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## Short Communication

# The theoretical foundation, fidelity, feasibility, and acceptability of a teacher training to promote physical activity among preschoolers in child care: A pilot study

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## ABSTRACT

This article describes the Wellness Enhancing Physical Activity in Young Children (WE PLAY) teacher training, which was designed to assist early childhood educators to promote physical activity among preschoolers in child care. We describe the WE PLAY intervention and its grounding in constructs from theories of health behavior and an implementation science framework. Fidelity, feasibility, and acceptability data from the WE PLAY pilot study, a cluster randomized controlled trial (RCT) with six Head Start programs in Massachusetts. Data, collected between October 2017–May 2018, are from teachers and supervisors at 3 preschool programs who participated in the WE PLAY (intervention) group. To understand program feasibility and acceptability, we used the Usage Rating Profile-Intervention (URP-I;  $n = 13$ ) and key informant interviews ( $n = 5$ ). The URP-I is a validated teacher survey with 6 subscales (Acceptability, Understanding, Feasibility, Family-School Collaboration, Systems Climate, and Systems Support). It was administered twice; immediately after users completed the first component, an online training (week 2), and after implementation of all program components (week 4). WE PLAY was implemented as it was intended, and it was considered acceptable and feasible to users. There was an increase in users' understanding of how to implement the program between weeks 2 and 4, and a concomitant decrease in the amount of additional systems-level supports users thought they would need to implement WE PLAY between weeks 2 and 4. WE PLAY was easily understandable and feasible to implement in real world settings, it was highly acceptable to users, and it deserves further testing.

## 1. Introduction

Child care is an important venue for physical activity (PA) promotion (Institute of Medicine, 2011). With 61% of preschool-age children spending time in child care settings (Federal Interagency Forum of Child and Family Statistics. America's Children, 2017), accumulation of PA in this setting is imperative. Several researchers have developed and evaluated preschool-based interventions that are designed to promote PA in child care. Multiple literature reviews (Mehtala et al., 2014; Hesketh and Campbell, 2010; Campbell and Hesketh, 2007; Ling et al., 2015; Temple and Robinson, 2014; Ward et al., 2010) and one meta-analysis (Finch et al., 2016) have summarized this body of research. In their meta-analysis, Finch and colleagues (Finch et al., 2016) highlighted the importance of interventions that included structured active play, a theoretical grounding, and delivery by experts rather than

preschool staff to promote children's PA. It is critical to identify strategies that can be implemented by preschool teachers, given that implementation by experts is not feasible or sustainable. This report describes the theoretical underpinnings of the Wellness Enhancing Physical Activity for Young Children (WE PLAY) online teacher training program. Additionally, we present pilot data regarding the implementation fidelity, acceptability, and feasibility of WE PLAY.

## 2. Method

## 2.1. Participants and setting

Data from this study are part of a pilot cluster RCT; they were collected between October 2017 and May 2018. A convenience sample of six Head Start preschools that were located in the same county in

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**Table 1**  
Wellness Enhancing Physical Activity for Young Children (WE PLAY) components, rationale, and theoretical grounding.

Component	Description	Rationale/Connections to theory
Online training	60-min online, interactive training, narrated in English, provides research-based information in practitioner-friendly terms. Users complete four activities. The training provides an overview of subsequent program components.	The online training aims to instill/emphasize knowledge, positive attitudes, and motivation about PA (personal factors from SCT), and to increase perceived behavioral control, and social and moral norms related PA promotion (constructs from TPB).
Video library	16 brief videos (2–3 min) of a preschool teacher leading structured active games indoors with groups of 3- and 4-year-old children. Games require low cost or no equipment. The videos include warm up activities, parachute games, and other large group games.	The preschool teacher serves as a video-based role model for teachers potentially increasing their self-efficacy (SCT) and their perceived behavioral control (TPB) related to leading structured active games. A barrier for preschool teachers is a lack of knowledge of structured active games.
Game sheets	Game sheets accompany each game in the video library. They include instructions, equipment for making the games more and less challenging, and links to school readiness.	Game sheets support teachers' efforts to lead structured active play. They may increase knowledge and self-efficacy (SCT) as well as perceived behavioral control (TPB). Highlighting links to school readiness promotes positive attitudes about PA (TPB).
Teacher self-assessment	Teachers set active play goals for their classroom, try out 3 new games from the video library, practice using skills described in the online training, and reflect on their experience by identifying things that went well and areas for improvement.	By trying out new games and experiencing children's enjoyment, teachers are reinforced to continue new practices, their self-confidence is further strengthened, and they have increased perceived behavioral control over their ability to promote PA (SCT and TPB).
Administrator support	Supervisors conduct observations of teachers during active play and provide performance feedback after the observation. Administrators use a form that is parallel to the teacher self-assessment. They find ways to recognize teacher efforts.	Involving supervisors impacts the social norms in the program regarding the importance of PA promotion (TPB). Social norms, feedback, peers serving as social models are also related to environmental factors in SCT.
Activity pack	Programs received an activity pack, containing equipment needed to implement each of the games in the video library.	A potential structural barrier was that staff would not have the materials needed to play the structured games. Providing the materials changed the environment so that promotion of PA can be accomplished more easily (SCT). Excitement over the materials led to more positive attitudes about promoting PA (TPB).

Notes: TPB = theory of planned behavior; SCT = social cognitive theory.

Massachusetts and were run by one agency were pair-matched on the size of the program, and one program within each pair was randomly assigned to either the WE PLAY (intervention) or a control group. Data in this article are from teachers ( $N = 11$ ) and site supervisors ( $N = 2$ ) in the WE PLAY group.

## 2.2. WE PLAY intervention

WE PLAY is comprised of six free standing components plus a program manual that provides implementation guidance. The components include: (1) an online training; (2) video library of structured active games; (3) game sheets; (4) teacher self-assessment; (5) administrator support; and (6) an activity pack of mobile equipment (Table 1). All materials (except the activity pack) were available on the WE PLAY website. The components were designed to be synergistic, and were meant to be completed over 4–6 weeks. WE PLAY was designed to be completed with minimal, if any technical assistance from external staff. One supervisor at each site completed the online training to facilitate the administrator support component.

Theoretical constructs from social cognitive theory (SCT) (Bandura, 1986) and the theory of planned behavior (TPB) (Ajzen, 1991), and the quality implementation framework (QIF) (Meyers et al., 2012) from implementation science were used to guide development, implementation, and evaluation of WE PLAY. Tenets of SCT included bidirectional interactions between personal, environmental and behavioral factors, the importance of observational learning with a relatable video model, goal setting, and self-efficacy were applied because there is evidence that SCT is a useful framework to understand PA behavior (Young et al., 2014). Constructs from TPB (Ajzen, 1991), including subjective and moral norms and perceived behavioral control, were drawn upon because these constructs were shown to account for 85% of the variance related to teachers' intentions to promote PA in prior research (Gagne and Harnois, 2014). Strategies to promote implementation were also considered. Specifically, the QIF was selected because it serves as an overarching framework that encompasses principles from 25 implementation frameworks. The QIF is comprised of four phases (Initial Considerations Regarding the Host Setting, Creating a Structure

for Implementation, Ongoing Structure Once Implementation Begins, and Improving Future Applications) and 14 steps (Meyers et al., 2012). A detailed description of the WE PLAY components and how they are linked to SCT and TPB is provided in Table 1. A description of how we applied the QIF in the development and implementation of WE PLAY is provided in the Supplementary materials.

## 2.3. Measures

### 2.3.1. Implementation fidelity

To measure program implementation, data were aggregated from several sources including CourseSites and Vimeo, which hosted the online training and video library, respectively. Teacher self-assessment forms and supervisor observation forms were used to assess completion of the self-assessment and supervisor support components.

### 2.3.2. Usage Rating Profile-Intervention

Teachers completed an adapted version of the Usage Rating Profile-Intervention (URP-I) a 29-item, self-report measure that assesses six factors that explain whether an individual will adopt and utilize an intervention over time: Acceptability; Understanding; Family School Collaboration; Feasibility; System Climate; and System Support ( $\alpha = 0.72$ – $0.95$ ) (Briesch et al., 2013). Teachers rated each item using a 6-point scale (1 = Strongly Disagree to 6 = Strongly Agree). We adapted the measure to be specific to PA and WE PLAY. Average ratings for each subscale were computed.

### 2.3.3. Key informant interviews

A script was used to guide key informant interviews with teachers and supervisors. Open-ended questions asked users to provide feedback on each WE PLAY component, including suggestions for improvement, points of confusion, and implementation challenges.

## 2.4. Procedures

Study procedures were approved by the IRB at Northeastern University. Participants provided written consent. They completed

electronic surveys on three occasions: pre-intervention (week 1), after the online training (week 2), and after completing all training components (week 4). Demographic data were collected at week 1, the URP-I was administered at weeks 2 and 4. Key informant interviews were conducted by the first and second authors by phone, they were audio-recorded and transcribed. Interviews with all teachers were not possible because scheduling requests were made after teachers had left for the summer. Teachers and supervisors received \$50 in gift cards for completing study questionnaires and a \$10 gift card for completing an interview. Programs received activity packs, valued at \$280 each, which included all of the PA equipment needed to play the PA games in the video library. The agency received a \$1500 stipend.

Quantitative data were analyzed in SPSS (version 25). Paired *t*-tests were used to examine differences in URP-I scores between Times 1 and 2. The first two authors analyzed participants' interview transcripts to derive themes separately and then together.

### 3. Results

Teachers had a mean of 13.36 years (*SD* = 5.92) of teaching experience. Approximately half (46%) of teachers held an associate's degree, 27% held a bachelor's degree, 9% completed some college, and 18% completed some post-graduate training. Supervisors had an average of 30.5 years (*SD* = 7.78) of teaching experience.

#### 3.1. Implementation fidelity

On average, teachers spent 98 min (*SD* = 27) completing the online training. Each teacher completed all four of the online activities embedded in the training. Teachers viewed an average of 14 of the 16 videos. On average 93% of each video was viewed (*SD* = 6.84). Self-assessment and administrator observation forms that were able to be collected provided evidence that observations were conducted and self-assessments were completed. Unfortunately, forms were not able to be collected from all teachers before they left for summer vacation.

#### 3.2. Implementation acceptability, feasibility, understanding and other user perceptions

Mean URP-I subscale scores at the two assessment periods are shown in Table 2. Participants reported high levels of intervention acceptability and feasibility. They reported an increased understanding of how to implement WE PLAY at week 4 (*M* = 5.54; *SD* = 0.56) relative to week 2 (*M* = 3.69; *SD* = 0.25), *t*(12) = -15.57, *p* < .001. Additionally, teachers reported a decrease in their need for systems-level support to implement WE PLAY at week 4 (*M* = 2.67; *SD* = 1.36) relative to week 2 (*M* = 3.59; *SD* = 1.40), *t*(12) = 3.10, *p* < .01.

Interview data revealed a theme of positive regard for WE PLAY

among teachers (*n* = 3) and supervisors (*n* = 2). Comments indicated high acceptability and feasibility of each program component, and interviewees provided suggestions for improving the program in the future. Interviewees believed all program components were important, particularly the video models and the activity packs. They also believed the self-assessment and supervisor observations stimulated new ideas, critical thinking, and creativity about how they lead and facilitate active play. Teachers and supervisors liked that there was sufficient flexibility for teachers to take the ideas presented in the training and to make them their own, and viewed the particular games in WE PLAY as easily adaptable to groups of different sizes, different ages of children, and in different play spaces. Sample quotes that illustrate each theme are provided in the Supplementary materials.

### 4. Discussion

This article described the theoretical foundations of WE PLAY, which was designed to expand the capacity of early childhood educators to promote daily PA with preschoolers in child care. WE PLAY's strong theoretical foundation is an important contribution to the literature because most PA promotion interventions for young children lack a theoretical grounding and interventions with a theoretical basis have been shown to be more effective in promoting PA (Finch et al., 2016). The fact that WE PLAY can be accessed online, anywhere, at any time, and is low cost means that child care programs can adopt WE PLAY readily. An added benefit to online training is that it can address problems associated with teacher turnover; teachers can be trained as they are hired.

Our pilot data demonstrated that the WE PLAY teacher training was implemented as intended, with the exception that not all teachers received supervisor feedback meetings. Staff may have been motivated to complete WE PLAY as intended because they were eligible to receive continuing education credit and could use work hours to complete the training. It is unlikely that the same level of implementation fidelity would have been achieved had teachers been unable to use work hours to complete the training. Strong implementation fidelity may have also been due to the fact that we designed WE PLAY to address potential implementation barriers at the systems and personal levels, including small play spaces, the weather, the cost and availability of equipment, teachers' knowledge of active play games, and their confidence leading active play. Finally, process data indicated that teachers completed all WE PLAY training components.

Teachers reported high levels of acceptability and feasibility and that WE PLAY fit well within their school climate at both URP-I administrations. This may be attributed to the participatory approach we followed throughout the design phase of WE PLAY, co-developing intervention components with end-users, preschool teachers and administrators. There was an increase in teachers' understanding of how to

**Table 2**  
WE PLAY users' (*N* = 13) Usage Rating Profile-Intervention (URP-I) subscale scores.

Subscale ( <i>n</i> items)	Week 2 <i>M</i> ( <i>SD</i> )	Week 4 <i>M</i> ( <i>SD</i> )	Sample item
Acceptability (9)	5.38 (0.50)	5.49 (0.42)	The examples of physically active games in the WE PLAY video library, such as the Tree Planters and Tree Cutters game, easily fit in with my current practices.
Understanding (2)	3.69 (0.25)	5.54 (0.56)**	I understand how to lead physically active games with young children.
Family-School Collaboration (3)	5.23 (0.37)	5.21 (0.69)	Regular home-school communication is needed to help students be active at least 2 h a day.
Feasibility (6)	5.02 (0.56)	5.15 (0.49)	The equipment needed to lead physically active games like those in WE PLAY is reasonable.
System Climate (8)	5.10 (0.49)	5.11 (0.43)	My supervisor(s) would be supportive of me leading physically active games with my students.
System Support (3)	3.59 (1.40)	2.67 (1.36)*	I would require additional professional development beyond what is provided in WE PLAY to lead physically active games with students.

Notes: The WE PLAY pilot study was conducted in Head Start preschool programs in Massachusetts between October 2017 and May 2018. Item scores ranged from 1 = *strongly disagree* to 6 = *strongly agree*. Week 2 refers to URP-I administration immediately following completion of the WE PLAY online training; Week 4 refers to administration after WE PLAY users had implemented all WE PLAY components.

\* *p* < .01.

\*\* *p* < .001.

use WE PLAY between the first and second URP-I administrations, indicating the online training approach was understandable to users. There was a concomitant decrease in teachers' beliefs that they needed additional systems-level supports to lead active play, indicating that teachers felt more capable about their abilities to lead active play without additional supports. The university-based team intentionally provided minimal support (e.g., email prompts) to staff related to program implementation given the value of a training model that does not require significant attention from consultants. We attribute the high levels of program acceptability and feasibility to our attention to structural and personal implementation barriers. Jones and colleagues (Jones et al., 2017) recently called for researchers to draw on implementation science when designing and testing obesity prevention interventions in child care. To our knowledge, this study represents the first time a framework from implementation science has been applied to the design of a PA promotion intervention for child care.

This process evaluation was limited by the small number of teachers who participated, that all participants came from one agency, and that teachers opted to participate in the study, thereby limiting our ability to generalize our findings beyond our small sample. An additional limitation is the absence of objective measures of teacher behaviors during active play time before and after the WE PLAY training. During key informant interviews, multiple teachers elaborated on various adaptations they made to the game examples shown in the WE PLAY library in promoting structured active play with their students based on their class size and available space, providing evidence that the WE PLAY training provided clarity regarding how teachers could implement activities despite constraints they face. However, conclusions regarding if and how teachers actually made adaptations to their practices following the training are limited.

Web-based training to support teacher PA promotion in child care is a promising, new approach that could result in a large reach and has the potential for a public health impact. Indeed, we are aware of only one other study that has examined online training in this area, and that study also reported high levels of implementation fidelity (Kennedy et al., 2017). Due to the small sample size of the current study, a larger study of WE PLAY with more teachers in Head Start and non-Head Start programs and direct measurement of teachers' behaviors is warranted. Data examining the impact of WE PLAY on children's PA is also critical to establish an evidence base for this acceptable and usable program. Future research with the WE PLAY training program is important given the paucity of teacher-led interventions in child care that effectively increase children's engagement in PA.

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## Conflicts of interest

The authors have no conflicts of interest to report.

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## Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.pmedr.2019.01.003>.

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