



Original article

Definitions of hunger and fullness among youth enrolled in a pediatric weight management program

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SUMMARY

The development and maintenance of obesity is multifactorial and involves the interplay of environmental, cultural, social, and biological influences. The purpose of the current paper was to describe hunger and fullness in a sample of pediatric patients seeking treatment for obesity. The goals of this study were to gain information about how youth with obesity describe their experience of being hungry and full and to explore common themes within these descriptions. Twenty-five patients entering a Stage 3 pediatric obesity program responded to the open-ended questions: “how do you know when you are hungry” and “how do you know when you are full?” The results found that the majority of youth used physical cues as a way to identify hunger and fullness cues. For identifying hunger, participants most frequently reported using cues such as their stomach growling or stomach pain as an indication that they are hungry. For identifying fullness, the majority of participants relied on discomfort. The current findings suggest that youth with obesity are able to attend to extreme physical cues (e.g., pain, sickness) of fullness but may not be aware of subtle cues that allow them to stop eating once they are satisfied.

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1. Introduction

Childhood obesity, defined as having a Body Mass Index (BMI) at or above the 95th percentile when compared to age and sex matched peers, has increased approximately 60 percent worldwide over the last twenty years [1,2]. Estimates suggest that, in the United States, 16.9% of individuals ages two through 19 are obese [3]. Childhood obesity is related to a number of significant health conditions including type 2 diabetes, cardiovascular disease, sleep apnea, cancer, and obesity into adulthood [4].

The development and maintenance of obesity is multifactorial and involves the interplay of environmental, cultural, social, and biological influences. Eating behaviors and awareness of internal eating cues appear to play an important role in childhood obesity [5–7]. Self-regulation describes an individual's ability to use internal cues of hunger and fullness to eat and stop eating [8]. The ability to self-regulate appears to be influenced by both innate and learned skills [8]. The two major components that comprise self-

regulation are satiation and satiety. Satiation describes the cues and processes that an individual uses over the course of a meal to identify when the meal is over, whereas satiety occurs after a meal ends and refers to the signals and processes that inhibit continued eating [8]. Internal cues of hunger inform eating habits and serve as important modifiers of eating behaviors, if and when, an individual is able to effectively attend to them. Given the important role of self-regulation in eating habits many family-based weight management programs provide behavioral interventions that help children and their caregivers pay attention to internal cues of hunger and external cues that promote eating/overeating in the obesogenic environment [9].

Research suggests that children with obesity find food more reinforcing than children who are not obese and have greater difficulty attending to cues about hunger and satiety [6,10–12]. Schachter's externality theory of obesity suggests that individuals with obesity are less sensitive to internal cues of hunger compared to lean individuals and are highly responsive to external food cues [9]. Previous research has explored youth's ability to attend to cues of hunger and fullness but little attention has been given to how youth define these terms. Knowing how a group of treatment seeking youth with obesity define hunger and fullness allows

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providers in clinical settings to evaluate how their individual patient's definitions compare and contrast. Providers can use this information to effectively communicate with patients and to tailor treatment recommendations that parallel their patient's baseline knowledge and understanding of internal hunger cues.

The purpose of the current paper is to describe hunger and fullness in a sample of patients seeking treatment for obesity. The goals of this study are to gain information about how youth with obesity describe their experience of being hungry and full and to explore common themes within these descriptions. To our knowledge no other studies have examined this research question; however, this study is critical to understanding the subjective experiences of youth with obesity and how providers can create a meaningful dialogue with their patients that can improve treatment plans and quality of care.

2. Materials and methods

2.1. Sample and study design

The current study was an evaluation of 25 patients entering a Stage 3 obesity program at a large children's hospital in the Northeast. Patient's responses to open-ended questions during an intake evaluation were coded using thematic analysis in an effort to learn how youth identify and define hunger and fullness. The open-ended questions were: "how do you know when you are hungry" and "how do you know when you are full?" Frequencies of patient responses were calculated and the most common answers were identified as themes for the purposes of this evaluation.

The study protocol and consent forms were approved by the institutional review board at Connecticut Children's Medical Center. Consent forms were read and reviewed with parent(s) or guardian(s) and were signed by the parent(s) or guardian(s) and patient assent was obtained upon agreement to participate.

3. Results

3.1. Patient demographics

The demographic characteristics of children are reported in Table 1. There were 25 participants, ages 7–17 (mean 12.19) included in the study. Of these, 36% identified as Hispanic/Latino, 32% Caucasian, 24% African American/Black, 4% Asian, and 4% did not identify. The BMI range was 27.76–48.22 (mean 34.4).

Hunger, "how do you know when you are hungry?"

3.1.1. Stomach making noise

A common theme that participants identified was that they knew they were hungry when their stomach grumbled, growled, or rumbled. Thirteen participants made note of their stomach making noise as either part of or their entire response.

Table 1
Patient demographics. Summary of participant's demographics including sex, age, and ethnicity.

	Overall (n = 25)
Female	14 (56%)
Male	11 (44%)
Mean age (in years)	12.9
Mean BMI	34.4
Hispanic/Latino	9 (36%)
White/Caucasian	8 (32%)
African American	6 (24%)
Asian	1 (4%)

"My stomach growls at me."

"My stomach starts grumbling so I eat what my mom cooked or I eat cheez-its or crackers."

"When my stomach starts grumbling or hurting."

3.1.2. Discomfort

Another common response was making mention of pain, sickness, or discomfort. Six participants identified some form of discomfort in their response.

"When my stomach growls and I feel sick."

"My stomach hurts but I eat even when it doesn't hurt."

"My stomach hurts because I'm hungry."

"I don't know. I'm just hungry. My stomach will hurt or I'll get bored and want to eat."

3.1.3. Uncertainty

Four participants displayed a difficult time verbalizing or identifying when they are hungry.

"I don't know. Dinner?"

"I don't know, I constantly snack sometimes."

In response to the question "how do you know when you are hungry?" participants most frequently reported that they rely on physical cues such as their stomach grumbling or physical discomfort. The majority of participants mentioned cues in their stomach or belly as signs that they are hungry.

Fullness, "how do you know when you are full."

3.1.4. Discomfort

Discomfort was the most frequent response to this question, with seventeen (68%) participants making some mention of pain, discomfort, or that their body was at its capacity for food intake.

"When I eat another bite my stomach starts hurting and I know it's saying that's enough for me."

"When I can't eat anymore—when it hurts to eat or it would make me sick."

"My stomach tells me to stop. My stomach tells me I'm done eating because it hurts, it gives me something to watch out for so I don't overeat."

"I can't eat no more."

"When something is hard in my stomach. I stop breathing a little bit."

"When my stomach is about to explode."

"When I throw up."

3.1.5. Food is gone

Another theme that emerged from this question was the response that an individual feels full when their food is gone. Four participants noted that they use the amount of food available rather than relying on internal signals as a sign of being full.

"When I'm finished with the meal."

"I don't know. Sometimes I just stop eating. I eat one plate and that's it."

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