



My Weight Ruler: A simple and effective tool to enhance parental understanding of child weight status



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ABSTRACT

Objective. To compare caregiver identification and understanding of body mass index percentile (BMI%) using the CDC Growth Chart and a newly adapted BMI ruler ("My Weight Ruler").

Method. Between October 2009 and March 2010, eight focus groups with 27 low-income, minority caregivers with children 2–4 years of age were conducted to choose a meaningful tool to explain child weight status. A within-subject experiment comparing identification and interpretation of 2 BMI% plots (50th and 97th%) using the CDC Growth Chart and the selected tool was performed in February 2012 with 251 primary caregivers of children 2–4 years in a primary care clinic.

Results. Caregivers chose the "BMI Ruler" a tool used in Arkansas, recommended culturally-responsive descriptors of weight status and renamed it "My Weight Ruler". 92% of caregivers reported having previously been explained the CDC Growth Chart; 37% correctly identified both plots. In contrast, 92% of caregivers correctly identified both plots on the My Weight Ruler and many interpreted the 97th% plot as a health risk and need to change behavior.

Conclusion. My Weight Ruler is a simple, easily understood tool of weight status for low-income, minority primary caregivers and could enhance parental knowledge and understanding of child weight status.

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Introduction

Rates of childhood obesity are high particularly in minority and urban populations (Anderson and Whitaker, 2009; Rossen and Schoendorf, 2012). Excessive weight and its related co-morbidities are the greatest public health threats facing the U.S. today (Finkelstein et al., 2010; Freedman et al., 2005; Wang et al., 2010; Whitaker et al., 1998). Because established obesity is difficult to treat and obese children often become obese adults, attention has shifted to preventing obesity especially in young children. Both parents and pediatricians have important roles in obesity prevention. Parents need to identify their children's weight problems and understand the accompanying short and long-term risks and they look to their pediatricians for advice and guidance (Hernandez et al., 2010). But parents and pediatricians often underestimate children's body size (Akerman et al., 2007; Chaimovitz et al., 2008; Jones et al., 2011; Lampard et al., 2008; Parry et al., 2008; Perrin et al.,

2005; Spurrier et al., 2006; Tschamler et al., 2010; Wald et al., 2007). Unrecognized obesity is especially high for obese parents, for overweight as compared to obese children (Taveras et al., 2011), for lower socioeconomic parents (Rivera-Soto and Rodriguez-Figueroa, 2012) and for Hispanics (Intagliata et al., 2008), African Americans (West et al., 2008) and Native Americans (Arcan et al., 2012) and could impair parental motivation to adopt weight control measures (Vuorela et al., 2010) and to participate in obesity reduction programs (Taveras et al., 2011).

The Centers for Disease Control (CDC¹) (Kuczmarski et al., 2000) and the American Academy of Pediatrics (Barlow, 2007) have recommended use of Body Mass Index (BMI²) Growth Charts to determine child weight status and many pediatricians use these growth charts to document and explain a child's weight status to parents (Ariza et al., 2009; Dilley et al., 2007). Parents, however, do not understand these growth charts (Oettinger et al., 2009). Ben Joseph found that only 64% of parents could identify a child's weight status when plotted on a growth chart (Ben-Joseph et al., 2009). If recognition is an important step in reversing the obesity epidemic, then better ways of explaining weight to parents and/or new tools are needed.

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¹ CDC – Centers for Disease Control.

² BMI – Body Mass Index.

The goal of this study was to use focus groups with caregivers to determine whether currently available but not well tested tools (Eckstein et al., 2006) for weight status could be used by low-income parents of young children and to compare parental identification and understanding of weight status using the selected tool to the CDC Growth Chart in communicating obesity risk. We hypothesized that a modified tool, developed with caregivers, would be easy to understand and might better communicate health risk and motivate parents to more actively engage in behavior change. Use of a novel tool could be an important first step in childhood obesity prevention and treatment.

Materials and methods

Qualitative methods (focus groups) were used to determine the preferred tool and the preferred descriptors used for explaining child weight status to caregivers. The preferred tool and descriptors were then tested in a group of diverse caregivers and compared to the current standard, the CDC BMI Growth Chart.

The study was approved by the Institutional Review Board at Connecticut Children's Medical Center.

Focus groups

Participants

Between October 2009 and March 2010, 27 caregivers (12 African American and 15 Hispanic) were recruited to participate in 8 focus groups designed to explore behavior change strategies for children with unhealthy eating and physical activity (*Steps to Growing Up Healthy*). Recruitment flyers were posted at locations that serve primarily a low-income, minority population including primary care clinics, Family Centers, Head Start and Child Care Centers in Hartford. Participants were eligible if they were the primary caregiver, either self-identified Hispanic or African American, spoke English or Spanish and had a child 2–4 years of age. Individuals without these characteristics were excluded. Three focus groups were conducted in Spanish and 5 were conducted in English.

Methods

Caregivers provided consent and completed questionnaires about themselves and the eating and activity behaviors of their 2–4 year old children. Participants self-reported their height and weight which were used to calculate their BMI and were asked if they perceived themselves as underweight (BMI <18.5), just right (BMI 18.5–25), slightly overweight (BMI 25–30) or very overweight (BMI > 30). Their child's height and weight were obtained from the child's medical record. Focus groups were held in the participant's language of choice and were conducted by bilingual, bicultural trained moderators and a note taker using a focus group guide (Table 1). Caregivers were shown 3 potential tools (the CDC Growth Chart (Oettinger et al., 2009), the Arkansas BMI Ruler (Arkansas School System) (Thompson and Card-Higginson, 2009) and a set of body figures (Chaimovitz et al., 2008)) to explain weight status in children and were asked what tool they would use to understand weight status and what words they would use to explain the different weight categories. All sessions were audio-taped and transcribed verbatim. Caregivers overwhelmingly preferred the BMI Ruler and changed its name to the My Weight Ruler. The My Weight Ruler is divided into 4 sections corresponding to 4 BMI% categories (<10th%, 11–84th%, 85th–95th% and >95th%). A child's individual BMI percentile is recorded as a vertical line on the ruler in the corresponding section and within the section at the approximate location of the BMI percentile.

Testing the modified tool

Participants

A convenience sample of 259 caregivers was approached in the waiting room of an urban Primary Care Clinic. Caregivers were eligible if they were the primary caregiver, had a child 2–4 years of age who was a patient of the clinic, were Hispanic or African American and spoke English or Spanish. Caregivers were excluded if they had participated in any of the project-related focus groups.

Methods

Of the 259 caregivers who were approached, 251 agreed to participate and provided consent. Participants were shown both the CDC BMI Growth Chart and the My Weight Ruler in random order and asked a series of questions

(Table 1) by a bilingual interviewer (PLR). For both tools, caregivers were asked if they had seen the tool previously, were given a brief explanation of the tool and were then asked to interpret two measurements that were plotted on the Growth Chart or Ruler. The measurements on both tools corresponded to the 50th percentile and the 97th percentile. Caregivers were asked what would this point (or line) mean to you in terms of your child's weight? Respondents then chose one of 4 responses—My child has the right weight; My child is underweight; My child is overweight; and I don't know. Caregivers were not provided with feedback on their responses and all comments were documented on standardized data entry forms. The interview concluded by asking caregivers for their preferred screening tool.

Analyses

Focus group data were analyzed using the template analysis style (Miles and Huberman, 1994). A working codebook (template) based on identified themes was created and applied to each transcript and updated and refined as needed. Tool preference was noted and weight category descriptors were noted. Validity was assessed by having two reviewers read each transcript and code them independently. Notes were then compared and consensus was reached. Descriptors recommended by one focus group were tested in subsequent focus groups until general consensus was obtained. The demographics of participants who tested the two tools were examined using descriptive statistics with calculation of means and standard deviations. Comparisons between responses to the My Weight Ruler and the CDC Growth Charts were made using Chi square testing. The Cochran–Armitage Trend test was used to examine trends in the data. We determined *a priori* that a sample size of 250 participants provided 90% power to determine a difference of 7% in the proportion of mothers who understood the My Weight Ruler and the proportion of mothers who understood the CDC Growth Chart. Statistical analyses were conducted using SAS 9.3 (SAS Institute, Cary, NC). A $p < 0.05$ was considered significant.

Table 1

Examples of focus group and interview questions.

Focus Group Conduct and Questions

We hear a lot today about the importance of being healthy.

1. What does it mean to be healthy?
How can you tell if a child is healthy?
2. How important is weight to you as a part of being healthy?
How can you tell if a child is overweight?
What would it take to make someone like yourself concerned about your child's weight?
3. Who should tell parents about their child's weight?
How should this information be shared with parents?
The facilitator then shows the participants 3 different ways that weight has been explained to parents
4. Tell me about each of these ways—what do you like and what do you not like about them?
Do you like one way better than the another?

When participants chose the BMI Ruler, the facilitator then described each of the sections on the Ruler and after each section the participants were asked what words they would use to describe this category.

Interview Questions

Has your child's doctor ever talked to you about your child's height and weight?

Has your child's doctor ever shown you a chart that has information about your child's height and weight?

The interviewer then says to the families: I am going to show you two ways that doctors explain a child's height and weight and then ask you several questions. For the BMI ruler: The ruler has different sections that will tell you about your child's weight. What does a line in this first section (*a BMI at the 50th%*) mean to you? What does a line in the second section mean to you (*BMI at the 95th%*)? For the CDC Growth Chart: Have you ever seen this kind of a chart before? This is a Growth Chart that is used to tell you about your child's height and weight. What does a point here along the 50th% mean to you? What does a point here along the 95th% mean to you (*BMI at the 95th%*)?

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