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Research report

Kid's Choice Program improves weight management behaviors and weight status in school children☆

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ABSTRACT

The present study examined the effectiveness of the Kid's Choice Program (KCP) for increasing children's weight management behaviors, and decreasing body mass index percentile (BMI%) for overweight and average-weight children. It also evaluated KCP characteristics relevant to long-term application in schools. Participants included 382 children assigned to two groups: a KCP group that received token rewards for three "Good Health Behaviors" including eating fruits or vegetables first at meals (FVFIRST), choosing low-fat and low-sugar healthy drinks (HDRINK), and showing 5000 exercise steps recorded on pedometers (EXERCISE), or a control group that received token rewards for three "Good Citizenship Behaviors." School lunch observations and pedometer records were completed for one month under baseline and three months under reward conditions. The school nurse calculated children's BMI% one year before baseline, at baseline, at the end of KCP application, and six months later. The KCP increased FVFIRST, HDRINK, and EXERCISE from baseline through reward conditions, with ANCOVAs demonstrating that these increases were associated with both the offer of reward and nearby peer models. Overweight (n = 112) and average-weight (n = 200) children showed drops in BMI% after the three-month KCP, but overweight children re-gained weight six months later, suggesting the need for more ongoing KCP application. HDRINK choice was the behavior most associated with BMI% drops for overweight children. Small teams of parent volunteers effectively delivered the KCP, and school staff endorsed parent volunteers as the best personnel to deliver the KCP, which costs approximately two U.S. dollars per child per month of application.

Introduction

School-based programs for child obesity prevention

Over 30% of American school-aged children are now overweight or obese (Wang & Beydown, 2007) and they face a number of health, social, and psychological problems. These problems include diabetes, high blood pressure, gallstones, sleep apnea, orthopedic abnormalities, menstrual irregularities, peer teasing, fewer friends, poor body image, and depression (Davison & Birch, 2001; Latner & Stunkard, 2003; Must & Strauss, 1999; Turnbull, Heaslip, & McLeod, 2000; Williams, Bulli, & Deckelbaum, 2001). To avoid problems associated with child obesity, the Centers for Disease Control and Prevention (CDCP, 2000) have recommended that children maintain a body mass index percentile (BMI%) between the 10th and 85th percentile for their age and gender (with values above the 85th percentile considered at risk for overweight and values over the 95th percentile considered obese). The CDCP (2000) recommends that to maintain a healthy weight, children should be encouraged to exercise daily (EXERCISE), to choose low-fat and low-sugar foods and healthy drinks (HDRINK), and to eat more fruits and vegetables (FV) because they are high in nutrients and relatively low in calories. Eating FV first during meals (FVFIRST) may be especially valuable because it may reduce the total mealtime calories consumed (Rolls, Roe, & Meengs, 2004), increase the percentage of mealtime calories contributed by the nutrient-rich FV, and enhance the palatability of FV for children because they would be eaten at the beginning of the meal when children are most hungry (Hendy et al., 2008; Rolls, Rolls, Rowe, & Sweeney, 1981; Spill, Birch, Roe, & Rolls, 2010).

The healthy behaviors recommended by the CDCP are often the focus of clinical programs available in hospitals or special camps for overweight children. However, any new behaviors learned in these special settings may not always generalize to children's everyday

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environments, and children may feel singled out from their peers when required to participate in these special programs. Because most American children eat lunch at school five days a week (James, Rienzo, & Franzee, 1996), with the school-provided lunch often providing their most frequent exposure to fruits and vegetables (Baranowski et al., 1997; Burchett, 2003), school-based programs for child obesity prevention offer a unique opportunity to encourage many children at the same time to develop healthy behaviors while in their everyday environment, and while in the company of their peers. Unfortunately, although most schools include health education in their curriculum, research suggests that education alone may improve children's knowledge about healthy behaviors, but it has little impact on their actual behavior or weight status (Burchett, 2003; Contento, Balch, & Bronner, 1995). In addition, reviews of the available school-based programs (Blanchette & Brug, 2005; Budd & Volpe, 2006; Howerton et al., 2007; Knai, Pomerlau, Lock, & McKee, 2006) suggest that very few of them produce well-documented improvements in children's food consumption, exercise, or BMI%. For example, many of these programs rely on self-report by children, parents, or teachers, rather than direct measurement of the outcome variables. Also, most improvements produced by school programs tend to last only as long as the program is in place, and the programs often include many complex components that reduce their acceptability for long-term application by busy parents and school staff (Bauer, Yang, & Austin, 2004; Burchett, 2003; Contento et al., 1995). Finally, no available school program documents the costs per child per month of application.

The Kid's Choice Program

The Kid's Choice Program (KCP) was developed as an easy-to-use and relatively inexpensive school-based intervention to improve well-documented changes in children's weight management behaviors. The KCP shows promise for long-term adoption by schools because it improves weight management behaviors in children (such as eating FV and choosing low-fat and low-sugar healthy drinks) for 1st–4th grade children, for boys and girls, for fussy-eating children, and for both average-weight and overweight children (Hendy, Williams, and Camise, 2005; Hendy, Williams, and Camise, 2011; Hendy et al., 2007, 2008). It also increases children's self-reported preference ratings for these healthy behaviors, it is simple in design, it is relatively low-cost (at approximately two U.S. dollars per child per month of application), and it is well-accepted by children and parents (Hendy et al., 2005, 2007, 2008). The KCP includes three simple school procedures: (1) children wear nametags during school lunch and recess, (2) star-shaped holes are punched into the nametags when children exhibit small amounts of specific weight management behaviors, with at least two choices being available for each behavior, and (3) Reward Days are presented once each week when children can trade their stars for small prizes.

Each component of the KCP was chosen based on theory and past research results in support of theory. For example, Social Cognitive Theory (Bandura, 1997) suggests that children's development of any behavior (including weight management behaviors such as FVFIRST, HDRINK, and EXERCISE) would be increased by offering them rewards as an incentive to try the new behaviors, and many studies have documented that offers of small rewards can increase children's FV consumption (Baranowski et al., 2000; Davis et al., 2000; Hendy, 1999; Horne, Fergus-Lowe, Fleming, & Dowey, 1995; Perry et al., 1998; Reynolds et al., 2000). Social Cognitive Theory also suggests that children's confidence to perform behaviors (including weight management behaviors) would increase if they are provided with many small experiences with these behaviors, and past research demonstrates that children require approximately 8–10 taste experiences over time to learn to enjoy new foods (Birch, McPhee, Shoba, Pirok, & Stineberg, 1987; Wardle, Herrera, Cooke, & Gibson, 2003). However, to avoid the aversive effects of satiation, these repeated tastes may need to be relatively small in the amount of food consumed, with some choices available (Rolls et al., 1981). Self Determination Theory (Deci & Ryan, 1985) also suggests that a child's intrinsic motivation for any behavior (including weight management behaviors) would be enhanced by perceived choices surrounding the behavior, and past research has documented that the availability of FV choices increases children's consumption of these healthy foods (Hendy, 1999; Perry et al., 2004). Finally, both Social Cognitive Theory (Bandura, 1997) and Group Socialization Theory (Harris, 1995) emphasize the importance of peer models for the development of any new behavior in children, and past research consistently demonstrates the effectiveness of peer models for increasing children's FV consumption (Hendy, 2002; Hendy & Raudenbush, 2000; Horne et al., 1995).

Purpose of the present study

The purpose of the present study was to strengthen the KCP application with a number of new components that allow additional evaluations of the program as a possible weight management program for long-term adoption by schools. (1) To strengthen the KCP application and its possibility of improving children's weight status, we extended it from a one-month application as in our previous research (Hendy et al., 2005, 2007, 2008, 2011) to a three-month application, as well as extending the number of weight management behaviors targeted from two behaviors (FVFIRST and HDRINK) to three behaviors (FVFIRST, HDRINK, and EXERCISE). (2) To make the KCP more of a school–home partnership for child obesity prevention and healthy children, we added an optional component of parent participation for which parents could use a weekly Parent Record to report children's weight management behaviors (FVFIRST, HDRINK, and EXERCISE) in the home environment. (3) To understand more about which components of the KCP were most associated with changes in the three weight management behaviors, we added an analysis of covariance to examine separate effects for the offer of token reward and the presence of peer models. (4) Most importantly, because the present KCP application targeted more weight management behaviors and for a longer duration than previous KCP applications, we added an examination of whether the KCP could improve BMI% scores for overweight and average-weight embedded within the sample. (6) In addition, we added an analysis to determine which of the three weight management behaviors (FVFIRST, HDRINK, and EXERCISE) explained the most variance in any significant BMI% changes seen for the overweight and average-weight children.

Besides the new procedures used to examine the effectiveness of the KCP for improving weight management behaviors and BMI% in school children, the present study added analyses to provide school administrators with information to guide decisions about adopting the KCP for long-term application. (1) We included an examination of whether the KCP could be validly and effectively delivered by small teams of two to four parent volunteers. (2) We added a brief questionnaire for school staff to determine their acceptability ratings for various KCP procedures. (3) We provided estimations of the dollar costs per child per month of KCP application, with suggestions for additional cost reductions.

Methods

Participants

The present application of the Kid's Choice Program was conducted in an elementary school in a small town in eastern