Published in final edited form as:

J Phys Act Health. 2014 August ; 11(6): 1170–1178. doi:10.1123/jpah.2012-0442.

A Coordinated Comprehensive Professional Development Training's Effect on Summer Day Camp Staff Healthy Eating and Physical Activity Promoting Behaviors

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Abstract

Background—The YMCA of USA recently adopted Healthy Eating and Physical Activity (HEPA) Standards for their summer-day-camps (SDCs). Standards call for staff to exhibit HEPA promoting behaviors while eliminating HEPA discouraging behaviors. No studies have evaluated training programs to influence policy specified staff behaviors and related changes in child activity in SDCs.

Method—Four YMCA summer-day-camps serving approximately 800 children per week participated in this no control group pre/post pilot study. Professional development training founded in the 5Ms (Mission, Model, Manage, Monitor, Maximize) and LET US Play principles (lines, elimination, team size, uninvolved staff/kids, and space, equipment and rules) was delivered to staff. Outcomes were staff promotion behaviors and child activity assessed via systematic observation instruments.

Results—Twelve of 17 HEPA staff behaviors changed in the appropriate direction from baseline to post-assessment with five behaviors reaching statistically significant changes. The percentage of girls and boys observed in moderate-to-vigorous-physical-activity increased from 15.3% to 18.3% ($p > .05$) and 17.9% to 21.2% whereas sedentary behavior decreased from 66.8% to 59.8% and 62.3% to 53.6%, respectively.

Conclusion—Evidence suggests that the professional development training designed to assist SDCs to meet the HEPA Standards can lead to important changes in staff behaviors and children's physical activity.

Keywords

Intervention; obesity; policy; summer day camp; children

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The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Heart, Lung, And Blood Institute or the National Institutes of Health.

Potential conflicts of interest: None

Introduction

Summer Day Camps (SDCs) have been recognized as a setting, outside of the school year, that can impact the healthy eating and physical activity (HEPA) of children. With more than 5,000 camps in operation across the nation ¹ and 14.3 million children in attendance annually ² SDCs have substantial reach. Moreover, body mass index gains are greater over the summer than during the school year, ^{3,4} making summer a crucial time to intervene on children's HEPA. Initial research indicates children are not sufficiently active while attending SDCs, ^{5,6} while the quality of foods consumed by both staff and children at SDCs is currently unknown. These findings suggest that SDCs have unrealized potential to affect the HEPA of millions of children in attendance annually.

Recently, one of the largest SDC providers in the United States, the YMCA of America, adopted HEPA Standards to address children's inactivity and the quality of foods in their SDCs. ⁷ These standards focus on the amount of physical activity children should accumulate while attending (i.e. 60 minutes daily) and the quality of foods/beverages children should bring to the program (e.g., eliminate sugar sweetened beverages and bring fruits or vegetables daily). In addition to child outcomes, the HEPA Standards outline the behaviors staff should display, which are theoretically and empirically linked to promoting child HEPA (e.g., role modeling HEPA, verbally encouraging HEPA), as well as behaviors staff should avoid such as: eating unhealthy foods in front of children and withholding physical activity as punishment. ⁷ However, HEPA Standards fall short of highlighting the strategies SDCs can use to increase appropriate staff behaviors and eliminate inappropriate staff behaviors. Therefore, SDC program leaders and staff need support to help staff meet HEPA Standards.

Standards for the SDC setting grew from attempts to implement standards in afterschool programs related to children's HEPA and staff behaviors ⁸. These standards were informed by studies attempting to intervene on children's HEPA in the school and afterschool setting ⁹⁻¹⁵. However, these studies have produced limited and mixed results. One of the weaknesses of previous studies is their reliance upon the delivery of an intervention, with little flexibility to adapt to local conditions. Staff members are often trained to deliver a pre-packaged program ^{12,13,16} leaving little room for adaption to individual school and afterschool program needs, a key component to increasing the intended outcomes of interventions ^{17,18}.

To date we are aware of no studies that have evaluated the effect of an intervention on staff HEPA promoting or discouraging behaviors in SDCs and the related changes in child activity levels. Consequently, little is known about effective intervention strategies for aligning staff behaviors with HEPA Standards in the SDC setting. Further, by providing staff with competency based training that focuses on demonstrating behaviors rather than implementing a pre-packaged program, we hypothesize that the program will be more adaptable and experience greater outcomes. The purpose of this study was to describe the development and first year outcome evaluation of competency-based professional development training ¹⁹ on staff engagement in HEPA promoting behaviors in SDCs.

Additionally, this study evaluated the impact of the professional development training on children's activity levels in the participant SDCs.

Methods

Setting and Participants

The results in this paper represent the first year findings of a two year intervention and evaluation cycle using a no control group pre/multiple-post assessment design related to staff behaviors and child activity levels. Child level nutrition findings are reported elsewhere.²⁰ Due to the observational nature of the data collection, passive consent was obtained from the parents of the children in attendance and the staff employed by the SDCs. All procedures were reviewed and approved by the university's institutional review board.

Four large scale YMCA SDCs in the Columbia, SC area took part in this study. These SDCs each serve approximately 200 children per day and employed around 300 staff across the two measurement periods. The SDCs participating were structured programs that provided a variety of activities (e.g. snack/lunch, enrichment, physical activity) daily throughout the summer.^{1,2} Activities included free-play opportunities; organized games, such as sports and tag games; water-based activities such as swimming, playing at a water park, or splash pad (i.e. concrete pad with fountains, water guns and water based play structures); and enrichment activities, such as arts and crafts.

Each SDC employed a site leader and staff members. Site leaders created daily schedules, managed staff, interacted with parents and generally oversaw program operations. Staff's main responsibility was to manage children as they moved through the planned activities each day. Scheduled activities at the SDCs were held from 9am to 4:30pm. Participant SDCs operated on an 11-week schedule throughout the summer with parents enrolling their children in camp for one week (Monday through Friday) at a time. The camps maintained a 1:10 staff-to-child ratio and grouped children by grade level (e.g. k-1st, 2nd-3rd and 4-5th). Grade levels were divided into smaller groups of children with one to staff member responsible for 10-15 children each. For example, there could be 4 groups of 4-5th graders each with 10 to 15 children. Most of the children were under 12 years of age and were enrolled in the program for 8 weeks during the summer. Enrolled children attended the program on average 4 days a week for 8 hours each day.

The average daily low and high temperatures during data collection were 76.5 °F (range 70 to 82.4 °F) and 95 °F (range 84.9 to 102 °F) at baseline and 76.3 °F (range 71.1 °F to 82.9 °F) and 93.2 °F (range 86 to 102.9 °F) at post-assessment.

Intervention

Professional development training—The primary strategy for increasing staff engagement in HEPA promoting behaviors was professional development training. All trainings were led by university personnel; each training lasted about 1.5 hours. The professional development training was grounded in the 5Ms training model—Mission, Manage, Motivate, Monitor, Maximize¹⁹ which focuses on core competencies consistent with theory,^{21,22} “best practices” position statements from elementary and middle school

physical education,^{23,24} literature on competencies for school wide and out of school time physical activity promotion,^{11,25–27} policy documents,^{7,28–30} and our substantial experience working with SDCs. These principles were communicated to staff via the catchphrase, “LET US Play.” LET US is an acronym for lines, elimination, team size, uninvolved staff/kids, and space, equipment and rules. The trainings emphasized LET US Play as a reflective tool for staff to identify barriers to children’s activity during free-play and organized activities. Staff also practiced competencies related to managing children in physical activity environments (e.g. using countdowns to transition between activities quickly, actively supervising children, keeping all children in view) in order to reduce idle-time (i.e. when children wait for direction from staff) and time spent instructing and disciplining children. The healthy eating components of the professional development training included role modeling and promoting healthy eating and using healthy eating resources (i.e. coloring sheets, crossword puzzles etc.) for nutrition education.

On-site booster trainings—Six training “booster” sessions were conducted at each SDC. Bi-weekly booster sessions occurred immediately following the SDC program and lasted approximately one hour each. Boosters were conducted by the lead author and consisted of participatory activities designed to provide site leaders and staff with PA planning resources, reinforce HEPA promotion strategies, demonstrate appropriate management of children during scheduled physical activity time, and reinforce principles LET US Play covered in the 5Ms trainings.

Workshop – Schedule Modification—A lack of detailed schedules was identified by university personnel and YMCA site leaders as one of the barriers to quickly moving through scheduled activities in the SDC during following baseline data collection. Schedules created by the participant SDCs initially listed only general activities (i.e. enrichment, field games) and did not indicate location, equipment needed or staff roles within the activity to be played. This led to extended times of child inactivity (approximately 10–15min) while staff chose the specific activity, organized children, and retrieved and set up necessary equipment for the activity. Prior to post-assessment program leaders attended a workshop about creating schedules with specific activities, activity location, equipment needed, and staff roles during these activities.

Weekly feedback—During post-assessment evaluation, site leaders and staff received feedback twice per week. Observation notes from the evaluation team were compiled and emailed to site leaders for dissemination to staff. Feedback focused on modifying games, effective management of children during physical activities, and staff HEPA modeling and encouragement. Feedback was aligned with the 5Ms model and the LET US Play principles.

Weekly self-evaluation—A checklist consistent with the HEPA Standards was developed and distributed to site leaders. Initial checklists were completed at each SDC by university personnel and site leaders in order to clarify definitions of items and explain procedures for completing checklists. Subsequent checklists were utilized as a self-evaluation tool to identify appropriate and inappropriate staff behaviors and collected by the lead author as a process evaluation measure.

Instrumentation

System for observing staff promotion of activity and nutrition (SOSPAN)—

Staff HEPA promotion behaviors were collected via direct observation. The SOSPAN instrument is a systematic observation instrument that utilizes momentary time sampling and measures staff HEPA promotion behaviors consistent with HEPA standards. SOSPAN captures 17 staff behaviors (13 physical activity promotion behaviors and 4 healthy eating promotion behaviors) and has been validated and found reliable³¹ in the SDC setting. The instrument is divided into three subsections, including staff management behaviors, staff promotion behaviors, and ASP context. Staff management behaviors (n=7) include contextual factors of the activity (e.g. children eliminated from physical activity opportunities, children standing and waiting in line for their turn, unsafe food handling) over which frontline-staff have direct control. Staff promotion behaviors (n=10) include behaviors that staff performed during observation (e.g. engaging in physical activity with children, verbally promoting HEPA, educating children about healthy eating). ASP context includes scheduled activity and activity location.

Systematic observation of physical and leisure activity in youth (SOPLAY)—

Child physical activity levels were collected via SOPLAY³² concurrently with staff behaviors. Utilizing momentary time sampling, SOPLAY captures activity levels (i.e. sedentary, walking, vigorous) of large groups of children. Prior research has used the activity codes captured by SOPLAY extensively,^{32–35} Construct validity of the activity codes has been established through heart rate monitors³⁶ and accelerometry.³⁷ Consistent with previous research,³⁷ the vigorous activity level of the SOPLAY instrument was considered moderate-to-vigorous-physical-activity (MVPA) for this study.

Observation Schedule and Protocol—Baseline data were collected over 28 program days, whereas first year outcome data were collected over 39 program days. Observation occurred on unannounced nonconsecutive weekdays (Mon-Thurs) at each site throughout June, July and August 2011 (baseline) and July and August 2012 (outcome). Alternating SOPLAY and SOSPAN scans were completed continuously from the beginning to the end of each program day (i.e., scan sequence: SOPLAY, SOSPAN, SOPLAY, SOSPAN). Number of target areas (e.g., pools, fields, gyms, playgrounds) at individual sites ranged from 17–28, with 91 target areas identified across the four SDCs. Size, boundaries, and locations of target areas were identified prior to data collection in the Summer of 2011.³²

On observation days, trained observers arrived unannounced before the program began and followed a randomly selected group of children within a pre-selected grade-level. Grade levels were systematically selected prior to the site visit in order to ensure at least 75% of the groups within grade levels were observed and that each grade level was observed on at least 4 program days across both measurement occasions (i.e., pre- and post-assessment). This protocol led to an increased number of observation days at post-assessment because the number of children attending the SDCs grew from serving approximately 500 to 800 children daily. The randomly selected groups of children and staff were followed throughout the 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 (i.e. 9am), and were made continuously (i.e., one-after-the-other) until the end (i.e. 4:30p.m.) of the SDC program. Observers took two 15-minute breaks and one 30-minute lunch break during the day. Lunch breaks did not overlap scheduled lunch for children to ensure staff promotion behaviors for healthy eating could be observed during this time. Scans started when the target group entered a target area and suspended while the target group moved to a new target area (i.e., transitions between target are took between two to five minutes). Across pre- and post-assessment, the same time of day was observed across all days (i.e., 9am to 4:30pm) for all groups of children.

Observer Training and SOSPAN/SOPLAY Reliability—Eleven trained observers completed all observations (i.e. 4 per site per observation day). The lead author conducted observer training prior to baseline and post-assessment data collection. Observers completed classroom training, video analysis, and field practice. Classroom training lasted two days (i.e. 6 hrs each day) and included a review of study protocol, an orientation to the instrument, and observers committing observational categories and codes to memory. Observers completed at least six days (i.e. 3 hours each day) of field practice including familiarization with target areas at program sites and completing practice/reliability scans. Inter-rater agreement criteria were set at >80% using interval-by-interval agreement for each category.^{32,38} Consistent with published reliability protocols,^{38,39} reliability was collected prior to measurement and on at least 30% of measurement days during baseline and post-assessment data collection.

Reliability for SOSPAN and SOPLAY was collected over 31 days across all four participant SDCs. Estimates are based upon 1384 reliability scans across baseline and post-assessment. Reliability for SOSPAN and SOPALY were estimated via interval-by-interval intraclass correlations (ICCs) and percent agreement, where appropriate. Percent agreement between observers for SOSPAN behaviors ranged from 77.3% to 99.8%. “Staff engaged in other tasks” was the only variable where observers did not achieve the >80% agreement threshold (77.3%); consistent with previous research, it was still deemed acceptable agreement.³¹ Further, staff “verbally promoting healthy eating” and “verbally educating children about healthy eating” were never observed during reliability scans. However, since neither observer coded these behaviors, the definitions for the behaviors were considered acceptable. Further, the large number of reliability scans (i.e. 1384 over 31 days) suggests that these behaviors were so rare that further reliability scans would not have yielded more observations of these two variables. ICCs for SOPLAY categories ranged from 0.88 to 0.98.

Data Analysis

All statistical analysis was completed using Stata (v.12.0., College Station, TX). Changes in child the percent of children observed in MVPA and sedentary and staff behaviors were examined using multilevel mixed effects linear regression models with scans nested within days nested within ASP sites. Intervention effects were modeled at the site level. Child activity levels were expressed as the percentage of children engaged in sedentary behavior or MVPA in each SOPLAY scan. Staff behaviors were expressed as a percentage of total scans a behavior was observed. Primary outcome models were estimated for girls’ and boys’ activity levels, separately. Secondary models were estimated for girls and boys by grade

level, separately. Logistic regression models were also estimated to evaluate the odds of observing a staff behavior at post-assessment compared to baseline. Models for child activity levels were estimated exclusively for scheduled physical activity time because that is the time that HEPA Standards target child activity levels. Models for staff behaviors were estimated including only those scans that were performed during scheduled snack or physical activity time because that is when staff had the greatest opportunity to display HEPA promoting or discouraging behaviors. Also, HEPA Standards call for certain staff behaviors to happen daily/weekly (i.e., staff should promote nutrition daily and deliver nutrition education weekly) or during the entire program day (i.e., staff refrain from eating or drinking inappropriate foods in front of children). Therefore, these variables were converted into the percentage of days in which the behavior was observed.

Results

Over the two measurement periods 10,509 SOSPLAN and 8,528 SOPLAY scans were completed. A total of 8,528 SOSPLAN physical activity promotion scans were completed during all times except snack or lunch and 1,981 SOSPLAN nutrition promotion scans were completed during scheduled snack and lunch. Observers completed 4,938 SOSPLAN and SOPLAY scans during scheduled physical activity. These scans represent 1,645 girls and 1,838 boys activity days (i.e. children could have been observed on more than one day) across baseline and post-assessment.

Checklists

A total of 48 checklists were completed representing 65.9 percent of the SDC program weeks. One site leader submitted checklists representing all 11 program weeks (21 total checklists were completed with multiple checklists completed every program week) while one SDC program submitted checklists representing 5 program weeks (i.e. five total checklists completed) and another site leader complete checklists representing 6 program weeks (i.e. six total checklists). The final site leader completed checklists during seven of the 11 program weeks for a total of 16 checklists.

Changes in the percentage of children in MVPA and sedentary

Unadjusted means of the percentage of sedentary children and children engaged in MVPA across scheduled activities are presented in Table 1. Table 2 presents the linear regression model estimates of changes in MVPA and sedentary behaviors for boys and girls during scheduled physical activity time. Overall, there was an 8.7% and 7.0% reduction in percent of boys and girls observed sedentary, respectively. The largest reduction in the percent of children observed sedentary was during organized activity, with an approximate 11.5% and 10.4% reduction for boys and girls, respectively. Conversely, increases in the percent of children engaged in MVPA were seen for boys during overall physical activity opportunities (+3.3%), while the percent of girls in MVPA increased during organized activities (+4.5%).

Figure 1 and 2 present changes from baseline to post-assessment, by grade level, in the percent of boys and girls sedentary and engaged in MVPA, based on the linear regression models. Changes in the percent of boys engaged in MVPA ranged from a 6.2 percent

increase to a 3.5 percent increase, while changes for girls ranged from a 7.6 percent increase to a -0.1 percent decrease. Changes in the percent of boys observed sedentary range from an 11.6 percent decrease to a 6.9 percent decrease, while changes for girls ranged from 12.0 percent decrease to a 4.2 percent decrease. Not all changes reached statistical significance (see Figure 1 and 2).

Changes in staff behaviors

At baseline, 2 of the 17 staff behaviors (i.e., “staff verbally promoting healthy eating” and “staff verbally educating children about healthy eating”) were not observed (see Table 3). For these behaviors, logit and linear models were not estimated and unadjusted means are presented instead. Of the 17 staff behaviors observed, 12 moved in the desired direction, including behaviors that were not observed at baseline but were observed at post-assessment. Significant changes from baseline to post-assessment were observed in 4 staff behaviors (i.e., “staff engaged in other tasks,” “staff leading or instructing physical activity,” “staff engaged in physical activity with children,” and “children engaged in idle time”). Changes in staff behaviors that promote or discourage child physical activity ranged from a 39.4% decrease in child idle time to an 11.2% increase in staff engaging in other program duties (i.e., setting up for activities, taking children to bathroom/water). Odds of observing staff behaviors that promote or discourage child physical activity at post-assessment compared to baseline ranged from 3.33 times as likely to 0.24 times as likely.

Staff verbally promoting healthy eating was observed on 50% of days at post-assessment, whereas it was not observed at baseline. Staff verbally educating children about healthy eating was observed on 34.1% of evaluation days at post-assessment while it was never observed at baseline. Staff consuming inappropriate foods and drinks was observed on 8.2% and 8.3% fewer observation days at post-assessment compared to baseline, although these changes were not statistically significant. Staff were also 0.71 and 0.67 times less likely to be observed eating or drinking inappropriate foods in front of children at post-assessment.

Discussion

This is the first study to evaluate a professional development training’s effect on HEPA promoting behaviors and decreases in HEPA discouraging behaviors of staff in the SDC setting. Additionally, this is the first study to evaluate an intervention on children’s physical activity in SDCs. We observed statistically significant and positive changes in HEPA promoting/discouraging staff behaviors and increases in the percent of children physically active along with reductions in the percent of children sedentary. Although additional work is necessary, these findings represent a first step toward creating HEPA friendly environments within SDCs.

Unlike previous interventions in the school and afterschool program setting,^{12,13,40,41} this intervention delivered ongoing professional development training focused on providing staff competencies related to promoting child HEPA. This training appears to be effective at increasing desired and reducing less than desirable staff behaviors identified in HEPA standards. Two of the largest increases were seen in the amount of days staff promoted and educated children about healthy eating and the reduction of the number of days they ate or

drank unhealthy foods in front of children. HEPA standards specifically call for staff to display or eliminate these behaviors in order to create a health enhancing SDC environment for children. Staff training and education in concert with adopting standards related to role modeling appropriate behaviors (i.e. the HEPA Standards adopted by the YMCA of America) appears to be an effective strategy for increasing staff healthy eating promotion behaviors.

Changes in 12 of the 17 staff HEPA promotion behaviors were observed in the desired direction from baseline to post-assessment. While additional work may be needed to reach higher levels of these behaviors, this study is among the first to show that staff HEPA promotion behaviors can be altered by professional development training, onsite booster sessions and feedback. Further, these changes occurred within only 3 months of contact. While the majority of the staff behaviors moved in the desired direction two staff behaviors did not. One physical activity discouraging behavior (i.e. “staff engaged in other tasks”) increased, whereas one physical activity encouraging behavior (i.e. “staff engaging in activity with children”) decreased from baseline to post-assessment. It is unclear why these behaviors changed in undesired directions, particularly since staff engagement with children during activity opportunities was emphasized during initial and follow-up booster trainings as one of the components of LET US Play. A possible explanation for these findings is that staff were leading modified activities that aligned with the LET US Play principles more often at post-assessment. These games may have involved more set-up and may have involved more instruction because of the novelty of the games. Setting-up activity spaces before beginning activities and encouraging staff to work together (e.g. one staff member leads and presents games while the other participates) may be two strategies to address these issues in the future.

Recent research in the afterschool program setting has confirmed that staff engaging in activity with children and verbally promoting physical activity is related to increases in child MVPA and decreases in the number of children sedentary.⁴² Therefore, it is not surprising that, along with changing staff behaviors related to promoting physical activity, there was a corresponding increase in children engaged in MVPA and decrease in sedentary behaviors. The strategies adopted in this intervention (i.e., Physical Activity Standards, training and feedback for program leaders and staff), while not directly targeting child physical activity, appear to have increased children’s engagement in MVPA and decreased the percentage of sedentary children.

Moreover, this intervention appears to be most effective at reducing the percentage of children sedentary and increasing the percentage of children in MVPA during organized activities. For boys, changes in the percent of children in MVPA and sedentary were consistent across grade levels. For girls, changes in the percent of children in MVPA and sedentary fluctuated across grade levels, with the greatest changes for the 2nd and 3rd grade girls. It is well established that girls are less active than boys.⁴³ However, at post-assessment, increases in the percentage of girls’ engaged in MVPA were twice as much as the increase in boys observed in MVPA during organized activity, thereby minimizing the gap between girls and boys observed in MVPA during organized activities. Therefore, the strategies used in this intervention seem to be particularly promising for increasing the

percentage of girls' in MVPA during organized activities in SDCs. At post-assessment, substantially fewer children were observed sedentary. As decreasing child sedentary behaviors gains footing as a public health goal,⁴⁴ strategies used in this intervention may be essential for reducing sedentary behavior in the SDC setting. Further SDCs have tremendous potential for impacting children's activity levels during the summer where unhealthy behaviors may lead to accelerated body mass index gains.^{3,4}

This study has several strengths. The collaborative partnership between university and SDC personnel led to the adoption and evaluation of HEPA standards in existing programs, which promoted the use of practices that are feasible and relevant within current constraints. This, in turn, helped to ensure that the intervention was adaptable to the unique context of each program and, therefore, adoptable, which can lead to large scale changes to routine practice.⁴⁵ The large number of scans completed is another strength of this study. We are confident that these data are a comprehensive view of HEPA promoting/discouraging staff behaviors displayed and the percent of children sedentary and engaged in MVPA in the SDCs evaluated. This study also has limitations. The intervention was evaluated in only 4 SDCs, which may not be representative of all SDCs (i.e. external validity). The lack of a control group also raises the concern that increases or decreases in staff behaviors may have occurred in the absence of the intervention (i.e. internal validity) due to history, selection bias, regression to the mean, and/or the "Hawthorne effect." However, the changes in the majority of the behaviors in the desired directions along with corresponding changes in the percent of children active make it unlikely that these changes were caused by anything other than the intervention.

In conclusion, this study is the first to develop and evaluate strategies to create health-enhancing SDC environments. Corresponding changes in staff HEPA promoting/discouraging behaviors, a reduction in the percent of children sedentary, and an increase in percent of children engaged in MVPA were observed from baseline to post-assessment. This evidence suggests that the adoption and implementation of HEPA Standards and the collaborative effort of community and university staff to create HEPA promoting strategies to meet these standards can lead to positive changes in staff behaviors and children's physical activity.

Acknowledgments

The project described was supported by Award Number R21HL106020 from the National Heart, Lung, And Blood Institute.

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Figure 1. Changes in the percent of boys observed in MVPA and sedentary from baseline to post-assessment.

Figure 2.
Changes in the percent of girls observed in MVPA and sedentary from baseline to post-assessment.

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Percentages are unadjusted means

3483 child days (girls = 1645) observed across baseline and post-assessment

Table 2
Changes in the Percentage of Boys and Girls Observed Sedentary and in MVPA during Scheduled Physical Activity Time

Scheduled Activity	Boys					Girls				
	Sedentary			MVPA		Sedentary			MVPA	
	2011	2012	95% CI	2011	2012	2011	2012	95% CI	2011	2012
Physical Activity	62.3	53.6	-8.7	(-12.6, -4.8)	17.9	21.2	3.3	(0.0, 6.6)	66.8	59.8
Free play	55.4	50.6	-4.8	(-10.2, 0.7)	18.1	18.6	0.6	(-4.0, 5.1)	63.9	61.6
Organized Activity (e.g. sport, game, dance)	72.3	60.8	-11.5	(-17.2, -5.8)	10.2	12.6	2.4	(-0.7, 5.4)	76.9	66.5
Swimming or water activity (e.g. pool, waterpark)	49.3	41.3	-8.0	(-15.2, -0.8)	39.1	42.2	3.0	(-6.2, 12.2)	48.3	43.8
									40.9	39.5
										-1.5
										(-10.1, 7.2)

Statistically significant changes are bolded

Based on 4,938 scans over 67 days

3483 child days (girls = 1645) observed across baseline and post-assessment

Table 3
Increases and Decreases of Staff Healthy Eating and Physical Activity Promotion Behaviors from Baseline to Post-assessment

Staff Behavior ^a	Percent of scans observed during scheduled PA/snack time					Odds post intervention ^d	95% CI	95% CI
	Summer 2011	Summer 2012	Percent Change					
Staff engaged in other tasks	7.4	18.6	11.2	(6.6, 15.9)		2.79	(1.84, 4.24)	
Staff leading or instructing physical activity	6.6	16.8	10.2	(5.6, 14.9)		3.33	(1.94, 5.73)	
Staff verbally promoting physical activity	3.2	5.2	2.0	(-0.1, 4.1)		1.75	(0.97, 3.14)	
Staff verbally discouraging physical activity	2.0	1.3	-0.7	(-1.6, 0.2)		0.64	(0.35, 1.16)	
Frontline staff engaged in physical activity with children (i.e. playing the game)	31.8	21.0	-10.8	(-17.2, -4.4)		0.54	(0.37, 0.80)	
Withholding physical activity as a consequence of misbehavior	2.3	1.8	-0.5	(-2.0, 1.0)		0.79	(0.37, 1.70)	
Staff Management of PA^a								
Children standing in line and waiting for turn	26.9	5.6	-21.3	(-27.0, -15.6)		0.14	(0.08, 0.27)	
Playing elimination game (i.e. children eliminated from PA opportunities)	10.9	7.4	-3.4	(-7.8, 0.9)		0.61	(0.28, 1.33)	
Frontline staff giving instructions	9.5	12.3	2.9	(-0.5, 6.2)		1.39	(0.98, 1.99)	
Frontline staff disciplining children	1.7	3.1	1.4	(-0.1, 2.8)		1.73	(0.86, 3.48)	
Idle time (i.e. children waiting for direction from staff with no specific task)	56.0	16.6	-39.4	(-47.3, -31.4)		0.12	(0.07, 0.19)	
Choice provided (i.e. more than one activity opportunity provided)	5.7	3.8	-1.9	(-5.6, 1.9)		0.50	(0.12, 2.19)	
Small game (i.e. games with less than 10 children participating)	0.5	1.8	1.3	(-0.1, 2.7)		4.91	(0.92, 26.21)	
Healthy Eating Staff Behaviors								
Staff verbally promoting healthy eating ^{c,e}	0.0	50.0	50.0	--		-	--	
Staff verbally educating children about healthy eating ^{c,e}	0.0	34.1	34.1	--		-	--	
Staff eating inappropriate foods ^{b,e}	55.9	47.7	-8.2	(-32.4, 16.0)		0.71	(0.25, 1.98)	
Staff drinking other than water ^{b,e}	33.3	25.0	-8.3	(-30.8, 14.1)		0.67	(0.22, 2.00)	

Bolded numbers are statistically significant changes at $p = 0.05$

^a During Scheduled PA (n = 4938)

^b During all times except scheduled snack or lunch time (n = 8,528)

^c 1,981 scans completed during scheduled snack

^d Odds ratios derived from multilevel mixed effects logit regression models (e.g. odds of observing staff engaged in other duties at post-assessment are 2.79 times more likely than at baseline)

Presented as a percentage of days that the behavior was observed_e

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