

## **Qualitative Evidence of the Disconnect Between Intent and Interpretation of Common Child Obesity Prevention Messages**

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### **Abstract**

Health professionals disseminate obesity prevention messages regarding food selection, eating, and physical activity behaviors, based on varying levels of evidence. However, little is known about whether or not parents understand the connection between these messages and a child's weight. A pilot study was conducted to evaluate the understanding of selected child obesity

prevention messages by 44 low-income mothers of children aged 4-10 years. Mothers were asked to report perceptions of how each targeted behavior might prevent children from becoming obese. Six states used a single recruitment strategy, interview tool, and protocol using a card sort activity with projective interviewing techniques. Targeted behaviors included eating together as a family, limiting sedentary activities, restricting access to food, portion sizes, eating out, choosing healthful foods, sweetened beverage intake, and eating breakfast daily. Some flawed maternal interpretations emerged regarding perceived relationship of messages to weight status. Examples include family meals lead to overeating; playing video games keep children from snacking; and confusion regarding food restriction. Thus, health professionals need to evaluate messages to ensure they are being correctly interpreted by low-income mothers of young children.

Key words: feeding children, child obesity, prevention, family meals, mothers

## Background

Efforts to prevent childhood obesity need to address healthful behaviors both through direct messages promoting evidence-based practices and through strategies aimed at creating environmental conditions supporting these behaviors. Numerous public health agencies, programs and researchers promote a fairly consistent set of messages to help parents guide children's eating and physical activity choices (American Dietetic Association 2008; Davis et al. 2007; Gill, King, and Caterson 2005; Fiese and Schwartz 2008). Recommended practices are based on scientific understanding of factors that influence weight status and the effectiveness of these practices in preventing childhood obesity. These practices are supported to varying degrees by evidence from epidemiologic and intervention research, although definitive evidence may be lacking (Table 1). However, little is known about whether or not parents understand the connection between these messages and a child's weight (Institute of Medicine 2001). Such understanding is necessary to build confidence regarding one's adoption of a message. In determining the success of childhood obesity prevention efforts, it has been suggested that parental confidence is an important factor in being able to make appropriate behavioral changes (Traveras 2009).

Table 1. Level of evidence for predominant child obesity prevention messages

Targeted Behavior Messages	Evidence Grades <sup>a</sup>
Decrease intake of sweetened beverages**	II; probable
Watch portion sizes**	III; possible

Eat out less often; choose healthful foods when eating out	III; possible
Make wise snacking choices	III; NA
Eat breakfast everyday **	II; NA
Eat less foods with empty calories	II; convincing
Eat more fruits**, vegetables**, and whole grain (high fiber) foods	II; convincing for fiber
Tell children to eat all of the meal before getting dessert; allow children to eat all foods brought into the house (e.g. practice an authoritative parental feeding style)	III; possible
Spend less time with computer and video games; watch less TV and videos (Decrease sedentary behaviors) Eating together as a family	II No evidence grade available

[Table 1 Summary: Level of evidence for predominant child obesity prevention messages based on targeted behavior messages associated with childhood obesity with strength of evidence evaluated by the American Dietetic Association Evidence Analysis Library and other researchers.]

a Meaning of grades

I = good; II = fair; III = limited; IV = expert opinion only; V = grade not assignable. Pediatric weight management evidence-based nutrition practice guidelines. American Dietetic Association Evidence Analysis Library Web site. <http://www.adaevidencelibrary.com/topic.cfm?cat=2721>. Accessed November 23, 2008.

Convincing, probable, possible and not available (NA). [1]

\*\* Consistent frequency of evidence (no level grade given). Davis M, Gance-Cleveland B, Hassink S, Johnson R, Paradis G, Resnicow K: Recommendations for prevention of childhood obesity. *Pediatrics*. 2007;120:S229-S253.

Children of low-income families are often at high risk for becoming obese (Wang and Zhang 2006) and their families are an important target for prevention messages. Indeed, programs such as the Expanded Food and Nutrition Education Program (EFNEP), the Special Supplemental Program for Women, Infants and Children (WIC) and a variety of activities operating under the Supplemental Nutrition Assistance Program-Education (SNAP-ED) disseminate many child obesity prevention messages to low-income families. This pilot study was undertaken to determine if mothers had heard the messages and if they believed the behavior described in the message would prevent childhood obesity. This paper describes maternal rationale behind their responses.

## Methods

As part of a USDA-sanctioned multistate project (NIFA W1005), six states (Indiana, Michigan, Nebraska, Nevada, New York and Utah) collaborated to determine a single recruitment protocol, data collection tools, and interview procedures (including a script and coding forms). Collaborators reached consensus to use a convenience sample of English-speaking mothers recruited from Cooperative Extension and other community agencies providing nutrition education to low-income populations. Each state received approval from its respective Institutional Review Board. The goal was to interview at least five mothers (of children ages four to ten years old) in each state (for a minimum of 30 respondents) to achieve a geographically and ethnically/racially diverse sample.

## Messages

Using the merged list of selected nutrition messages shown in Table 1, the authors created laminated cards that contained words and pictures describing the intent of these messages. In order to capture the essence of food restriction (Faith et al. 2004) and authoritarian feeding style (Hughes et al. 2006), the following respective statements were used: 'Allow children to eat all foods brought into the home' and 'Tell children to eat all of the meal before getting dessert.' Messages were cognitively pretested with five representative mothers from Nevada.

## Interviews

After obtaining informed consent, mothers were interviewed by trained personnel. All interviews were recorded and later transcribed verbatim. A mixed-methods approach using projective interviewing and a card sort activity was employed. Projective techniques are qualitative strategies used in market research to uncover feelings and rationales that underlie consumer behavior (Day 1989). These techniques also reduce the barriers of rationalization and respondent bias to please the investigator by allowing subjects to project their feelings and perceptions onto others. Researchers opined that mothers might wish to please the interviewer. To address this

potential bias, mothers were asked if they thought others would find each messages easy or hard to implement, although this information is not presented in this paper. By asking what others might think or do, interviewed mothers could potentially reveal their personal beliefs, understanding, knowledge and practices and qualify their responses.

To reach the topic of the relationship of each message to children's weight, a three-step interview process was designed. This process allowed mothers to become comfortable discussing child nutrition with the interviewers. First, mothers were provided with a stack of cards listing nutrition messages plus two sorter cards entitled: familiar and not familiar. They were asked to separate the messages into these two groups. Step 2 required mothers to sort the entire stack again into two piles: others would find this message hard to follow or easy to follow. They then explained their decisions, a procedure that further served to relax mothers and get them comfortable talking (data not presented). During Step 3, mothers sorted the entire stack one last time into three piles: message is related to child's weight, not related to child's weight or unsure if related or not. After sorting, they were asked to expand upon their choices. After completing the card sort, mothers provided demographic information.

The card sort activity allowed for quantification of responses as well as qualitative exploration of the rationale behind responses. Probing for their understanding of the messages further confirmed their familiarity with each message. Advantages to using this method include engagement with the interviewee, interview brevity, and avoidance of low literacy issues (Yarooh 2002). Finally, thinking about other families depersonalizes the issue and may enable mothers to feel more comfortable talking about themselves and their own family.

### **Data Analysis**

Transcriptions from each state were merged, allowing qualitative analysis of the rationale underscoring responses. Three researchers (KSK, HS, MSG) independently reviewed the merged file for a more in-depth understanding of mothers' responses to the potential for each message to affect a child's weight. First, mothers' responses were sorted based on mothers being familiar or unfamiliar with a message. Those unfamiliar with a specific message were dropped from further analysis for that message only. Responses from Step 2 (regarding practice by self or by others) were not used for this paper. Familiar messages then were sorted into three major categories: (A) message is connected to a child's weight status; (B) message is not connected; or (C) unsure if connected or not. For each of these categories, responses were sorted further into correct or flawed rationale, using the ADA evidence-based library and supporting literature as validation. Flawed responses included those where mothers' reasoning was totally unsupported by the literature, mothers misconstrued the science, or mothers appeared to show understanding of the message but not the link of the message to a child's weight status. Some mothers did not provide a definitive rationale for a response to a particular message and were dropped from further

analysis for that message only. In cases where both flawed and correct rationales were given by the same mother for a single message, answers also were dropped.

Thus, the final qualitative analysis was conducted on responses of those mothers familiar with a message who provided either correct or flawed rationales to support their responses to the connection of the message to a child's weight status. Six categories of responses emerged: yes (message is connected with child's weight) with correct (A1) or flawed (A2) rationale; no (not connected) with correct (B3) or flawed (B4) rationale; or answer unsure with correct (C5) or flawed (C6) rationale. Three researchers independently sorted responses into these categories, with greater than 95 percent initial agreement. Investigators concurred about differences until total agreement was made.

## Results

### Description of Sample

Forty-four mothers (mean age: 32 years; range: 22-46 years) were interviewed: 11 each in Nebraska and Indiana; 5 each in Utah, Nevada and New York; and 7 in Michigan. Slightly fewer than half (44 percent) were employed full time or part time. Approximately one-third (35 percent) had a high school education or less. Of the 26 mothers providing ethnicity/racial information, 15 were African-American, 10 were white and one was Asian; 6 of those selecting white also responded 'yes' to being Hispanic. Due to the small sample size, none of these demographic characteristics were used in the qualitative analysis. Table 2 presents card sort responses regarding familiarity with messages and perception of connection to a child's weight. Categorization of rationale and excerpted quotes demonstrating rationale for those familiar with selected messages appear on Table 3.

Table 2. Responses of low-income mothers to card sort activity <sup>a</sup>

Message/Practice	Percent Familiar with Message (n)	Percent response to 'Will practice keep a child from becoming overweight (fat)?' (n)		
		Yes	No	Unsure
Decrease intake of sweetened beverages	100 (44)	93 (41)	2 (1)	5 (2)
Make wise snacking choices	100 (44)	96 (42)	0	5 (2)

Eat together as a family	100 (44)	55 (24)	16 (7)	30 (13)
Watch portion sizes	98 (43)	93 (40)	7 (3)	0
Eat out less often	98 (43)	86 (37)	5 (2)	9 (4)
Eat more fruits, vegetables and whole grain foods	98 (43)	93 (40)	2 (1)	5 (2)
Spend less time with computers and video games	95 (42)	84 (35)	5 (2)	11(5)
Watch less TV and videos	95 (42)	86 (36)	5 (2)	9 (4)
Eat breakfast everyday	93 (41)	77 (32)	7 (3)	16 (6)
Choose healthful foods when eating out	88 (39)	82 (32)	11 (4)	7 (3)
Tell children to eat all of the meal before getting dessert	75 (33)	43 (14)	41 (13)	16 (5)
Eat less foods with empty calories	72 (32)	82 (26)	5 (2)	14 (4)
Allow children to eat all foods brought into the home	51 (22)	30 (7)	27 (6)	43 (9)

[Table 2 Summary: Responses of low-income mothers to a card sort activity to illustrate the percent of mothers familiar with childhood obesity messages and their belief if the practices of the messages are associated with childhood obesity]

<sup>a</sup> Percentages may not add up to 100 due to rounding.

Table 3. Rationale provided by low-income mothers who reported they were familiar with an obesity prevention message and agreed that the message was connected to a child's weight\*

Message (n)	Examples of rationale correctly related to weight and evidence-based	Examples of flawed rationale (incorrectly related to weight,
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	Percent Correct (n)	incomplete or not evidence-based) Percent Flawed (n)
Decrease intake of sweetened beverages (25)	Empty calories. The less calories you get the less you have to burn. If the child was already drinking a lot of sweetened beverages then cutting back would help them lose weight. 'Cause [sic] sugar just turns into fat, eventually. So, a lot of sugar, they're gonna [sic] getting plump. 72 (18)	Well when you drink sweet juice and sugary juice, you want a snack with it. Make you dehydrated because they don't quench your thirst. 28 (7)
Make wise snacking choices (21)	If they eat good healthy snacks, it should keep 'em [sic] slim and trim, and if they stay active. 81 (17)	I've seen some families do that; go eat a bag of popcorn. That's not a snack, something more of a junk food. You've got all of that butter and all the salt. 19 (4)
Eat together as a family (16)	Family eating together is helpful. Kids can make positive associations with foods. You all get to see what everybody is eating and communicate and different things. ...because if you're trying to teach your children to eat certain foods which they're not used to, if they see you eating those foods with them they might try them. 56 (9)	Uh, when you eat together as a family the parent or guardian involved will see what the kids eat and they can monitor their eating, or they can decide. . . you think you've had enough, or make a decision. No, it can prevent other things, but not overweight. 44 (7)
Watch portion sizes (20)	Especially important in people who haven't been raised to listen to their turn off signal. ...well if they don't eat so much of their food, they won't, you know, gain so much weight. 85 (17)	It's a complicated answer, but if they eat bigger portions when they're younger, they stretch their stomachs and by the time they're adults they're over eating all the time.



		I don't think that makes a difference in portion sizes, I think it's the quality not the quantity 15 (3)
Eat out less often (24)	...[you] can make somethin' [sic] more healthy if you're makin' [sic] it yourself versus you don't know what the restaurants are puttin' [sic] in their food. 58 (14)	Whenever you want to gain weight eat out; whenever you want to start losing weight stop eating out...Not sure why. Eating out is where you get trans-fats 42 (10)
Eat more fruits, vegetables and whole grains (18)	...that's a very healthy way that prevents gaining too much weight...you would be more healthy than eating a lot of junk. 78 (14)	I'm a huge fan of eating clean and that is truly eating clean. A lot of excess stuff you do not need. It's just gonna [sic] be dead weight on you. . . . . .fruit, and like vitamin C, it helps flush out a lot. And then the vegetables. . . absorb fat in the stomach. 22 (4)
Spend less time with computers video games (22)	...the more they sit, they don't burn off any energy. So, if they go out and do some things, then they use more calories. 73 (16)	. . .if they're sitting playing they're probably gonna [sic] want a snack. . . .if [kids] are doin' [sic] somethin' [sic] it kinda [sic] would take their minds off food. 'Cause on the TV and videos they show food and I think they are less likely to want to eat. 27 (6)
Watch less TV and videos (36)	...if they are not watching TV they could be doing something that is active like playing outside or something. 83 (30)	They might tend to lay [down]. I heard if you lay down after you eat you gain weight 17 (6)

Eat breakfast every day (27)	You've been fasting for so many hours and your body wants to eat. If you eat breakfast you are less likely to snack, and eat less at lunch and dinner. 85 (23)	Breakfast every day, well I think this is like the most important meal for children to have. So I think it would definitely help their minds and bodies. I mean if they come to school with you know without eating breakfast and I think they get to the point where they're feeling hungry later or their body, they're not as energized and they don't focus in school and stuff 15 (4)
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[Table 3 Summary: Examples of correct or flawed (incorrectly related to weight, misconstrued or not evidence-based) rationale provided by low-income mothers who reported they were familiar with an obesity prevention message and agreed that the message was connected to a child's weight.]

\* If mothers provided both a correct and incorrect rationale, their responses were not included.

## Discussion

Child obesity prevention messages were familiar to those interviewed, with all but one of the 13 messages known to at least 70 percent of mothers. Similarly, most messages were thought to be related to a child's weight status. Taken at face value, these results indicate that low-income mothers in our survey were aware of most nutrition messages addressing their child's eating and physical activity choices. One could assume that nutrition educators have done an excellent job in disseminating messages. However, as the researchers delved deeper into maternal thought processes, another picture of the depth of mothers' understanding was revealed. Some mothers who said a message was not connected to a child's weight status, actually supplied rationales that supported understanding. On the other hand, some mothers who said a message was connected to weight status, provided reasons that had nothing to do with weight. Three messages familiar to all mothers were decreasing intakes of sweetened beverages, making wise snacking choices, and eating together as a family. However, when those familiar with these messages indicated that the message was related to a child's weight, 28 percent, 19 percent and 44 percent respectively provided flawed rationale for the relationship (Table 3).

Perhaps the most interesting responses dealt with family meals. Less than half of mothers thought that eating together as a family could impact a child's weight, contrary to recent evidence suggesting that family meals can influence children's weight (Neumark-Sztainer et al. 2010; Gable, Chang and Krull 2007). Some thought that eating together was a good idea, but for reasons other than those related to weight. One mother expressed a child "won't be socialized better" if families did not eat together. A few thought a child might actually overeat when eating with the family or that a child might limit intake due to not liking to be watched when eating. Some who thought there was a connection between eating meals together and a child's weight actually provided rationale indicative of an authoritarian parenting feeding style (Hughes et al. 2007; Faith et al. 2004; Fisher and Birch 1999), which current research suggests is counterproductive to obesity prevention. For example, controlling a child's food intake during family mealtimes by withholding dessert until the child ate all other foods was mentioned by several mothers. It is unknown what the underlying thoughts for maternal rationale were, but the expressed confusion suggests nutrition educators need to provide clear explanations regarding benefits of family meals as a strategy to preventing child obesity.

Even more striking were responses to the two questions about sedentary behavior (spending less time with computers and video games, and watching less TV and videos). Childhood obesity has been linked to time spent watching television (O'Loughlin et al. 2000) and in another study, weight was positively associated with the use of video games and television viewing time in both boys and girls (Berkey et al. 2000). Although significant negative associations between physical activity and BMI have been found (Delany et al. 2004; Moore et al. 2003), several mothers in our study saw a positive effect of playing videos games (e.g. a child could not eat when playing them; some games are educational). The following quotes sum up why: "when the kids are quiet, you give in to the moment so you can get things done", and "they want their kids busy doin' something...like a baby sitter." Another expressed that "kids nowadays are not very outdoorsy..." These responses actually may reflect low maternal confidence in their ability to decrease viewing habits (Taveras 2009).

The concept, 'allowing children to eat all foods brought into the home,' received the lowest familiarity rating and highest skepticism to prevention of obesity. This concept relates to restriction (Faith and Kerns 2005; Faith et al. 2004), i.e. stopping children from eating certain foods brought into the house. Restricting children's access to foods already in the home has been repeatedly linked to a higher risk of childhood obesity (Faith et al. 2004; Fisher and Birch 1999; Ogden, Reynolds and Smith 2006; Francis, Hofer and Birch 2001). During the analysis, authors noted dichotomous thoughts regarding parenting around food: strict parental control of a child's access to foods in the home (an authoritarian feeding style) as opposed to having no limits/boundaries to foods once they enter the home (permissive feeding style) (Hughes et al. 2006). Parents appear confused about the difference between not bringing food into the home

(covert restriction) as compared to the overt restriction of denying the food once it is in the home (Ogden, Reynolds and Smith 2006).

Although this is a small pilot study which prevents generalizability, it does include a diverse group of low-income mothers from multiple geographical areas. Furthermore, the projective technique of placing oneself in another's situation appeared to overcome the limitation related to socially desirable responses (Day 1989). Mothers were comfortable providing their opinions. Some interviews were close to 60 minutes long. Mothers may have reflected their own lives and practices when talking about others which in turn may have allowed them to reveal their depth (or lack) of understanding regarding the messages and a child's weight.

### **Conclusion**

Many common nutrition messages are reaching these low-income mothers. However, mothers did not always understand the relationship of these messages to a child's weight. Furthermore, although most messages were familiar to those interviewed, there was confusion regarding the meaning of some messages to some mothers. The eating environments for young children, as well as opportunities for being physically active, are largely influenced by their main caregiver. This lack of understanding of common obesity prevention messages suggests a breakdown in the connection of research informing practice (Gable, Change and Krull 2007; Strolla, L., K.Gans, and P. Risica 2006). As an important step to adoption of potentially effective messages, nutrition educators need to clearly show the connection of concepts and messages to the prevention of child obesity.

### **Application**

It appears that maternal familiarity with recommended practices to prevent childhood obesity is not a problem, but rather the interpretation of these messages may be incorrect. If messages themselves do not connect the concept with prevention of child obesity, mothers may not intuitively be able to make the link. Some nutrition concepts are difficult to explain (such as those related to restriction and feeding); others appear simple (e.g. decreasing intake of a food item) but have been convoluted in the mother's mind (e.g. relating decreasing sweetened beverages to fats rather than sugars). It is essential that nutrition educators, dietitians and other health professionals devote the necessary time and effort when developing messages by first determining cognitive understanding of what they are trying to communicate. This will help ensure that messages are conveyed in consumer-meaningful ways. Messages may need to include how to address any reluctance to be firm and consistent in parenting behaviors around food and activity rather than focus solely on foods or components of foods. Finally, projective techniques may be useful in dealing with social desirability bias in both research and nutrition education. As recommended by the American Academy of Pediatrics (Barlow 2007) and

confirmed in this study, use of qualitative approaches (such as projective methods and card sorts) (O'Loughlin et al. 2000) when assessing dietary practices and knowledge might be helpful in uncovering disconnect and confusion between messages and health issues (Schunk, McArthur and Maahs-Fladung 2009; Dammann and Smith 2009).

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