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Evaluation of a multi-year policy-focused intervention to increase physical activity and related behaviors in lower-resourced early care and education settings: *Active Early* 2.0

Emily J. Tomayko[a,*], Ronald J. Prince[b], Jill Hoiting[c], Abbe Braun[c], Tara L. LaRowe[d], Alexandra K. Adams[b]

[a] *Nutrition, School of Biological and Population Health Sciences, College of Public Health and Human Sciences, Oregon State University, Corvallis, OR 97331, United States*
[b] *Department of Family Medicine and Community Health, School of Medicine and Public Health, University of Wisconsin, Madison, WI 53715, United States*
[c] *Supporting Families Together Association, Madison, WI 53711, United States*
[d] *Department of Nutritional Sciences, College of Agricultural and Life Sciences, University of Wisconsin, Madison, WI 53715, United States*

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ABSTRACT

Physical activity is a critical component of obesity prevention, but few interventions targeting early childhood have been described. The *Active Early* guide was designed to increase physical activity in early care and education (ECE) settings. The purpose of *Active Early* 2.0 was to evaluate the effectiveness of *Active Early* along with provider training, microgrant support, and technical assistance over 2 years (2012–2014) to increase physical activity and related behaviors (e.g., nutrition) in settings serving a high proportion of children from underserved groups in recognition of significant disparities in obesity and challenges meeting physical activity recommendations in low-resource settings. The physical activity and nutrition environment were assessed before and after the intervention in 15 ECE settings in Wisconsin using the Environment and Policy Observation Assessment tool, and interviews were conducted with providers and technical consultants. There was no significant change in Total Physical Activity Score or any EPAO subscale over the intervention period; however, significant improvements in the Total Nutrition Score and the several Nutrition subscales were observed. Additionally, the percentage of sites with written activity policies significantly increased. Overall minutes of teacher-led physical activity increased to 61.5 ± 29.0 min ($p < 0.05$). Interviews identified key benefits to children (i.e., more energy, better rest, improved behavior) and significant barriers, most notably care provider and child turnover and low parent engagement. Moderate policy and environmental improvements in physical activity and nutrition were achieved with this intervention, but more work is needed to understand and address barriers and to support sustained changes in lower-resource ECE settings.

1. Introduction

Significant disparities in childhood obesity prevalence and risk factors have been identified for some racial/ethnic minority groups and children from low-income backgrounds, among other risk factors. (Dixon et al., 2012; Datar and Chung, 2015; Ogden et al., 2016) Evidence suggests these disparities are present by the preschool years, (Woo Baidal et al., 2016; Taveras et al., 2013) highlighting the importance of the early life experiences for child health. In the US, approximately one quarter of children younger than age 5 are in some form of organized child care, including nearly three quarters of young children with working mothers.(Laughlin, 2013) Organized child care includes regulated home-based and center-based care, collectively referred to as early care and education [ECE] settings. With children spending an average of 36 h per week in care outside the home, these ECE settings represent important venues for the development of healthy behaviors. Diet and physical activity are known to be significant contributors to obesity, and early childhood years are a critical period for the development of food preferences, motor skills, and physical activity habits.(Skinner et al., 2002; Loprinzi et al., 2015) In recognition of this opportunity, the Institute of Medicine in 2012 identified increasing physical activity in child care settings as a key strategy for accelerating progress in obesity prevention.(Institute of Medicine, 2012) However, limited available data suggest few sites are meeting recommended

* Corresponding author.
E-mail address: emily.tomayko@oregonstate.edu (E.J. Tomayko).

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Table 1
Active Early 2.0 site demographics overall and by site type at baseline.

	Home-based (n = 7 sites, 35 children)	Center-based (n = 8 sites, 465 children)	All (n = 15 sites, 500 children)	p-Value
Staff, mean ± SD (range)	1.3 ± 0.5 (1–2)	14.5 ± 6.4	8.3 (1 − 23)	< 0.0001
% female	100.0 ± 0.0	96.2 ± 4.3	98.0 ± 3.6	< 0.05
Teacher education, %				
High school	28.6%	15.8%	21.7%	0.50
Trade school	14.3%	15.2%	14.8%	0.96
Some college	57.1%	39.5%	47.7%	0.41
Bachelor's degree	0.0%	27.5%	14.7%	< 0.01
Graduate school	0.0%	2.1%	1.1%	0.21
Teacher age, %				
18–25 years	0.0%	14.5%	7.7%	< 0.05
26–40 years	35.7%	46.9%	41.7%	0.56
41–55 years	42.9%	32.0%	37.1%	0.59
> 55 years	21.4%	6.7%	13.5%	0.31
Teacher race/ethnicity, %				
Asian	28.6%	4.1%	15.5%	0.18
Black	0.0%	20.2%	10.8%	0.10
White	42.9%	55.7%	49.7%	0.58
Hispanic	28.6%	5.0%	16.0%	0.20
American Indian	0.0%	14.2%	7.6%	0.20
Multi/Other	0.0%	1.6%	0.8%	0.19
Enrolled children, mean ± SD (range)	5.0 ± 2.5 (2–8)	58.1 ± 52.6 (5–166)	33.3 ± 46.3 (2–166)	< 0.05
Asian	28.6%	3.1%	15.0%	0.16
Black	11.2%	32.6%	22.6%	0.14
White	21.2%	26.0%	23.7%	0.76
Hispanic	24.8%	6.8%	15.2%	0.21
American Indian	14.3%	25.7%	20.4%	0.61
Multi/Other	0.0%	5.8%	3.1%	0.14
Participation in CACFP (yes)	100%	87.5%	93.3%	0.33

CACFP, Child and Adult Care Food Program; SD, standard deviation. All sites were located in Wisconsin, and measurements were made from 2012 to 2014.

levels of physical activity for children.(Tandon et al., 2015; Tandon et al., 2012; Cardon et al., 2008; Dowda et al., 2004; Pate et al., 2004)

Interventions have been successfully developed to increase physical activity in ECE settings, (,(Goldfield et al., 2016) reviewed in(Ward et al., 2010)) although some have yielded mixed results.(Bonvin et al., 2013; Campbell and Hesketh, 2007; Mehtala et al., 2014; Alhassan and Whitt-Glover, 2014) Moreover, few interventions have addressed these types of settings serving children who may be at greater risk for obesity and other adverse health outcomes.(Skouteris et al., 2011; Wolfenden et al., 2016) To address the significant problem of childhood obesity in Wisconsin, a statewide partnership developed the *Active Early* guide to target increasing physical activity opportunities in ECE settings. We previously demonstrated the benefits of the *Active Early* guide for improving structured physical activity in ECE settings in Wisconsin. (LaRowe et al., 2016) However, these settings tended to be higher-resource, and it was unknown if this curriculum could be successful in sites serving a high proportion of children from diverse backgrounds and of low socioeconomic status. The aim of *Active Early* 2.0 was to evaluate the *Active Early* guide in combination with technical support and microgrant assistance in ECE settings serving a high proportion of children from families of lower socioeconomic status and who are Latino, African American, American Indian, and Hmong in recognition of the significant disparities in overweight and obesity experienced by these groups and the challenges of meeting physical activity recommendations in low-resource settings.

2. Methods

2.1. Pilot site recruitment and selection

Six community-based Child Care Resource and Referral agencies recruited and selected pilot sites locally using standardized recruitment materials available in English and Spanish, including flyers, emails, applications, and a scoring rubric. Scoring was weighted to prioritize centers serving children who were Hmong, Latino, African American, and American Indian and of low socioeconomic status. Other factors included regulatory compliance, program longevity, staff retention, motivation for quality improvement, benefit, program buy-in, and family engagement. The 15 highest-scoring sites were selected for *Active Early* 2.0 intervention evaluation. The *Active Early* 2.0 intervention was reviewed by the University of Wisconsin-Madison's Institutional Review Board and was granted exemption from full review. For providers, all evaluation data were de-identified; if a provider or staff verbally declined to participate, their data were not included. All evaluation data of participating children were de-identified, and parents/caregivers were provided the option to submit an opt-out form for the child.

2.2. Intervention delivery

Active Early 2.0 consisted of provider training, development of quality improvement plans, microgrants, and ongoing technical assistance throughout a 2-year intervention period.

2.2.1. Curriculum and training

Development of the *Active Early* guide has been described previously (LaRowe et al., 2016). In brief, an 80-page guide, *Active Early: A Wisconsin guide for improving childhood physical activity* (Cullen et al., n.d.) was developed by a statewide partnership based on available scientific evidence, public health practices, and national recommendations around 6 key areas related to physical activity: Development, Child Assessment, Routines, Environment, Resources, and Business Practices. Each key area included sample daily routines, activity ideas, suggested equipment and materials, culturally competent approaches, and strategies to engage families and communities around increasing physical activity. After baseline evaluation, pilot sites received a 4-h training on foundational topics relating to physical activity in early care and education, including childhood obesity, definitions of physical activity and age-based recommendations, child development, and development of quality improvement plans. Providers also were trained on daily routines (e.g., schedules, lesson plans, transitions), indoor and outdoor environments, child-provider interactions, policies, provider wellness, and family involvement. *The Guide* and all trainings were available in