Preventive Medicine 61 (2014) 90–99

Contents lists available at ScienceDirect

Preventive Medicine

journal homepage: www.elsevier.com/locate/ypmed

The 'Healthy Dads, Healthy Kids' community randomized controlled trial: A community-based healthy lifestyle program for fathers and their children ☆

Philip J. Morgan [a,b,*], Clare E. Collins [a,c], Ronald C. Plotnikoff [a,b], Robin Callister [a,d], Tracy Burrows [a,c], Richard Fletcher [e], Anthony D. Okely [f], Myles D. Young [a,b], Andrew Miller [a,b], Adam B. Lloyd [a,b], Alyce T. Cook [a,b], Joel Cruickshank [a,b], Kristen L. Saunders [a,b], David R. Lubans [a,b]

[a] Priority Research Centre in Physical Activity and Nutrition, University of Newcastle, Callaghan, NSW, Australia
[b] School of Education, Faculty of Education & Arts, University of Newcastle, Callaghan, NSW, Australia
[c] School of Health Sciences, Faculty of Health and Medicine, University of Newcastle, Callaghan, NSW, Australia
[d] School of Biomedical Sciences and Pharmacy, Faculty of Health and Medicine, University of Newcastle, Callaghan, NSW, Australia
[e] School of Medicine and Public Health, University of Newcastle, Callaghan, NSW, Australia
[f] Interdisciplinary Educational Research Institute and Faculty of Education, University of Wollongong, NSW, Australia

ARTICLE INFO

Available online 29 December 2013

Keywords:
Weight loss
Men
Obesity
Children
Fathers
Intervention
Translational research

ABSTRACT

Objective: To evaluate the effectiveness of the 'Healthy Dads, Healthy Kids (HDHK)' program when delivered by trained facilitators in community settings.

Method: A two-arm randomized controlled trial of 93 overweight/obese fathers (mean [SD] age = 40.3 [5.3] years; BMI = 32.5 [3.8] kg/m^2) and their primary school-aged children (n = 132) from the Hunter Region, Australia. In 2010–2011, families were randomized to either: (i) HDHK intervention (n = 48 fathers, n = 72 children) or (ii) wait-list control group. The 7-week intervention included seven sessions and resources (booklets, pedometers). Assessments were held at baseline and 14-weeks with fathers' weight (kg) as the primary outcome. Secondary outcomes for fathers and children included waist, BMI, blood pressure, resting heart rate, physical activity (pedometry), and self-reported dietary intake and sedentary behaviors.

Results: Linear mixed models (intention-to-treat) revealed significant between-group differences for fathers' weight ($P < .001$, $d = 0.24$), with HDHK fathers losing more weight (−3.3 kg; 95%CI, −4.3, −2.4) than control fathers (0.1 kg; 95%CI, −0.9,1.0). Significant treatment effects ($P < .05$) were also found for fathers' waist ($d = 0.41$), BMI ($d = 0.26$), resting heart rate ($d = 0.59$), energy intake ($d = 0.49$) and physical activity ($d = 0.46$) and for children's physical activity ($d = 0.50$) and adiposity ($d = 0.07$).

Discussion: HDHK significantly improved health outcomes and behaviors in fathers and children, providing evidence for program effectiveness when delivered in a community setting.

Introduction

Obesity is a serious public health concern and is associated with numerous adverse health consequences (Barr et al., 2006). Internationally, its prevalence is high and increasing (Finucane et al., 2011), especially among men (Australian Bureau of Statistics, 2011). This is concerning given that, compared to women, men are less likely to perceive themselves as overweight (Lemon et al., 2009), attempt weight loss, or enroll in weight loss programs (French and Jeffery, 1994; Morgan et al., 2011e; Pagoto et al., 2012).

An additional consequence of male obesity is the potential impact overweight and obese fathers may have on their children. Emerging evidence suggests that fathers have a unique and key role in shaping their children's dietary and physical activity behaviors (Freeman et al., 2012; Hall et al., 2011; Wake et al., 2007). For example, a recent longitudinal study of more than 3200 families identified that children with a healthy weight mother were substantially more at risk of becoming obese if their father was overweight (odds ratio 4.18; 95%CI, 1.01–12.33) or obese (odds ratio 14.88; 95%CI, 2.61–84.77) (Freeman et al., 2012). However, the reverse scenario (having an overweight or obese mother with a healthy weight father) was not a significant predictor of childhood obesity. Given that a large proportion of children are not

Abbreviations: HDHK, Healthy Dads, Healthy Kids; BMI, body mass index; LGAs, local government areas; SCT, Social Cognitive Theory; AES, Australian Eating Survey; FFQ, food frequency questionnaire; ACAES, Australian Children and Adolescent Eating Survey; SES, socio-economic status; SEIFA, Socio-Economic Indexes for Areas; LMMs, linear mixed models.

☆ Trial Registration: Australian New Zealand Clinical Trials Registry (ACTRN12610000608066).

* Corresponding author at: Priority Research Centre in Physical Activity and Nutrition, Faculty of Education and Arts, University of Newcastle, Callaghan, NSW 2308, Australia.
E-mail address: Philip.Morgan@newcastle.edu.au (P.J. Morgan).

0091-7435/$ – see front matter © 2013 Published by Elsevier Inc.
http://dx.doi.org/10.1016/j.ypmed.2013.12.019

meeting current diet and physical activity recommendations (Australian Bureau of Statistics, 2013a, 2013b), this provides a clear rationale to explore the efficacy of behavioral interventions that target fathers to improve the health and healthy lifestyle behaviors of both fathers and their children.

Despite this, little is known about how best to engage fathers in lifestyle interventions. Recent systematic reviews have not explored the representation of fathers in parenting interventions for physical activity and nutrition (e.g. Hingle et al., 2010; Marsh et al., in press; O'Connor et al., 2009). As such, researchers have called for greater numbers of fathers in future research (e.g. Patrick et al., 2013; Rodenburg et al., 2013; Sleddens et al., 2011). To the authors' knowledge, we conducted the only published experimental study focusing on physical activity and nutrition that specifically targeted fathers and their children (Morgan et al., 2011b). The *Healthy Dads, Healthy Kids* (HDHK) efficacy trial examined the impact of a lifestyle program targeting overweight or obese fathers to role model and influence their children's physical activity and dietary habits. Children of any weight status were eligible for participation in the study, provided they were in primary school (i.e. typically aged 5–12 years). Relative to the control group, fathers achieved clinically important weight loss and children significantly improved their physical activity levels and dietary intake. Feasibility was established with high levels of recruitment, retention, attendance and satisfaction of participants (Morgan et al., 2011b).

However, these promising efficacy results were obtained from a university-based research study delivered by highly qualified staff in a closely monitored trial. While efficacy is an essential first step to evaluate outcomes under ideal conditions, effectiveness measures the impact of an intervention when implemented in a real-world setting. This represents a more realistic evaluation of the likely intervention effect (Stevens et al., 2007). There is an urgent need to translate obesity prevention and treatment programs with demonstrated efficacy into real-world settings (Green and Glasgow, 2006). Therefore, the aim of the current study was to implement and evaluate the HDHK intervention, when delivered by trained local facilitators in a community setting. This effectiveness study addresses the recent call for more high quality RCTs conducted for child obesity prevention (Waters et al., 2011) and male only weight loss studies (Young et al., 2012).

Methods

Study design

The study was a two-armed randomized controlled trial (RCT). Family units (fathers and their child[ren]) were randomly allocated to one of two groups: the HDHK intervention (treatment) or a wait-list control group. Outcome measures were obtained from all participants at baseline and 14-weeks (post-test). Measurements were taken at an after school setting by trained staff, using the same instruments at each time point. Participants and assessors were blind to group allocation at baseline assessment. The wait-list control group received no information or intervention before attending the follow-up assessments. The following methods for the HDHK community trial have been published in greater detail elsewhere (Morgan et al., 2011d).

Participants

Overweight or obese (BMI between 25 and 40 kg/m^2) fathers (aged 18–65 years) with a child attending primary school (i.e., typically aged between 5 and 12 years) were recruited and assessed between 2010 and 2011 in two cohorts from two local government areas (LGAs) (Singleton and Maitland) in the Hunter Region of NSW, Australia with treatment and control groups at each LGA. Of note, these rural LGAs include high rates of mining and shift work-based employment (Australian Bureau of Statistics, 2009), which are linked to increased risks of obesity and associated health complications (Atkinson et al., 2008). Recruitment strategies included school newsletters, school presentations, interactions with parents waiting to pick their children up from school, local media, and fliers distributed through local communities. Fathers were screened for eligibility via telephone. As in the HDHK efficacy trial, children of any weight status were able to participate in the trial and fathers were required to live with their children (although the criteria did not specify a minimum number of days). Ineligibility criteria included major medical issues (e.g. complications of heart disease), Type 1 diabetes and recent weight loss of ≥4.5 kg. Ethics approval was obtained from the Institutional Human Research Ethics Committee. Written informed consent was obtained from the fathers prior to their participation as well as child assent.

The HDHK intervention

The aims of the HDHK intervention were to assist fathers achieve their personal weight loss goals and influence the lifestyle behaviors of their children. Table 1 outlines the content of each session and the resources provided to families. The HDHK intervention involved fathers attending seven consecutive weekly group sessions (90 min each); four sessions were for fathers only, and three practical sessions involved both fathers and their children. Sessions were conducted in local schools from 6.00 to 7.30 pm and both practical and theoretical sessions were delivered by two trained local Physical Education teachers who had completed an 8-hour training course (delivered by PJM). Both facilitators attended all program sessions with the lead facilitator's main role to deliver all learning experiences. The co-facilitator provided a supporting role during all sessions (e.g., equipment provision, management of group-based activities), administrative support prior to sessions (participant weigh-in, attendance sheets and homework compliance) and following sessions (participant feedback questionnaires). The co-facilitator ran the activities for the children at the beginning of each dads-and-kids session while the lead was reviewing the previous session and explaining the current session with the fathers.

The HDHK intervention was based on Social Cognitive Theory (SCT) (Bandura, 1986) and Family Systems Theory (FST) (Golan and Weizman, 2001). The following SCT constructs were operationalized: self-efficacy, goals/intention, outcome expectations, perceived facilitators and barriers to changes, and social support. FST is a theoretical framework that postulates reciprocal relationships among family members; that is, when a parent changes his or her physical activity and dietary behaviors this will be reflected in the child's behavior (Golan et al., 1998). HDHK taught fathers about the importance of spending quality time with their children and used healthy eating and physical activity as the engagement medium. The fathers' physical activity sessions emphasized modeling, co-physical activity that engaged both father and child(ren), reinforcing and providing opportunities for physical activity and overcoming barriers. The four major focus areas of the father/child(ren) practical sessions were (i) fundamental movement skills (Lubans et al., 2010), (ii) rough and tumble play (Fletcher et al., 2011), (iii) health-related fitness (Ortega et al., 2008), and (iv) fun and active household and backyard games.

The program provided a focus on an authoritative parenting style to facilitate better dietary and activity choices for children (Sleddens et al., 2011) and was informed by the dietary program from the HIKCUPS child obesity intervention (Collins et al., 2011; Okely et al., 2010). Sessions on healthy eating for families focused on multiple aspects of parental influence on children's dietary intake and incorporated Satter's 'trust' paradigm (Satter, 1996). The weight loss component of the HDHK intervention was adapted from the SHED-IT program, which is a weight loss program that has been specifically tailored for men and extensively developed and validated in previous qualitative and quantitative research (Morgan et al., 2009, 2011c, 2013).

Outcomes

Assessments were conducted 1–2 weeks before program commencement and following the program. The primary outcome was fathers' body weight at 14-week follow-up. Of note, although the HDHK program ran for seven consecutive weeks, there was no contact with participants during weeks 8–14. A brief description of both primary and secondary outcome measures is described in Table 2; further detail is provided elsewhere (Morgan et al., 2011d).

Sample size and randomization

The sample size for the RCT was based on 80% power to detect a significant weight loss difference between groups of 3 kg, assuming SD = 5 (Morgan et al., 2011a) ($P = .05$, two-sided), therefore a sample size of 50 fathers was required, assuming a 20% attrition rate (Morgan et al., 2011b).

The random allocation sequence was generated using a computer-based random number-producing algorithm. To ensure concealment, the sequence was generated by an independent statistician who did not have any contact