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Parents' Underestimations of Child Weight: Implications for Obesity Prevention

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ABSTRACT

Obesity prevention efforts may be ineffective if parents lack awareness of their children's overweight status. This study examined the factors that predicted parents' underestimation of child weight status. Using a cross sectional design, researchers recruited children and parents in a local children's museum. Parents completed a demographic questionnaire, the Newest Vital Sign, and the Child Body Image Scale. Children's height and weight were measured to calculate child BMI. Random effects modeling examined the association between predictor variables (parent race/ethnicity, income, education, and health literacy, and child BMI percentile, gender, and age) and the dependent variable, parent underestimation of child weight status. Participants included 160 parents (213 children) representing a racially and ethnically diverse sample who were affluent, educated, and with 36.6% of parents assessed with limited health literacy. Although 45.1% of children were overweight/obese, only 7.5% of parents chose this weight status; 80% of parents underestimated the weight of their normal weight children, 96% of parents underestimated their overweight children, and 72% of parents underestimated their obese children. Parents were more likely to underestimate weight of older children and those under 81st percentile of BMI. No other predictors were significant. Parent underestimation of child weight status appears to be a widespread phenomenon in this sample, regardless of race, ethnicity, income, education, and health literacy. The consistent underestimation of child weight suggests that parents' misperception of weight status represents a critical pathway for intervention. Methods to improve parents' perception of child weight need be developed and tested.

Introduction

Approximately 1 in 5 children in the United States are obese, a trend that has remained steady over the last 10 years (Ogden et al., 2016). Given the increasing incidence of type 2 diabetes in children (Lipman et al., 2013) and the increased risk of hypertension, heart disease, arthritis, sleep apnea and premature death in adulthood associated with obesity (Hirko et al., 2015; Karnik & Kanekar, 2015), obesity prevention remains a public health challenge for nurses. Although national childhood obesity rates have somewhat leveled off, progress is frustratingly slow (Segal, Rayburn, & Martin, 2016). One reason for this delay may be that parents lack awareness of their child's overweight or obesity status. Previous studies have documented that over 60% of parents underestimated their child's weight status (Lundahl, Kidwell, & Nelson, 2014; Rietmeijer-Mentink, Paulis, Middelkoop, Bindels, & Wouden, 2013; Tompkins, Seablom, & Brock, 2015), a trend that appears to be increasing over time (Foster & Hale, 2015; Parry, Netuveli, Parry, & Saxena, 2008). Because parental engagement is central to effective interventions around weight management, parents' underestimation of their child's weight may be a barrier. When parents fail to recognize their child as overweight, they are less likely to participate in healthy lifestyle behaviors with their children (Lundahl et al., 2014).

The contextual factors that influence why parents underestimate the weight of their overweight or obese children are not well known (Foster & Hale, 2015). Recent studies have reported varied results for how social determinants of health including parental race, ethnicity, income, education, and child age and gender predict parents' underestimation of child weight status. Some studies reported significant associations between race, income (Black et al., 2015), and education (Towns & D'auria, 2009) and parent underestimation of child weight, while others did not find such associations (Doolen, Alpert, & Miller, 2009; Eckstein et al., 2006; Lundahl et al., 2014; Towns & D'auria, 2009; Warschburger & Kroller, 2009). Evidence on the relationship between child age and parent underestimation of child weight status is also mixed. Some have reported that parents were more likely to underestimate weight status when the child was younger (Lundahl et al., 2014; Rietmeijer-Mentink et al., 2013), while others reported more underestimation of weight status in older children (Black et al., 2015). Parents

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were more likely to underestimate overweight status in their boys, incorrectly classifying them as underweight or normal weight (Black et al., 2015; Lundahl et al., 2014; Towns & D'auria, 2009).

In one study, Garrett-Wright (2011) added parent health literacy as a predictor variable, finding that lower parent health literacy was significantly associated with parent's inaccurate estimation of child weight status. This first study to include health literacy was conducted using a sample of parents with preschool age children. Further exploration of how health literacy and other social determinants of health affect parent perception of child weight status in older, school age children extend upon the findings of this earlier study. Because parents presumably have influence over the healthy lifestyle behaviors for their family, the school-age years may present a critical time to target weight reduction or overweight/obesity prevention efforts.

The purpose of this study was to examine how health literacy and other social determinants of health predicted parents' underestimation of child weight status. Influenced by the ecological model proposed by Bronfenbrenner (1986), we hypothesized that parent factors (race, ethnicity, income, education, and health literacy) interacting with child factors (age, gender, and weight status) may influence parent underestimation of child weight status. A model of parent underestimation of child weight status was presented with both parent and child factors as predictor variables (Fig. 1).

Design and Methods

Sample

A convenience sample of children and their parent/guardian were recruited from a local children's museum of science and history. Inclusion criteria were children 7–13 years old and their parent/guardian who spoke sufficient English to participate in research activities. Exclusion criteria included children or parents who were not cognitively or physically able to participate in the research activities. The research team recruited participating children and parents on Tuesday evenings and Saturday afternoons in November–December 2016 for a total of 10 data collection times. Tuesday evening participants included school groups who attended Family Night at the museum free of charge, including bus transportation to and from the museum, allowing for a more diverse sample. The study was approved by Texas Christian University Institutional Review Board.

Procedure

Five to seven research team members, including nursing and nutrition faculty and students, were present during each data collection session. After completing written parent consent and parent permission/child assent, each parent completed a survey while anthropometric measurements were attained for each child; some parents had multiple children who met inclusion criteria and participated in the study. The research team completed the survey verbally with most parents, although parents who were assessed with adequate health literacy may have independently completed the demographic portion of the survey. Data collection took approximately 15 min.

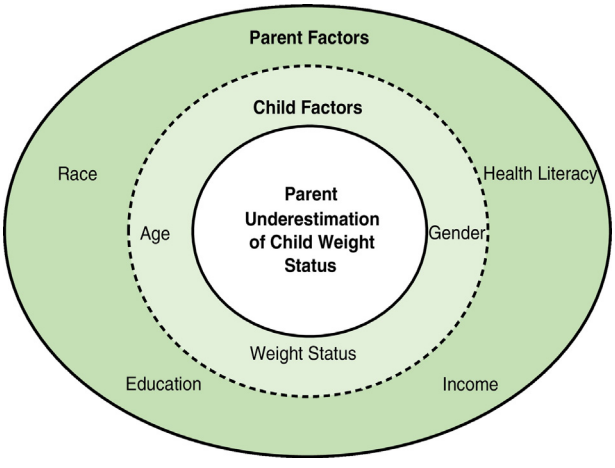

Fig. 1. Proposed model of parent underestimation of child weight. Dotted line indicates proposed interaction between Parent and Child factors.

Measurement

Demographic Characteristics

Parent characteristics (age, gender, marital status, race, ethnicity, income, years of education) and child characteristics (age, gender, grade in school) were recorded.

Anthropometric Measurements

Children's height and body weight were measured with no shoes and light clothing. Children's height was measured to the nearest 0.1 cm using a portable stadiometer (Hopkins #680215, Hopkins Medical Products®, Caledonia, MI, USA) and body weight was measured to the nearest 0.1 kg using a portable digital weight scale (seca 803, Chino, CA, USA) (World Health Organization, 2008). BMI was calculated from measured height and weight using BMI = kg / m^2, and expressed as BMI percentiles as per CDC guidelines for descriptive purposes, interpreting less than 5th percentile as underweight, 5th to 85th percentile as healthy weight, 85th to 95th percentile as overweight, and equal or greater than 95th percentile as obese (Center for Disease Control, 2015).

Perceived Child Body Size

Perceived child body size was measured with the Children's Body Image Scale (CBIS), a pictorial scale with 7 gender-specific prepubescent body pictures representing standard 3rd-97th BMI percentiles (Truby & Paxton, 2002). Body pictures were displayed on seven picture cards labeled A through G (labeled 1–7 for analysis), presented on individual cards in random order to parents. Perceived body size was determined by asking the parent to identify the picture that was most similar in size to their child's current body size. Test-re-test reliability of the CBIS has previously been reported in the range of 0.76–0.86 (Truby & Paxton, 2008).

Parent Underestimation of Weight Status

Each child's actual weight status was operationalized by converting child BMI percentile values to a corresponding figure on the Child Body Image Scale (1 to 7, representing BMI percentiles of 3rd–97th percentile). To determine the accuracy of perceived child body size, a discrepancy score of each child's actual weight status minus parent perceived weight status was calculated with a positive score indicating an underestimation of child weight status (Lampard, Byrne, Zubrick, & Davis, 2008). A discrepancy score of 0 indicated that parents accurately estimated their child's weight status. To ensure that the dependent variable measured parental underestimation of child body size, only parents with a discrepancy score ≥ 0 were included in the sample.

Newest Vital Sign (NVS)

Health literacy was assessed with the NVS, which consists of an ice cream food label with 6 accompanying questions. Scores range from 0 to 6. Descriptive statistics present scores as an ordinal variable, interpreting scores 0–1 as high likelihood of limited health literacy, scores 2–3 as the possibility of limited health literacy, and scores 4–6 as adequate health literacy. For univariate correlations and the random effects analyses, NVS was entered as a continuous variable. The NVS has adequate reliability (α 0.76–0.79) and good criterion validity has been established with the full version of TOHFL-A (Driessnack, Chung, Perkhounkova, & Hein, 2013). The NVS takes <3 min to complete.

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