



The consequence of encouraging girls to be active for weight loss

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ABSTRACT

The purpose of the study, conducted in Pennsylvania, USA, was to assess the prospective effect of parental encouragement of physical activity (PA) for weight loss on adolescent girls' concern about weight, Body Mass Index (BMI) and objectively-measured PA. Non-Hispanic White girls ($N = 177$) and their parents were assessed when girls were 9, 11, 13 and 15 years old. At each age, girls' concern about their weight, pubertal development, BMI, and dietary intake were measured along with mothers' and fathers' encouragement of PA for weight loss, modeling of PA, and logistic support for PA. At ages 13 and 15 years, girls' PA was assessed using accelerometry. At age 11, girls' PA was measured using a combination of self-report measures and a standardized assessment of cardiovascular fitness. Parents of obese girls reported the highest encouragement of PA for weight loss; however, girls from all weight categories were exposed to encouragement of PA for weight loss and showed similar age-related increases in parental encouragement. Encouragement of PA for weight loss was prospectively associated with higher concern about weight and higher BMI, independent of pre-existing levels of these constructs and covariates. Encouragement of PA for weight loss was not associated with girls' objectively-measured PA. Parental encouragement of PA for weight loss was therefore not an effective strategy in this sample. Findings are consistent with research on parental child feeding practices, where parental control has been linked with unintended negative dietary and psychosocial outcomes among children.

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A considerable body of research documents the important role that parents play in promoting active lifestyles among children. As outlined in reviews by Gustafson and Rhodes (2006) and Pugliese and Tinsley (2008), children and adolescents are more physically active when their parents are active, encourage them to be active, are active with them, and tell them that being active is good for their health. Parents also facilitate children's physical activity (PA) by taking them to places where they can be active and enrolling them in organized activities and paying the associated fees. One form of parental support that has not been addressed to date is parental encouragement of PA for weight loss. Given that approximately 1 in 3 children in the US are overweight or at risk of overweight (Hedley et al., 2004), it is important to examine the effectiveness of this strategy for promoting PA and reducing children's risk of overweight.

Childhood obesity is recognized as a serious public health problem (Evans, Finkelstein, Kamerow, & Renaud, 2005; Napier, 2006). With regard to the origins of obesity, there is widespread belief that parents are responsible for obesity among children (Evans et al., 2005). This perspective reflects the strong emphasis in

the American culture placed on individual responsibility over one's own lifestyle and that of their children. The willingness to prescribe blame to parents places parents in a defensive position and may increase the likelihood that they actively encourage weight loss in their children. Promoting PA for weight loss is a likely strategy in this situation given its known health benefits (U.S. Department of Health and Human Services & Healthier U.S.Gov, 2008). Encouraging children to be active to induce weight loss or retard weight gain may also be a message that is reinforced by health professionals (American Academy of Pediatrics, 2003). Although encouragement of PA for weight loss may be well-intentioned and seemingly justified, there is little information on the potential impact of this message on children's health and well-being. Therefore, this study examines the effect of parental encouragement of PA for weight loss on girls' subsequent concern about weight, objectively-measured PA and BMI.

In the absence of prior research on this topic, the expected effect of parental encouragement of PA for weight loss on child health outcomes can be extrapolated from research on parental child feeding practices. While research in general supports the positive role that parental involvement can play in the treatment of childhood obesity (Golan, 2006), research from non-clinical samples indicates that parenting strategies that promote dieting or restrict access to specific foods have counterproductive effects. For example,

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parental encouragement of dieting has been linked with increased body concerns among adolescent girls and boys, including increased drive for thinness and increased body dissatisfaction (Wertheim, Martin, Prior, Sanson, & Smart, 2002). Similarly, research indicates that restricting children's access to specific foods to promote weight loss or prevent weight gain is associated with greater consumption of the restricted foods when control is removed (e.g., when parents are not present), negative self-perceptions when eating the target foods, and accelerated weight gain (Birch & Fisher, 2000; Carper, Fisher, & Birch, 2000; Fisher, Mitchell, Smiciklas-Wright, & Birch, 2002; Savage, Fisher, & Birch, 2007). Furthermore, there is evidence that pressuring children to eat specific foods (e.g., vegetables) is linked with decreased consumption of such foods and higher dietary fat intake (Savage et al., 2007). This research suggests that parental child feeding strategies that are controlling or coercive and which center around children's body weight are linked with negative psychosocial outcomes among children, particularly girls, and further increase their risk of overweight. Extrapolating these findings to PA-related parenting, it is predicted that encouraging girls to be active for the explicit purpose of weight loss will be associated with higher concern about body weight, lower PA, and higher BMI among girls.

In summary, the current study examines the impact of parental encouragement of PA for weight loss on girls' subsequent weight concerns, BMI and PA in a longitudinal sample of girls assessed at ages 9, 11, 13, and 15 years. The objectives of the study are to (1) assess girls' age and weight status as predictors of parental encouragement of PA for weight loss and (2) assess the lagged, prospective effect of encouragement of PA for weight loss on girls' concern about weight, objectively-measured PA and BMI. In order to make full use of the data available, the research questions are addressed using individual growth modeling. Based on research on parental child feeding strategies, it is anticipated that girls who are encouraged to be active for weight loss will exhibit greater concern about their weight, higher BMI, and lower moderate-to-vigorous PA (MVPA) independent of important covariates.

Methods

Participants

Families were part of a longitudinal study examining girls' health and development across ages 5–15 years. The study began in 1996 and concluded in 2007. Families residing in Central Pennsylvania, USA, were recruited for the longitudinal study using flyers and newspaper advertisements. Families with age-eligible female children within a 5-county radius also received mailings and follow-up phone calls. Participants for this study include 183 non-Hispanic white girls and their mothers and fathers who were assessed when girls were 9 years old (M age $9.34 \pm .3$) and invited to complete follow-up assessments when girls were ages 11, 13, and 15 years old. The number of families who participated in each follow-up assessment was as follows: 177 families at age 11 (M age $11.34 \pm .3$); 168 families at age 13 (M age $13.33 \pm .3$); and 165 families at age 15 (M age $15.34 \pm .3$). Girls and their families who did not participate in the study beyond age 9 ($N = 15$) were not included in the analyses, resulting in a final sample size of 177 families. No differences in parental encouragement of PA for weight loss or girls' BMI, or weight concerns were identified for girls who did and did not participate in the study beyond age 9.

This study was part of a larger longitudinal study examining familial influences on girls' evolving dietary patterns and health-related outcomes. In addition to encouraging PA for weight loss, more positive forms of parental support for girls' PA were also assessed. Encouraging PA for weight loss was not a focus of the

study. The Institutional Review Board of Pennsylvania State University approved all study procedures. Parents completed informed consent forms for themselves and their daughters at study onset and at each time of assessment as necessary due to modifications to the study protocol (i.e., the inclusion of new measures). Starting at age 11, girls also provided written assent.

Procedures

During summer of the years girls turned 9, 11, 13, and 15 years old, parents and girls visited the General Clinical Research Center at Pennsylvania State University to complete self-report questionnaires and have their height and weight measured. Parents completed the questionnaires independently. Girls were individually administered the questionnaires by trained assistants at age 9 and completed the questionnaires independently at ages 11, 13, and 15 with guidance from research assistants. In addition, when girls were 13 and 15 years old, research personnel visited girls during early fall (i.e., September and October) at their homes or at their schools to explain the accelerometer protocol and distribute the monitors. Monitors were returned by registered mail. All accelerometer data were collected between September and mid November to ensure that cold weather did not prevent girls from being active outdoors.

Measures: independent variable

Encouragement of physical activity for weight loss

In the absence of a previously validated questionnaire of encouragement of PA for weight loss, a measure was developed for this study. At each time of assessment, mothers and fathers were asked to respond to each of the following questions using a 4-point response scale (0 = definitely not; 3 = a lot/definitely): (1) Have you ever talked to your daughter about how to exercise to lose weight?; (2) Have you ever encouraged your daughter to exercise more in order to lose weight; and (3) Have you ever put your daughter on an exercise program to lose weight? Scores for the three items were averaged at each age. Results from preliminary analyses showed few differences in the relationship between maternal and paternal encouragement of PA for weight loss and key outcomes of interest. In addition, mothers' and fathers' reports were significant correlated at each age ($r = .60$ or higher, $p < .001$). Therefore, scores for mothers and fathers were averaged at each age to create a single parental encouragement score. The internal consistency coefficient for parental encouragement of PA for weight loss was $\alpha = .85$ or higher at all times of assessment.

Measures: dependent variables

Concern about weight

At each time of assessment, girls' concern about their weight was assessed using the Weight Concerns scale (Killen et al., 1994). This scale includes five items which assess girls' fear of weight gain, worry about weight and body shape, and perceived fatness. Girls responded to each item using a 5-point response scale, with high scores indicating high concern about weight. Previous research supports the scale's concurrent and predictive validity in adolescent populations (Killen et al., 1994). Given that the Weight Concerns Scale was originally developed for preadolescent and adolescent populations, a simplified version of the scale was administered to girls at age 9. In the amended version, the response scale was reduced from a 5-point scale to a 3-point scale. The internal consistency coefficients in this sample were $\alpha = .63$ (age 9), $\alpha = .78$ (age 11), $\alpha = .84$ (age 13), and $\alpha = .88$ (age 15).

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