children's PA.²⁵ The research reported in this chapter allowed for the continued evaluation of changes in staff behaviors and child activity levels following the final summer of evaluation. Many staff behaviors moved in the desired direction during the three-year study and improved from the midpoint of the study to the final summer. A corresponding decrease in the percentage of children observed to be sedentary between intervention years 1 and 2 was also observed. Continued increases in the percentage of children engaged in MVPA were also observed during free play and organized PA. Taken together, these improvements across the three-year study indicate that the strategies developed and implemented in this study can lead to sizable changes in staff behaviors that are both theoretically and empirically linked to children's activity levels. These strategies, in turn, can be used to assist SDCs in meeting PA standards.

This intervention is different from previous interventions to promote PA. The mechanism for change in this study was a competency-based professional development training emphasizing building the skills of staff and program leaders so they could create a PA-supportive SDC. The skills covered in this training were readily applicable to the SDC program without changing any programmatic components. The strength of this approach is that the strategies are easily adaptable to each SDC's unique circumstances and needs. Staff were not asked to implement or deliver new activities, but rather were trained to integrate the LET US Play principles into the games they were already playing with children. The training continued to demonstrate effectiveness during the final intervention summer, as represented by the large increases in staff PA-supportive behavior and child activity levels compared to the midpoint summer. These findings illustrate that the adoption of PA

standards, coupled with the 5Ms training and LET US Play principles described here, can produce continued changes in staff behaviors and may be effective in aligning staff behaviors with those called for in the national YMCA PA Standards.

Changes in staff behaviors were accompanied by a reduction in the percentage of children who were sedentary and increases in the percentage of children who were engaged in MVPA. At the completion of the midpoint evaluation, the largest changes observed were in the percentage of children who were sedentary.²⁶ This trend continued to the final evaluation, with a statistically significant reduction in the percentage of children who were sedentary in five of the six kinds of scheduled PA opportunities. This finding is important because reducing children's sedentary time is emerging as a public health goal.²⁷

Reductions in the percentage of children who were sedentary were accompanied by increases in the percentage of children who were engaged in MVPA during free play, organized PA, and assembly. An increase in the percentage of girls engaged in MVPA was also observed during enrichment activities. The fact that staff were trained to institute short activity breaks during long periods of scheduled inactive time likely explains the changes in MVPA during these times.²⁸ Further, the smallest percentage of children who were sedentary and the largest percentage of children who were engaged in MVPA occurred during swimming and water activities. This finding is consistent with previous research that found increases in the percentage of children engaged in MVPA during water activities in SDCs.²⁹ Scheduling swim time or outdoor activities that include water in the form of water balloons, hoses, or sprinklers could be one strategy for programs to increase children's MVPA and decrease sedentary time during the summer heat.

At baseline, girls and boys were more engaged in MVPA during free play compared to organized PA opportunities. This finding, which is consistent with those of other studies, has led to a call for the integration of more free-play PA opportunities into after-school programs.³⁰ However, following the intervention, comparable percentages of boys and girls were engaged in MVPA during

free play and during organized PA opportunities. These findings suggest that some characteristics of organized activities may minimize PA. Training staff to modify organized PA to comply with the LET US Play principles can elicit at least as much MVPA during organized PA as during free-play opportunities.

The percentage of children observed to be sedentary decreased across all grade levels, while the percentage of children engaged in MVPA increased in all grade levels except grades 4 and 5. It is unclear why the percentage of children engaged in MVPA did not increase at this grade level. One explanation may be that, as children age, they become more intent on fitting into a social group of their peers than on pleasing adult supervisors, so that strategies that focus on increasing staff PA-supportive behaviors become less effective as children age.³¹ Thus, strategies to increase older children's engagement in MVPA need to be explored; the reduction in children's activity levels as they enter adolescence is well documented.³²

A diminished gap between girls' and boys' MVPA during free play and organized PA was observed at the conclusion of the first intervention summer.³³ This trend continued into the second intervention summer, with the percentage of girls engaged in MVPA increasing by 7.7 during free play and by 8.1 percent during organized PA, while the boys increased by 4.5 during free play and 6.4 percent during organized PA. It is widely accepted that girls are less active than boys; therefore, strategies that can minimize the gap between girls' and boys' PA levels are needed.³⁴ This study provides initial evidence that the LET US Play principles in concert with the 5Ms training model—including providing girls-only PA opportunities, engaging in PA with girls, and verbally encouraging PA—have the potential to fill that need.

The limitations of this study include a small number of SDCs and the lack of a control group. The four SDCs in which the intervention was evaluated may not be representative of all SDCs. Further, observed increases and decreases in staff behaviors may have occurred in the absence of the intervention due to history, selection bias, regression to the mean, or the "Hawthorne effect,"

meaning that staff changed their behavior because they were observed not because of the intervention. The lack of a control group does not allow us to confirm or refute that limitation. However, it is unlikely the magnitude of the changes observed were caused by anything other than the intervention, since most of the targeted staff behaviors changed in the desired directions and were accompanied by changes in child activity levels.

This study also has several strengths, including the use of a collaborative partnership to develop, implement, and test strategies, the amount of data collected using systematic observation, and two years of postintervention observations. A collaborative partnership between SDCs and the University of South Carolina led to the development of strategies that were both relevant to public health goals and feasible for SDC programs to achieve. Input from program leaders also ensured that the intervention was adaptable to the unique context of each program and, therefore, adoptable, enhancing the likelihood of changes to routine practice.³⁵ The nearly 13,000 scans completed in this study confirm that the data reported here are representative of the participant sites. Further, multiple observations allowed for the documentation of trends in staff behaviors and child activity levels over several time points.

In conclusion, study findings show that a competency-based professional development training may be effective at increasing PA-promoting and decreasing PA-discouraging staff behaviors and related child activity levels. Most changes in staff behaviors and child activity levels observed at the midpoint evaluation were sustained through a final year of intervention and evaluation. This finding suggests that continued support and training is necessary for staff and program leaders to sustain these changes. While this study has a limited sample size, the lessons learned may be broadly applicable to large-scale SDC program providers. For instance, programs may need to implement ongoing training and evaluation if they are to continue to meet the PA Standards. However, further studies are needed to confirm and build upon these findings.

Notes

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