



## Process evaluation of a culturally-tailored physical activity intervention in African-American mother-daughter dyads

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### ABSTRACT

The purpose of this study was to describe process evaluation data including intervention fidelity, dosage, quality, participant responsiveness, and program reach for the Mothers And daughters dancing together Trial (MAGNET) in Springfield, MA, in Spring 2013 and 2014. Seventy-six mother-daughter dyads were randomized to the mother-daughter group (CH-M,  $n = 28$ ), the child-only group (CH,  $n = 25$ ), or the health education group (CON,  $n = 23$ ). CH-M consisted of 60 min of moderate-to-vigorous culturally-tailored dance classes for dyads. CH consisted of dance classes for the child. All groups received homework tutoring and weekly health newsletters. Process evaluation data were assessed at each intervention session (three days/week, 6-months) with semi-structured questionnaires by researchers. CH dance classes were slightly longer ( $58.2 \pm 3.5$  min) than CH-M ( $54.4 \pm 5.5$  min). In both groups, participants spent the majority of the dance intervention in light intensity physical activity (PA). Participants in the CH-M group enjoyed participating in MAGNET > 90% of the time. Mothers (92%) indicated that they wanted to continue dance as a form of PA. Mothers expressed that transportation, time commitment, and assessments were barriers to participation. Participants suggested future interventions should include longer intervention length and more communications between research staff and mothers. The MAGNET intervention matched the originally intended program in most aspects. A lower intervention dose was delivered to the CH-M group potentially due to barriers described by mothers. Because mother-daughter interventions have shown minimal effects on increasing PA, it is imperative that researchers utilize process evaluation data to shape future studies.

### 1. Introduction

Current recommendations suggest that children (ages 6–17 years) engage in at least 60 min of daily moderate to vigorous physical activity (MVPA) (US Department of Health and Human Services, 2008). However, these guidelines are not being met by most children as only 35% of 6–11 year-old children are attaining the recommended daily amount of physical activity (PA) (Troiano et al., 2008). Additionally, African-American girls are more likely to report not meeting PA guidelines during the week compared to their Caucasian and Hispanic counterparts (Eaton et al., 2012). Because African-American girls are not meeting PA guidelines (Eaton et al., 2012), effective interventions are needed to increase time spent in MVPA in this population. Several PA interventions have been conducted in a variety of settings (e.g., in-school, after-school, home-based) in an attempt to increase PA in minority children, but have reported minimal changes (Brown and Summerbell, 2009; Trost et al., 2011).

In pre-adolescent minority children, research has suggested that for

a PA intervention to be effective, it must include enjoyable activities and incorporate the family, specifically the mother (Kumanyika and Grier, 2006). Currently, very few studies have examined the impact of parent-child PA interventions on the PA levels of children and have reported mixed results (Brown et al., 2016; van Sluijs et al., 2011). Additionally, family-based interventions specifically in African-American girls have shown equivocal results, with no clear strategies for parent involvement to aid in intervention success (Barr-Anderson et al., 2013). Although there is low quantity of culturally-tailored mother-daughter PA interventions, the reported mixed results could be due to the implementation of these interventions or other process evaluation issues (i.e., study fidelity). Intervention success or failure can be attributed to the degree of which the intervention was delivered as originally planned and the effectiveness of the intervention implementation procedure (Durlak and DuPre, 2008). Typically, studies will report one or two components of process evaluation data (e.g., participant attendance), but few have comprehensively reported all process evaluation measures. Without an understanding of intervention

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implementation, it is difficult to understand exactly what program was delivered and properly interpret study outcomes (Durlak and DuPre, 2008). Therefore, it is important to assess and understand how these factors (i.e., intervention implementation) contribute to study outcomes. Unfortunately, there is limited data describing the process evaluation of African-American parent-child interventions. Therefore, the purpose of this paper is to describe the study process evaluation data (intervention fidelity, dosage, quality, participant responsiveness, and program reach) of the Mothers And daughters daNcing togEther Trial (MAGNET). MAGNET was designed to examine the effects of a 12-week mother-daughter afterschool culturally-tailored dance intervention on the PA levels of African-American pre-adolescent girls.

## 2. Methods

Participants were recruited via flyers, radio announcements, and face-to-face recruitment in the Springfield, MA, area. In Springfield, 59.5% of individuals completed high school or less, 70.8% have a household income less than \$50,000, and 18.3% of children live in single-parent families (US Census Bureau, 2013). Daughters were eligible to participate if they were between 7 and 10 years old, identified as African-American or Black, and had a maternal figure willing to participate. Participants were excluded if they had any condition limiting their ability to participate in PA or assessment measures, or could not complete the informed consent in English. Additionally, daughters were excluded if they had any medical condition affecting growth or took medications affecting growth. Mother-daughter dyads ( $n = 76$ ) were randomized to one of three intervention groups: mother-daughter dance (CH-M,  $n = 28$ ), daughter only dance (CH,  $n = 25$ ), or a health education group (CON,  $n = 23$ ). The total sample was divided among two cohorts (cohort 1 = Spring 2013; cohort 2 = Spring 2014). Each cohort consisted of all three groups. Dyads in the CH-M group attended dance classes designed to elicit MVPA for 60 min, three days/week. Daughters in the CH group attended dance classes alone, while their mother participated in the health education program. MAGNET was culturally-tailored with both the surface (dance styles and music, African American instructor) and deep structure (historical influences, importance of maternal figure, collectivism) influences (Resnicow et al., 1999). CH-M and CH daughters received cultural lessons once per week for 15 min (e.g. African-American women in history spotlight, cultural ties to dance). Dyads in the CON group participated in the health education program consisting of weekly lessons and newsletters sent home. All interventions were implemented three days/week for 12 weeks. Participants also received a healthy snack and homework tutoring (60 min) as part of the program. All procedures were in accordance with the ethical standards of the responsible committee on human experimentation (institutional and national) and with the Helsinki Declaration of 1975, as revised in 2000. All study protocols were approved by the University of Massachusetts Amherst Institutional Review Board. To participate in this study, mothers provided written informed consent for both themselves and their daughter, and daughters provided written assent.

The intervention design was based on the social cognitive theory (SCT), which suggests that behavior is learned, in part, through modeling and observation of peers and role models (i.e., mother) (Bandura, 1998; Bandura, 1986). These learned behaviors are altered and maintained through the interplay of personal factors (i.e., self-efficacy, outcome expectation), behavioral factors (i.e., skills needed, competence), and environmental factors (i.e., inclusion of mother, cues). Intervention components were determined from formative research focus groups (Alhassan et al., 2014). Results from these focus groups indicated that African, Hip-Hop, and Jazz were the preferred dance styles and that they valued a dance instructor with whom they could identify with. Therefore, an experienced African-American dance instructor was hired to lead the dance classes.

Participants' height and weight were measured using standard

procedures at baseline, midpoint (6-weeks), and post-intervention (12-weeks). From these data, mothers' BMI and daughters' BMI percentile were calculated. Physical activity was assessed using an Actigraph accelerometer (GT1M/GT3X, Actigraph LLC, Pensacola, FL) for seven consecutive days at baseline, midpoint, and post-intervention. The accelerometer was worn during all waking hours on an elastic belt around the waist and placed on the right hip of both mothers and daughters. Data collectors were trained prior to the beginning of intervention implementation to observe intervention sessions and accurately record fidelity and process evaluation information. Data was collected via a semi-structured questionnaire that was developed specifically for this study. During each intervention session, a trained data collector sat in the back of the room, observed the session, and recorded data without interacting with participants. Overall, study process evaluation was assessed every day of the 12-week intervention. However, intervention (culturally-tailored dance session) intensity was assessed one randomly selected day per week using Actigraph accelerometers. Process evaluation measures were guided by Durlak and Dupre's manuscript and included intervention fidelity (i.e. adherence, compliance, integrity), dosage (i.e. quantity), quality (i.e. correct delivery), participant responsiveness (i.e. interest, attentiveness), program reach (i.e. participation rates), and adaptation (i.e. program modification) (Durlak and DuPre, 2008). Additionally, mothers' perception (i.e., barriers to intervention participation, favorite and least favorite intervention components) and satisfaction (i.e., with research staff and dance instructor) of the program were assessed at the completion of the program using an open-ended survey. Means and standard deviations were calculated for continuous variables and frequency distributions and exemplary quotes were utilized for categorical (i.e., qualitative) variables.

## 3. Results

Participants in the MAGNET intervention included 76 mother-daughter dyads. A large percentage of study participants came from single-parent households (61.6%) with an annual income < \$39,000 (62.8%) (Table 1). Intervention dance classes lasted  $58.2 \pm 3.5$  min and  $54.4 \pm 5.5$  min for the CH and CH-M groups, respectively. To assess fidelity, adherence to the intervention dance classes was measured using Actigraph GT3X accelerometers. Participants spent the majority of the time in dance class in light intensity activity. During the CH dance classes, daughters spent an average of  $6.4 \pm 8.7$  min in sedentary behavior,  $41.1 \pm 9.3$  min in light intensity activity, and  $11.1 \pm 8.5$  min in MVPA. During the CH-M dance classes, daughters spent an average of  $9.1 \pm 12.9$  min in sedentary behavior,  $34.1 \pm 12.0$  min in light intensity activity, and  $10.8 \pm 8.8$  min in MVPA. These data indicate that daughters in the CH dance class spent less time being sedentary and more time in light intensity and MVPA compared to the daughters in the CH-M group.

Across both study cohorts, 64 of 72 (88.9%) possible intervention days were implemented. Eight total intervention sessions were cancelled (cohort 1,  $n = 5$ ; cohort 2,  $n = 3$ ) due to inclement weather. Each session was designed to incorporate African-American cultural

**Table 1**  
Baseline characteristics of MAGNET participants.

	Mothers	Daughters
Age (years)	37.4 $\pm$ 7.7	8.3 $\pm$ 1.3
BMI (kg/m <sup>2</sup> )	31.9 $\pm$ 7.2	–
BMI percentile	–	68.2 $\pm$ 29.1
TD sedentary time (%)	71.2 $\pm$ 7.0	60.2 $\pm$ 10.0
TD light PA (%)	27.2 $\pm$ 6.3	36.8 $\pm$ 8.9
TD MVPA (%)	1.6 $\pm$ 1.1	2.9 $\pm$ 2.0

All values are presented as mean  $\pm$  sd. BMI = body mass index; TD = total day; PA = physical activity; MVPA = moderate-to-vigorous physical activity. Wear time for mothers and daughters were 5.1 days and 5.4 days, respectively.

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