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Teachers' Influence on Weight Perceptions in Preschool Children

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ABSTRACT

Aim: This study examined the influence of teachers, mothers, and children themselves on weight misperceptions of preschool children.
Background: Preschool children should have correct perceptions of their weight and develop a positive body image and healthy weight-control behaviors throughout childhood.
Methods: This study used a descriptive cross-sectional design based on the biopsychosocial model. We analyzed 388 triads of Korean children aged 3–6 years, their mothers, and teachers.
Results: Children's body mass index (BMI) and weight satisfaction, mothers' BMI; teachers' education level, BMI, perception of and satisfaction with children's weight, body image, and attitude toward obesity were predictors of children underestimating their weight. Mothers' education level and BMI; teachers' BMI, satisfaction with children's weight, and body image were predictors of children overestimating their weight.
Conclusions: Teachers influence weight misperceptions of preschool children. Intervention programs for teachers should incorporate more accurate perceptions of children's weight and promote healthy body image.

1. Introduction

Preschoolers are in an age period critical for the formation of attitudes and prejudices about body size and appearance (Holub, 2008). At about this age, children begin to recognize body sizes through subjectively perceived body images rather than simply objective body sizes (Holub, 2008). Thus, preschool children are at risk for developing weight misperceptions (Wong, Chang, & Lin, 2013).

Self-awareness or the ability to represent one's body size seems to emerge in the second year of life and continues to develop until the third year (Brownell, Nichols, Svetlova, Zerwas, & Ramani, 2010). Furthermore, preschool children tend to internalize negative social attitudes toward being overweight and misperceive their weight to maintain self-esteem (Cramer & Steinwert, 1998). Similarly, it was confirmed that the majority of overweight preschool children underestimated their body size (Tremblay, Lovsin, Zecevic, & Larivière, 2011). Weight misperceptions that develop during early childhood are difficult to modify and are likely to persist through adolescence (Littleton & Ollendick, 2003). Furthermore, weight misperception formed in early childhood indicates the formation of an inappropriate body image and can lead to unhealthy weight-control behavior in late childhood and adolescence (ter Bogt et al., 2006). According to Davison, Markey, & Birch (2003), body weight and shape concerns in children at an age of 5 years predicted body image concerns at ages 7 and 9, and body image dissatisfaction at ages 5 and 7 predicted restrictive eating behaviors and attitudes toward eating at age 9. Thus, it is important to ensure that preschool children have accurate and appropriate perceptions of their own weight and that they develop a positive body image and healthy weight-control behaviors throughout childhood.

According to the biopsychosocial model, a child's weight perception is influenced by biological factors (e.g., age, gender, body mass index [BMI]), psychological factors (e.g., degree of satisfaction with his or her body size), and sociocultural factors (e.g., mother's concern about the child's weight, mother's satisfaction with her own body) (Fredrickson, Kremer, Swinburn, de Silva-Sanigorski, & McCabe, 2013). Indeed, a child's weight perceptions can be strongly influenced by his or her mother as the primary caregiver. However, as the rate of children receiving care in preschool increases, preschool teachers are becoming especially critical for health promotion among young children (Larson, Ward, Neelon, & Story, 2011). Due to the expansion of educational support for infants and toddlers for dual-career couples, 86% of 3- to 6-year-old preschool children in South Korea are enrolled in care-center/educational facilities (Korea Ministry of Health and Welfare, 2013; Sohn, 2014). Thus, similar to mothers, preschool teachers are caregivers that can critically affect children's weight perceptions. Previous studies have mostly focused on the impact of mothers on preschool children's weight perceptions (Chaparro, Langellier, Kim, & Whaley, 2011; Chen,

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Binns, Maycock, Zhao, & Liu, 2014). The purpose of this study was to identify factors associated with weight misperception in preschool children, including individual, maternal, and teacher-related factors.

2. Methods

2.1. Design and Theoretical Model

This study used a descriptive cross-sectional design based on the biopsychosocial model of Engel (1980). The factors of potential influence included in this study were (1) the biological factors: gender (Niu, Seo, & Lohrmann, 2014) and children's BMI (Intagliata, Ip, Gesell, & Barkin, 2008); (2) the psychological factor: children's satisfaction with their own weight (Fredrickson et al., 2013); and (3) sociocultural factors: socioeconomic level of the children's family (Fredrickson et al., 2013; Wong et al., 2013), mothers' and teachers' BMI (Wong et al., 2013), mothers' and teachers' education level (Wong et al., 2013), mothers' and teachers' perceptions of children's weight (Kaufman-Shriqui, Fraser, Novack, et al., 2012), mothers' and teachers' satisfaction with children's weight (Niu et al., 2014; Wong et al., 2013), mothers' and teachers' body image (Hyun & Hong, 2005), and mothers' and teachers' attitudes toward obesity (Damiano et al., 2015).

2.2. Setting and Participants

We recruited participants between April and June 2014. Kindergartens were recruited by placing a participation advertisement on the Web site of the Korean Association of Public Kindergarten Teachers. Five kindergartens located in Daejeon, South Korea (each with more than 100 children) were selected using a convenience sampling method. Participants from each site were recruited by convenience and included all individuals agreeing to take part in the study who were able to complete our questionnaire. Healthy preschool children with normal development were enrolled. Overall, our study included 388 triads of children aged 3–6 years (n = 388), their mothers (n = 388), and their preschool teachers (n = 23).

2.3. Variables and Measures

2.3.1. Preschool Children's Perceptions of Their Weight

Children's perceptions of their weight were measured using a pictorial instrument developed by Collins (1991) that involved presenting a scale of seven pictures of children's body shapes (assigned integer *z*-scores between −3 and 3). The fourth (center) picture on the scale was of a child with a standard weight (*z*-score of 0). Scores between −1 and 1 indicated normal weight; −2 and −3 indicated underweight; 2 indicated overweight; and 3 indicated obesity. Each child viewed images of seven child body shapes and was asked to select the picture that best reflects their current appearance. Children's perceptions of their weight were evaluated using a score by subtracting their BMI *z*-score from the conversion *z*-score of their perceived-current-appearance image. A difference of 0 indicated that children had a correct perception of their own current weight. Negative and positive difference scores indicated underestimation and overestimation of their own weight, respectively. Collins's (1991) instrument had been previously validated for the evaluation of body perception in Asian preschool children (Ambrosi-Randic & Tokuda, 2004; Wong et al., 2013). The overall correlation between the pictorial rating scale score and BMI was 0.35 for preadolescent children (Collins, 1991).

2.3.2. Biological Factors

Children's gender and BMI were evaluated as biological factors. BMI was assessed by two master's-degree-level nurses. They measured children's height and weight using a stadiometer and a scale (Tanita Um-075, Tanita Corp, Japan), estimating to the nearest 0.1 cm and 0.1 kg. BMI is calculated as weight (in kilograms) divided by height (in meters squared), converted to a percentile, and classified into underweight (<5th percentile), normal weight (≥5th and <85th percentile), overweight (≥85th and <95th percentile), or obese (≥95th percentile), using the gender- and age-specific growth chart for Korean children (The Korean Pediatric Society, 2007).

2.3.3. Psychological Factors

Children's satisfaction with their weight was assessed with same instrument used for the measurement of their current weight perception (i.e., Collins, 1991). Children's satisfaction with their own weight was evaluated by subtracting the conversion *z*-score of the picture that they perceived most closely resembled themselves from the *z*-score of the image chosen as their ideal body shape. A difference of 0 indicated that a child was satisfied with his or her weight relative to his or her ideal body shape, while negative and positive scores indicated that the child felt that he or she should weigh less or more, respectively.

2.3.4. Sociocultural Factors

Sociocultural factors included monthly family income (socioeconomic level), and both mothers' and teachers' BMI, education level, body image, perception of the child's weight, satisfaction with the child's weight, and attitudes toward obesity. Mothers' and teachers' BMI was assessed in the same fashion as the children's. According to criteria recommended by the Korean Society for the Study of Obesity (Ou et al., 2002), the BMIs of mothers and teachers were classified into underweight (<18.5 kg/m^2), normal weight (≥18.5 kg/m^2 and <23 kg/m^2), overweight (≥23 kg/m^2 and <25 kg/m^2), or obese (≥25 kg/m^2).

Mothers' and teachers' perceptions of and satisfaction with children's weights were assessed using the same instrument as for the children's perception. Each mother and teacher was asked to choose (a) the body shape that most closely resembled their child and (b) the body shape she or he thought was optimal. These were evaluated and scored using the same method as for children's perceptions of and satisfaction with their own weight.

Body image of mothers and teachers was assessed using the Body Shape Questionnaire (Cooper, Taylor, Cooper, & Fairbum, 1987), which was translated into Korean and tested for validity and reliability by Noh & Kim (2005). It consists of 34 self-report questions answered on a scale from 1 (*hardly/scarcely*) to 6 (*always*). Possible scores range from 34 to 204. Higher scores indicate greater concern for one's body shape and a more negative body image. Noh & Kim (2005) reported Cronbach's alpha values of .95. Cronbach's alpha score in the current study was .96.

The attitudes of mothers and teachers toward obesity were assessed using the short-form version of the Fat-Phobia Scale (Bacon, Scheltema, & Robinson, 2001), which was translated into Korean and tested for validity and reliability by Kim, Lee, Hwang, Kim, & Park (2010). The instrument consists of 14 pairs of adjectives that can be used to describe obese people (e.g., industrious–lazy). Each item is rated on a five-point scale. One point indicates the first adjective (e.g., industrious) and 5 points stand for the opposite (e.g., lazy) of the pair. Mean scores were calculated (ranging from 1 to 5) with greater scores indicating a more negative attitude toward obesity. Kim et al. (2010) reported a Cronbach's alpha of .79. In the present study, Cronbach's alpha was .84 in mothers and .78 in teachers.

2.4. Procedure and Ethical Considerations

Data collection was conducted from July to September 2014. Two trained research assistants collected data from children and their teachers in the kindergartens. The interview for the children was conducted individually according to a standardized procedure. The research assistants showed seven child figures of the same gender. They asked the children to indicate the self-body shape ("Which picture looks most like you?") and ideal body shape ("Which picture looks most like you want to look?"). A self-administered questionnaire was used to collect information on biological, psychological, and sociocultural factors from mothers and teachers. The research assistants explained how