



Review Article

The forgotten parent: Fathers' representation in family interventions to prevent childhood obesity

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ABSTRACT

Despite recognition that parents are critical stakeholders in childhood obesity prevention, obesity research has overwhelmingly focused on mothers. In a recent review, fathers represented only 17% of parent participants in > 600 observational studies on parenting and childhood obesity. The current study examined the representation of fathers in family interventions to prevent childhood obesity and characteristics of interventions that include fathers compared with those that only include mothers. Eligible studies included family-based interventions for childhood obesity prevention published between 2008 and 2015 identified in a recent systematic review. Data on intervention characteristics were extracted from the original review. Using a standardized coding scheme, these data were augmented with new data on the number of participating fathers/male caregivers and mothers/female caregivers. Out of 85 eligible interventions, 31 (37%) included mothers and fathers, 29 (34%) included only mothers, 1 (1%) included only fathers, and 24 (28%) did not provide information on parent gender. Of the interventions that included fathers, half included 10 or fewer fathers. Across all interventions, fathers represented a mere 6% of parent participants. Father inclusion was more common in interventions targeting families with elementary school-aged children (6–10 years) and those grounded in Ecological Systems Theory, and was less common in interventions focused on very young children (0–1 years) or the prenatal period and those targeting the sleep environment. This study emphasizes the lack of fathers in childhood obesity interventions and highlights a particular need to recruit and engage fathers of young children in prevention efforts.

1. Introduction

Childhood obesity is a pressing public health problem with short and long term health consequences (Reilly et al., 2003; Daniels, 2006). Given that children's diet and physical activity behaviors are established in the context of the family (Birch and Davison, 2001; Davison and Birch, 2001; Ventura and Birch, 2008; Trost and Loprinzi, 2011), engaging parents and families in the prevention of obesity is critical (Monasta et al., 2011; Waters et al., 2011). Despite widespread recognition of the pressing need to engage parents in childhood obesity interventions, research has overwhelmingly focused on mothers. In a 2016 systematic review and content analysis (Davison et al., 2016), our research team documented the inclusion of fathers in more than 600 observational studies on parenting and childhood obesity published since 2009. Results showed that fathers represented only 17% of all

parent participants, with an average of 139 fathers per study compared with 672 mothers per study.

Father inclusion in parenting interventions is similarly low (Panter-Brick et al., 2014). This pattern is problematic given research illustrating improved child outcomes when parenting interventions include mothers and fathers compared with those that only include mothers (Lundahl et al., 2008). Research increasingly supports the need to include fathers in childhood obesity interventions. In a nationally representative US sample, over 70% of fathers with co-residential children aged 5 years or younger reported that they fed or ate a meal with their child every day over the previous 4 weeks (Jones, 2013). Similarly, fathers consider themselves responsible for feeding their children and helping with meal preparation including grocery shopping (Khandpur et al., 2014). Fathers' parenting approaches have in turn been linked with children's weight-related behaviors and outcomes. For

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example, research shows that higher paternal restriction of child access to food (Loth et al., 2013; Musher-Eizenman et al., 2009; Musher-Eizenman et al., 2007) and lower paternal pressure to eat (Loth et al., 2013; Tschann et al., 2013) are linked with higher body mass index (BMI) in children, a pattern that is consistent with what has been observed for mothers (Ventura and Birch, 2008).

Despite a documented need to include fathers in childhood obesity interventions, rates of father participation appear to be low. In a recent systematic review, Morgan and colleagues examined the inclusion of fathers in family interventions to treat and prevent childhood obesity. The authors found that in cases where one parent per family was recruited, only 6% were fathers (Morgan et al., 2017). The authors also reported that only 2 studies, from more than 200, explicitly reported using recruitment strategies targeted to fathers and only 4 studies reported low father involvement as a study limitation.

The current study examines the inclusion of fathers in family interventions to prevent childhood obesity and assesses differences in intervention content, child age, theories utilized, and the inclusion of underserved groups (low income, racial/ethnic minority) for interventions with and without fathers. This information will help identify characteristics of interventions that do not include fathers and particular subgroups of fathers who are excluded or missing from existing interventions. To guide future funding efforts, funding sources for interventions that include fathers are also characterized. While replicating elements of Morgan et al. (Morgan et al., 2017) this study is unique in its assessment of the theories utilized, sample size distributions, inclusion of underserved populations and funding sources.

2. Methods

This study utilized data from a recent systematic review and content analysis of family interventions for childhood obesity prevention (Ash et al., 2017) and was registered in PROSPERO (CRD42016041873) prior to its implementation and independent from the original review (CRD42016042009). Existing data for eligible interventions were augmented with new data on the inclusion of fathers/male caregivers and mothers/female caregivers. Methods from the original review are briefly summarized below followed by a description of the methods used to compile new data for this study. A detailed description of the original review methods, including the PRISMA reporting protocol, is provided in Ash et al. (Ash et al., 2017).

2.1. The original review

With the assistance of a research librarian, two researchers searched three research databases (PubMed, PsycINFO and CINAHL) using search terms that combined the concepts of family (e.g., family, father, mother), intervention (e.g., intervention, prevention, trial), children (e.g., child, infant, preschool), and obesity (obesity, body mass, overweight). The search was limited to articles published between January 1st 2008 and December 31st 2015. After removing duplicates, 8525 unique studies were identified and screened against eligibility criteria.

Eligible studies for the original review included family-based interventions for childhood obesity prevention published in English. The following studies were not eligible for inclusion: Studies that exclusively recruited children with overweight or obesity (i.e., treatment studies), studies that focused on specific clinical populations, dissertations and conference abstracts. In instances where multiple studies were published on the same intervention, the data extracted from each study were synthesized into a single entry resulting in a final sample of 119 unique eligible interventions. Two trained coders used conventional content analysis methodology (Berelson, 1952; Manganello and Blake, 2010) to code up to 90 intervention and participant characteristics for each study. Variables utilized in the current study from the original review include publication year, geographic region, age of the target child (prenatal, 0–1 year, 2–5 years, 6–10 years, 11–13 years,

14–17 years), intervention setting (home, community, clinic, school, childcare), theory utilized (none, Social Cognitive Theory, Ecological Systems Theory, Baumrind's parenting styles, Transtheoretical Model, other), racial/ethnic (White, Black/African American, Hispanic/Latino, other) and underserved (single parents, immigrant families, families with low socioeconomic status, SES) groups included, intervention delivery mode (in-person, technology based), factors targeted within the home environment (food parenting/environment, physical activity parenting/environment, media parenting/environment, sleep parenting/environment), and funding source.

2.2. New data coded for this study

Although the original review included intervention protocols, they were excluded from this study because they do not consistently report participant characteristics leaving 85 unique eligible interventions. To augment the data from the original review, two trained researchers coded new data on parent gender and sample size with a mean inter-coder reliability (kappa) of 0.88. The coders recorded (a) whether the intervention included mothers/female caregivers, fathers/male caregivers, both, or if parent gender was unclear or not specified, and (b) the number of male and female parent participants at baseline using the following sample size categories (0, 1–10, 11–50, 51–100, 101–150, 151–200...401–450, 451–500, 501–1000, 1001–1500, 1501–2000). Sample size ranges were coded to facilitate consistent coding across coders (given variations in sample size numbers reported in a given paper) and to reduce coding burden.

2.3. Data synthesis and analysis

All missing data were reviewed. In most instances, missing data were the result of planned skip patterns. For example, when mothers or fathers were not included in a study, the coders were not prompted through the electronic coding form, to code the sample size for that group. In such cases, the number of participant mothers/fathers was coded as “0”. For missing data that were not the result of skip patterns, one of the authors returned to the original article and retrieved the missing information.

To address the first research question, the sum of participating fathers and mothers across all interventions and the average number of fathers and mothers per intervention were calculated. Prior to these calculations, each sample size category was converted to a continuous score using the mid-point of that range (e.g., the category 0–10 participants was coded as 5). Using data from a previous content analysis of father participation in observational studies (Davison et al., 2016; Gicevic et al., 2016) we verified that the mean score did not appreciably differ when calculated based on raw sample size scores (i.e., the actual number of individuals who participated) compared with midpoints of sample size ranges as utilized in this study. Thus, we do not anticipate that this approach interjected appreciable (and systematic) error into the data. Studies that did not include any fathers (or mothers) received a score of 0 for sample size. In cases where parents were included as participants but no information on parent gender was provided, the number of mothers and fathers was coded as missing. The midpoint scores were summed separately for mothers and fathers across all interventions. To calculate the average number of fathers and mothers per intervention, the total number of participants was divided by the number of interventions that contributed to the total score. For fathers, the denominator was 54 interventions. For mothers, the denominator was 55.

An independent *t*-test was used to test the difference in average sample size of fathers versus mothers. Cohen's *d* was calculated based on the results of the *t*-test (i.e., mean difference/pooled standard deviation) to provide a measure of effect size with 0.2, 0.5, and 0.8 interpreted as small, medium and large effect sizes respectively. To address the second research question, eligible interventions in which

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