

# BMJ Open

## When Does Obesity Become a Problem? A Qualitative Analysis of Parents' and Grandparents' Perceptions of Preschoolers' Body Weights

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2014-006609
Article Type:	Research
Date Submitted by the Author:	12-Sep-2014
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<b>Primary Subject Heading</b>:	Public health
Secondary Subject Heading:	Qualitative research
Keywords:	PAEDIATRICS, Community child health < PAEDIATRICS, PRIMARY CARE, PUBLIC HEALTH

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3 **When Does Obesity Become a Problem? A Qualitative Analysis of Parents' and**  
4 **Grandparents' Perceptions of Preschoolers' Body Weights**  
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## Abstract

**OBJECTIVES:** Parents' difficulties in perceiving children's weight status accurately pose a barrier for family-based obesity interventions; however, the factors underlying weight misinterpretation still need to be identified. This study's objective was to examine mothers', fathers', and grandparents' perceptions of preschoolers' body sizes. Interview questions emphasized perceptions of overweight and obesity from a life course perspective, parental responsibility, and appropriate contexts in which to discuss preschoolers' weights.

**DESIGN:** Semi-structured interviews, which were videotaped, transcribed, and analyzed qualitatively.

**SETTING:** Eugene and the Springfield metropolitan area, Oregon, USA

**PARTICIPANTS:** Families of children aged 3-5 years were recruited in February – May 2011 through advertisements about the study, published in the job seekers' sections of Craigslist and local newspapers. 49 participants (22 parents and 27 grandparents, 70% women, 60% with overweight/obesity) from sixteen low-income families of children aged 3-5 years (50% girls, 56% with overweight/obesity) were interviewed.

**RESULTS:** There are important gaps between clinical and lay perceptions of childhood obesity. While parents and grandparents were aware of their preschoolers' growth chart percentiles, these measures did not translate into recognition of children's overweight or obesity. The participants spoke of obesity as a problem that may affect the children in the future, but not at present. Participants identified childhood obesity as being transmitted from one generation to the next, and stigmatized it as resulting from 'lazy' parenting. Parents and grandparents avoided discussing the children's weights with each other and with the children themselves.

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3 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with  
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5 parents and grandparents about the meaning and appearance of obesity in early childhood, as  
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7 well as counteract the social stigma attached to obesity, in order to improve the effectiveness  
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9 of family-based interventions to manage obesity in early childhood.  
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For peer review only

### Strengths and limitations of this study

- This study's sample is the largest ever reported in a qualitative investigation of family members' perceptions of preschoolers' body weights.
- While most previous studies focused only on mothers' perceptions of their preschoolers' body weights, this study included mothers, fathers, grandmothers, and grandfathers, recognizing that various adult family members influence young children's body image, eating, and exercise habits.
- Although low-income participants tend to be difficult to reach, the study successfully recruited a predominantly low-income sample.
- The sample primarily consisted of families of Caucasian origin, and thus did not allow for an investigation of the influence of cultural background on perceptions of children's body sizes.
- As several participants were single mothers, the number of fathers was not high enough to enable an assessment of potential differences between fathers' and mothers' perceptions.

## INTRODUCTION

While there is growing evidence of the superior effectiveness of lifestyle interventions initiated early in childhood<sup>1-3</sup>, one of the main barriers in conducting such interventions is parents' lack of recognition of, or concern about, obesity in children. Parents' difficulties in perceiving children's body sizes accurately have been demonstrated since the early 2000s, across many countries, cultures and child ages<sup>4-6</sup>. A recent study of over 16,000 children aged 2-9 years from eight European countries has shown that, among parents of overweight children, 63% perceived their children's weights as 'proper', independent of educational level<sup>7</sup>. Moreover, a meta-analysis of 69 studies on parental perceptions of children's body weights showed that half of the parents underestimated their children's weights.<sup>8</sup>

Most studies have applied a quantitative approach to describe parents' miscategorization of children's weight status; however, the underlying factors have not been identified conclusively<sup>6</sup>. To date, only two studies<sup>9 10</sup> have used in-depth interviews to examine how parents make sense of children's body weights and their health implications. In their study of low income mothers, Jain et al have shown that most mothers did not worry about their children's body weights if the children were active and socially accepted; the mothers, however, distrusted pediatric growth charts<sup>9</sup>. Misinterpretation of growth charts was also highlighted by Rich et al, who found that 80% of parents perceived their child as healthy although the child's weight was at the 95<sup>th</sup> percentile. These parents, notably, were aware of obesity related health risks<sup>10</sup>. More recently, focus groups revealed that, in assessing their children's body sizes, parents tend not to rely on clinical measurements; rather, they often compare their children visually to other children whose body sizes can be defined as extreme, thus skewing their perceptions of what a healthy body size is<sup>11</sup>.

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5 So far, existing research on parental perceptions of children's body weights has focused  
6 almost exclusively on mothers, not acknowledging the critical influence of other family  
7 members, such as fathers and grandparents<sup>12</sup>. Because family-based interventions have been  
8 proposed as the most effective approach to treating child obesity<sup>13 14</sup>, knowledge about how  
9 other adult caretakers perceive and discuss young children's body weights will contribute to  
10 understanding familial barriers to treatment. To examine caretakers' perceptions of young  
11 children's body weights from a broader familial perspective, we designed this study to include  
12 family sets of mothers, fathers, and grandparents actively involved in taking care of preschool  
13 age children. As childhood obesity remains high among families with low socioeconomic  
14 status<sup>15-17</sup>, and as it is more difficult to recruit and retain these families in intervention  
15 programs<sup>18 19</sup>, we chose to target a low income population.  
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## 31 **METHODS**

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33 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield  
34 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements  
35 about the study, published in the job seekers' sections of Craigslist and local newspapers. The  
36 study's main research aim was to evaluate the role of grandparents in the development of  
37 preschoolers' lifestyles early in life, such that the active involvement of grandparents in  
38 family life (defined as spending time with the grandchild at least twice a month) was the  
39 primary criterion for inclusion in the study. Consequently, only families in which at least one  
40 parent and one grandparent were willing to be interviewed were included in the study. The  
41 other inclusion criteria specified that the child's age must be between 3-5 years, and that the  
42 child should have no underlying medical condition or disability which would affect his/her  
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3 weight. The study was approved by the Internal Review Board of the Oregon Social Learning  
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5 Center.  
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10 In total, 49 family members (70% female) from sixteen families were interviewed.

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12 Participants' characteristics are summarized in Table 1. Due to the targeted recruitment  
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14 process (ads in job advertisement sections) the sample displayed low levels of education and  
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16 income; as many as 50% of parents were unemployed. Moreover, more than half of parents  
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18 and two thirds of grandparents had overweight or obesity, according to WHO criteria<sup>20</sup>. Of the  
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20 children, 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile  $\leq$  BMI < 95th  
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22 percentile; obesity: BMI  $\geq$  95th percentile)<sup>21-23</sup>; those five who were categorized as obese  
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24 were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI. The majority of  
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26 children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this  
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28 region of the Pacific Northwest.  
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34 *Insert Table 1 here.*  
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39 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.  
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41 Free child care was provided on site, and the children were not present during the interviews.  
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43 Each interviewed participant received compensation of \$50 for participating in the study.  
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45 Prior to the interview, parents and grandparents completed a comprehensive  
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47 sociodemographic questionnaire. All the interviewed parents and grandparents as well as the  
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49 preschooler in focus had their height and weight measured, without shoes and wearing only  
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51 light clothing, by trained research staff prior to the interviews. The interviews, which were  
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53 conducted by a single researcher (either the second or the last author), lasted 1.5-2.5 hours  
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3 and explored the different roles of family members in shaping a child's lifestyle. Before  
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5 coding, all participant names were changed to ensure confidentiality.  
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10 This paper focuses on the parents' and grandparents' perceptions of young children's body  
11 weights, with particular emphasis on overweight and obesity from a life course perspective,  
12 parental responsibility, and contexts in which parents and grandparents discuss preschoolers'  
13 body weights. The main questions were: (1) Do you think that how much a child weighs  
14 matters? If yes, why? If not, why? (2) How much do you think that a child's weight is  
15 possible to control/controllable? If yes, what lifestyle choices do you think are the most  
16 important? How/when do you think they can be promoted, and who do you think can do that?  
17 And who in the family plays the most important role when it comes to influencing the child's  
18 weight? If no, what makes you think that way? (3) What do you think about your child's (or  
19 grandchild's) weight? As compared to his/her siblings, cousins, other children, to the child's  
20 parents. Are you concerned/not concerned? (4) What do you think that the parents of your  
21 grandchild think about your grandchild's weight (or grandparents of your child about your  
22 child's weight)? Examine: If there are two parents (grandparents) in the house, do they have  
23 the same opinion? (5) Do you talk about your child (grandchild's) weight with his/her  
24 grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two parents in  
25 the house, which of them do you talk the most with and why? (6) Do you know if your child  
26 (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it? Did that  
27 happen in your presence? If yes, what did you say? If your child doesn't think about his/her  
28 weight, is it good or bad?  
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54 It should be noted that while all participants were asked the same main questions, the  
55 interview process allowed for fluidity, and follow-up questions were adapted according to  
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3 each participant's responses. Additionally, while the majority of data directly refer to the main  
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5 questions listed, the present analysis includes pertinent comments the participants made  
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7 throughout the interviews. The interviews were videotaped and transcribed in full. For this  
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9 paper, transcript sections that related to the main questions were extracted and collated. The  
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11 transcripts were then coded independently by the first and the last author, using a thematic  
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13 discourse analysis approach. Discourse analysis is concerned with people's use of language to  
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15 describe and make sense of their realities, and is an appropriate approach for qualitative  
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17 studies that examine people's definitions of and spoken attitudes towards health issues<sup>24</sup>. Over  
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19 several in-person meetings and email correspondence, the two coders compared and discussed  
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21 their codes, to examine and resolve potential disagreements, and reach consensus on the  
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23 clustering of codes into themes and on the grouping of themes under thematic categories.  
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## 29 **RESULTS**

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34 The analysis yielded twelve major themes, clustered under four thematic categories:  
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36 Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions  
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38 of parental responsibility and blame for childhood obesity, and perceptions of appropriate  
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40 contexts for speaking about preschoolers' body weights. Examples of participant quotes from  
41  
42 each of the thematic categories and their constituent themes are presented in table format  
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44 (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental  
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46 material.  
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52 *Insert Tables 2-5 here.*  
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### Perceptions of young children's body sizes (Table 2)

None of the participants used the words 'obese' or 'overweight' to describe the preschoolers whom the growth charts defined as such. The participants used a range of words to describe the body sizes of these preschoolers, including 'pudgy', 'chunky', 'solid', 'stout', 'chubby', 'stocky', 'big boned', and 'robust'. Several participants described the preschoolers as 'tall' and/or 'big for their age'. Notably, even the father of the heaviest child in the sample (99<sup>th</sup> percentile) described his child as 'a little on the heavy side'. Across the sample, including the parents and grandparents of normal weight children, the participants spoke of 'baby fat' as cute and healthy, and even as something to encourage. A few participants also spoke of children's higher percentiles on the growth charts (>90<sup>th</sup> percentile) in positive terms. The parents and grandparents of the overweight or obese preschoolers said their body weight was not worrisome because children go through 'growth spurts' and 'stretch out', such that their current excess weight will eventually convert into height.

### Perceptions of the timeline of obesity (Table 3)

The participants spoke of obesity as a problem that may affect the preschoolers in the future, but not at present. Several participants indicated that a high body weight becomes problematic when the child reaches school age, particularly due to the risk of teasing, social exclusion, and bullying. Participants also said that a high body weight becomes problematic when it negatively affects the child's health, activities, behaviors, or mood. However, only one participant, whose child was in the 99<sup>th</sup> percentile for weight, said that she could notice the detrimental effects of the child's body weight at present. Thus, even when speaking of obesity in terms of impact on activity and health, the participants placed it outside the remit of the preschoolers' current experience. Participants also spoke of obesity as problematic due to its manifestations in adulthood, expressing that children's body weights and their eating and

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3 exercise habits are important because they translate into ‘long lasting effects’ and ‘hav[ing]  
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5 more trouble as an adult’.  
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#### 9 10 **Perceptions of parental responsibility and blame for childhood obesity (Table 4)**

11 The participants identified parents as bearing primary responsibility for their children’s eating  
12 and exercise habits and for their body weights. Even those participants who spoke of body  
13 size as being affected by genetics asserted that parents can still influence their children’s body  
14 weights. Likewise, participants who mentioned that children may be overweight or obese due  
15 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making  
16 sure the child’s medical problem is identified and resolved. The participants argued that  
17 parents are responsible for children’s body weights because they can control what their  
18 children eat, provide a healthy food environment at home, encourage their children to play  
19 outside and be active, and model healthy behaviors themselves.  
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32 The participants’ concepts of parental responsibility linked with their attitudes towards  
33 parental blame for childhood obesity. Several participants said they ‘judged’ parents whose  
34 children were obese; some even said that the parents of obese children were guilty of child  
35 neglect or abuse. Participants identified childhood obesity as being transmitted from one  
36 generation to the next, and as the result of ‘lazy’ parenting. Having an obese child was an  
37 outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling  
38 blamed by clinicians for the child’s unexplained weight gain.  
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## Perceptions of appropriate contexts for speaking about preschoolers' body weights

### (Table 5)

The participants described discussions of preschoolers' body weights as sensitive, often unnecessary, and potentially dangerous. The decision to engage in discussion about children's body weights was context dependent. Participants said they discussed their children's or grandchildren's body weights with them only if the children themselves raised the topic. Those participants whose preschoolers did not mention body weight said they had never discussed the issue with them. Several participants said that children of preschool age do not have body image concepts related to weight, and some cited their preschoolers' 'comfortable' behaviors as signaling a lack of concern with body image. A number of participants also said they avoided discussions of their preschoolers' body weights because these discussions could be harmful to the children's self-esteem and emotional wellbeing.

Notably, parents avoided discussing their children's body weights not only with the children themselves, but also with the children's grandparents; likewise, grandparents avoided discussing their grandchildren's body weights with the parents. Participants described these discussions as unnecessary when body weight was 'not an issue'. It was only when a child's body weight was perceived as problematic (in the case of the largest child in the sample) that parents and grandparents said they openly discussed it with each other. However, while most participants said they did not discuss body weights, they identified comments on children's 'healthy' appearance, growth, or muscle definition as appropriate and positive. Thus, although participants were reluctant to discuss the preschoolers' body weights, they did discuss the preschoolers' body sizes, with attention to how 'big' or 'strong' they were.

## DISCUSSION

This study's findings suggest that the parents and grandparents of preschool age children face difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous research has found that low income mothers are not concerned about preschoolers' overweight because they attribute body weight to genetic heredity<sup>9</sup>. However, in this study, the participants strongly endorsed the idea that parents bear primary responsibility for their children's eating and exercise habits and body weights. Nevertheless, the participants did not speak of their own children or grandchildren as overweight or obese. Notably, the participants' responses were consistent across the sample, and no generational differences were observed between the parents' and the grandparents' perceptions of their preschoolers' body sizes.

Although the participants recognized obesity in general as a problem, they normalized their own children's and grandchildren's excess body weight as 'toddler pudge' or 'cute baby fat'. Like Jain et al<sup>9</sup>, the authors of the present study suggest that the participants used these words not as euphemisms. The participants' consistent descriptions of children's higher body weights in positive terms – as 'cute' or 'healthy' – underscore the invisibility of preschoolers' obesity among lay persons. While participants said that preschoolers' body weights would be problematic if the child became 'visibly overweight', it was unclear how a 'visibly overweight' preschooler might look. As noted by Jones et al<sup>11</sup>, when participants described obesity, it was through extreme cases of morbid obesity in later childhood or adulthood, such as older children who were 'miniatures of their parents' and contestants on *The Biggest Loser* who weighed 400 lbs.

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3 Just as the participants visualized obesity through images of older children or adults, they also  
4 spoke of obesity as a problem that might affect children later in life, but not in preschool age.  
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7 Participants spoke of suffering from teasing as a school age child, or from poor health as an  
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10 adult, as the consequences that marked obesity as a problem. While participants did say that  
11 they would recognize a body weight problem if their preschoolers showed negative changes in  
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13 behavior, activity, and mood, they did not name immediate health risks. The participants'  
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15 depictions of obesity revealed a disconnect between knowledge and perception, previously  
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17 shown by Rich et al<sup>10</sup>. Although they were aware of their preschoolers' growth chart  
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19 percentiles, most participants did not link these percentiles with the categories of 'overweight'  
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21 and 'obesity'. Likewise, although participants were aware of the health risks associated with  
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23 obesity, they did not link their preschoolers' body weights with potential problems in the  
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25 present tense.  
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32 While the participants did not associate obesity with early childhood, they did take  
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34 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise  
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36 practices. Along similar lines, however, the participants – including some whose children  
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38 were classified as obese –blamed parents for childhood obesity. The participants' expressions  
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40 of judgment toward the parents of obese children were aligned with broader social stigma  
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42 attached to obesity<sup>25 26</sup>. Given the participants' stigmatizing attitudes, it is not surprising that  
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44 they did not discuss their preschoolers' body weights with other family members. Although  
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46 parents and grandparents did discuss children's body sizes through comments on how 'big',  
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48 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were  
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50 classified as overweight or obese did not discuss their body weights with family members,  
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52 except when there was a perceived health problem. It is possible that, for the participants,  
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54 discussion of body weight threatened to expose both themselves and their children to the risk  
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3 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is  
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5 important to note that, in deciding not to discuss body weight with their preschoolers (unless  
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7 the children themselves raised the topic), the participants protected the children's body image  
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9 and self-esteem. Moreover, like the parents described by Andreassen et al <sup>27</sup>, those parents  
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11 who recognized their children needed to lose weight attempted to enact weight loss strategies  
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13 without explicitly mentioning weight. As previous studies have shown, parental comments  
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15 about body weight are associated with body dissatisfaction and reduced self-esteem in  
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17 children<sup>28-30</sup>, such that the participants' stance on avoiding 'weight talk' with children was  
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19 positive and should be encouraged.  
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25 The results of this study suggest that there are important gaps between clinical and lay  
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27 perceptions of childhood obesity. While parents and grandparents are aware of their  
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29 preschoolers' growth chart percentiles, these measures do not translate into recognition of  
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31 young children's overweight or obesity. Without visual examples of how a preschool age  
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33 child with overweight or obesity might look, such as sketched silhouettes or photographs at  
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35 different weight categories<sup>31-33</sup>, parents and grandparents continue to speak of children's  
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37 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later  
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39 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss  
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41 young children's body weights with the children and with one another, this might affect the  
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43 success of clinical interventions for childhood obesity, in which children's caretakers are  
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45 forced into a new and uncomfortable discussion.  
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51 The clinical implications of this study include several components. In discussions with parents  
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53 and grandparents of preschool age children, clinicians should clarify how children's fat  
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55 distribution and body sizes typically change with age. Clinicians should also speak with  
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3 children's caretakers about the meaning of growth chart percentiles, and provide visual  
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5 examples of how children might look in each of the percentile categories. Moreover,  
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7 clinicians should emphasize the immediate problems associated with obesity in early  
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9 childhood, such as hypertension (present at more than 50% of children with obesity),  
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11 dyslipidemia, motor skill development and orthopedic complications<sup>34-36</sup>.  
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16 The results also suggest that the countering of stigma should be an important part of the  
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18 clinical management of childhood obesity. Given the social stigma and blame attached to  
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20 parents of children with obesity, parents might contest a child's obesity diagnosis and be  
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22 reluctant to take part in interventions to manage their child's condition<sup>37</sup>. It is therefore crucial  
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24 that clinicians directly address stigma when they speak to parents, emphasizing that childhood  
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26 obesity is not the parents' fault, and that managing this condition together is a positive step.  
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28 Similarly, clinicians should avoid addressing parents of children with obesity in ways that  
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30 might make them feel guilty or judged. Finally, it is important that clinicians frame  
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32 discussions of children's body weights sensitively, and encourage parents and grandparents to  
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34 address children's eating and physical activity practices through positive words and actions,  
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36 without emphasizing body weight to the children themselves.  
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43 This study had some limitations. While the sample was the largest ever reported in a  
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45 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning  
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47 preschoolers' body weights, the children themselves were not interviewed. Moreover, the  
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49 sample primarily consisted of families of Caucasian origin, representing the ethnic  
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51 distribution of the population in Eugene and Springfield, Oregon. Thus, the influence of  
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53 cultural background on perceptions of children's body sizes, which several studies have  
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55 identified as important<sup>5 16 26</sup>, could not be investigated. Additionally, as several participants  
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3 were single mothers, the number of fathers was not high enough to enable an assessment of  
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5 differences between fathers' and mothers' perceptions and attitudes. Finally, while a number  
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7 of families had a full or nearly-full set of grandparents participating, some had only one or  
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9 two grandparents participating, due to circumstances such as the other grandparents' living  
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11 outside the area.  
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## 13 14 15 16 **CONCLUSION** 17

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20 This study was the first to focus on both parents' and grandparents' perceptions of  
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22 preschoolers' body weights, and is the largest qualitative study to date to include a mixed  
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24 familial sample of adult caretakers of preschool age children. The study's results demonstrate  
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26 that while parents and grandparents recognize childhood obesity as problematic, endorse  
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28 healthy eating and exercise habits, and take responsibility for children's body weights, they  
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30 find it difficult to recognize and discuss young children's overweight and obesity. The results  
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32 suggest that clinicians should clearly communicate with parents and grandparents about the  
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34 meaning and appearance of obesity in early childhood, as well as counteract the social stigma  
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36 attached to obesity, in order to improve the effectiveness of family-based interventions to  
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38 manage obesity in early childhood.  
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## 45 **ACKNOWLEDGMENTS** 46

47 We thank all the participating families and Eliah Prichard, Jessica Farmer, Kelly Underwood,  
48  
49 Bryn Shepherd and Waihan Leung, the students from the University of Oregon who  
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51 transcribed the interviews.  
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## CONTRIBUTORSHIP STATEMENT

Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote the manuscript, and approved the final manuscript as submitted.

Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the manuscript, and approved the final manuscript as submitted.

Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed the manuscript and approved the final manuscript as submitted.

Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and supervised data collection and analysis, coded the interviews and analyzed them together with Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.

## COMPETING INTERESTS

We have read and understood BMJ policy on declaration of interests and declare that we have no competing interests.

## FUNDING

This work was supported by grants to PN from the Sweden-America Foundation, the Oregon Social Learning Center and the Marie Curie VINNMER International Qualification (2011-03443).

## DATA SHARING

Online supplementary table S6-9 containing complete sets of pertinent participant quotes. No additional data available.

**REFERENCES**

1. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al. Interventions for preventing obesity in children. *Cochrane Database Syst Rev* 2011;12:CD001871.
2. Reinehr T, Kleber M, Lass N, Toschke AM. Body mass index patterns over 5 y in obese children motivated to participate in a 1-y lifestyle intervention: age as a predictor of long-term success. *Am J Clin Nutr* 2010;91(5):1165-71.
3. Danielsson P, Svensson V, Kowalski J, Nyberg G, Ekblom O, Marcus C. Importance of age for 3-year continuous behavioral obesity treatment success and dropout rate. *Obes Facts* 2012;5(1):34-44.
4. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight status of children: a metasynthesis of the current research. *J Am Acad Nurse Pract* 2009;21(3):160-6.
5. Parry LL, Netuveli G, Parry J, Saxena S. A systematic review of parental perception of overweight status in children. *J Ambul Care Manage* 2008;31(3):253-68.
6. Towns N, D'Auria J. Parental perceptions of their child's overweight: an integrative review of the literature. *J Pediatr Nurs* 2009;24(2):115-30.
7. Regber S, Novak M, Eiben G, Bammann K, De Henauw S, Fernandez-Alvira JM, et al. Parental perceptions of and concerns about child's body weight in eight European countries--the IDEFICS study. *Pediatr Obes* 2013;8(2):118-29.
8. Lundahl A, Kidwell KM, Nelson TD. Parental underestimates of child weight: a meta-analysis. *Pediatrics* 2014;133(3):e689-703.

- 1  
2  
3 9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't  
4  
5 low-income mothers worry about their preschoolers being overweight? *Pediatrics*  
6  
7 2001;107(5):1138-46.  
8
- 9  
10 10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions  
11  
12 of health status and play activities in parents of overweight Hispanic toddlers and  
13  
14 preschoolers. *Fam Community Health* 2005;28(2):130-41.  
15
- 16  
17 11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ.  
18  
19 Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int*  
20  
21 *J Obes (Lond)* 2011;35(7):953-62.  
22
- 23  
24 12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding  
25  
26 healthy behaviours for preventing overweight and obesity in young children: a  
27  
28 systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).  
29
- 30  
31 13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al.  
32  
33 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
34  
35 2009(1):CD001872.  
36
- 37  
38 14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of  
39  
40 Nutrition and Dietetics: interventions for the prevention and treatment of pediatric  
41  
42 overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.  
43
- 44  
45 15. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic  
46  
47 gradients in body weight of German children reverse direction between the ages of 2  
48  
49 and 6 years. *J Nutr* 2003;133(3):789-96.  
50
- 51  
52 16. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of  
53  
54 obesity among young U.S. children living in low-income families, 2008-2011.  
55  
56 *Pediatrics* 2013;132(6):1006-13.  
57  
58  
59  
60

- 1  
2  
3 17. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ.  
4  
5 Development of socioeconomic inequalities in obesity among Dutch pre-school and  
6  
7 school-aged children *Obesity (Silver Spring)* 2014;In press  
8  
9  
10 18. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E.  
11  
12 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
13  
14 2003(3):CD001872.  
15  
16 19. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al.  
17  
18 Strategies for Recruitment and Retention of Families from Low-Income, Ethnic  
19  
20 Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child  
21  
22 Weight. *Child Health Care* 2013;42(3):198-213.  
23  
24  
25 20. Report of a WHO consultation. Obesity: preventing and managing the global  
26  
27 epidemic. . *World Health Organ Tech Rep Ser*, 2000:1-253.  
28  
29  
30 21. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al.  
31  
32 CDC growth charts: United States. *Adv Data* 2000(314):1-27.  
33  
34 22. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al.  
35  
36 2000 CDC Growth Charts for the United States: methods and development. *Vital*  
37  
38 *Health Stat* 11 2002(246):1-190.  
39  
40  
41 23. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of  
42  
43 child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.  
44  
45  
46 24. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology,  
47  
48 discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.  
49  
50  
51 25. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol*  
52  
53 *Bull* 2007;133(4):557-80.  
54  
55  
56 26. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver*  
57  
58 *Spring)* 2009;17(5):941-64.  
59  
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27. Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and strategies when helping their overweight children lose weight. *Qual Health Res* 2013;23(10):1333-43.
28. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
29. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old girls. *Pediatrics* 2001;107(1):46-53.
30. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family weight talk and dieting: how much do they matter for body dissatisfaction and disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.
31. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents' perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.
32. Warschburger P, Kroller K. Maternal perception of weight status and health risks associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.
33. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about their child's weight: distinguishing facts from values. *Child Care Health Dev* 2013;39(5):722-7.
34. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al. Changes in lipidemia during chronic care treatment of childhood obesity. *Child Obes* 2012;8(6):533-41.
35. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb musculoskeletal health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.
36. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et al. Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr* 2008;152(4):489-93.

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37. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J Public Health* 2010;100(6):1019-28.

For peer review only



Table 1. Descriptive statistics of the sample

	Child (n=16)	Parent (n=22)	Grandparent (n=27)
Age (mean in years, range)	4.6 (3.1-5.7)	32.2 (22.7-49.5)	56.9 (43.0-77.9)
Gender:			
Female	8 (50%)	14 (64%)	21 (78%)
Male	8 (50%)	8 (36%)	6 (22%)
Racial background:			
Euro-American/Caucasian	11 (68%)	21 (95%)	23 (84%)
Native American	0	1 (5%)	0
Asian	0	0	1 (4%)
African-American	0	0	1 (4%)
Mixed	5 (32%)	0	2 (8%)
BMI (mean, range)	17.7 (14.3-21.5)	26.8 (16.1-39.1)	29.1 (16.1-49.4)
Weight status:			
Underweight	0	2 (9%)	1 (3%)
Normalweight	7 (44%)	8 (36%)	8 (30%)
Overweight	4 (25%)	6 (27%)	10 (37%)
Obese	5 (31%)	6 (27%)	8 (30%)
Highest school grade completed	n/a		
High school		8 (82%)	20 (74%)
College/University		4 (18%)	7 (26%)
Working situation	n/a		
Full time		7 (32%)	8 (30%)
Part time		4 (18%)	4 (15%)

Not employed*		11 (50%)	15 (55%)
Annual household income	n/a		
Less than 14,999 USD		8 (36%)	7 (26%)
15,000-24,999 USD		6 (27%)	6 (22 %)
25,000 – 39,999 USD		4 (18%)	6 (22 %)
More than 40, 000 USD		4 (18%)	8 (30 %)

\* Main reasons for unemployment among parents were child care, education and not finding work; among grandparents, unemployment was due to not finding work, going on retirement, or retiring due to personal health issues.

Table 2. Perceptions of young children's body sizes. Examples of participant quotes from each of the thematic categories and their constituent themes. The complete sets of pertinent participant quotes are provided as supplemental material.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

<b><i>Theme 1: Young children are 'pudgy' or 'big for their age', but not obese</i></b>
1.1 Gp03P2 (Father) ***: Yeah, I think personally, my son is a little on the heavy side. (...)But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.
1.3 Gp11G1 (Mother's mother) ***: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.
1.6 Gp01P1 (Father) ***: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.
1.8 Gp01P1 (Mother) ***: she's also getting really tall, but I have a concern that she's getting a little pudgier (...) She's pudgy, she is a little overweight and we're working on it.
1.14 Gp11G1 (Mother's mother) ***: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never been concerned about her weight.
1.16 Gp11P1 (Mother) ***: she has always been at the 90 or 100 percentile with her age group but in weight and always under in height. She has always been kind of short and stocky.
<b><i>Theme 2: 'Baby fat' is cute and healthy</i></b>
2.2 Gp05P2 (Father) *: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.
2.10 Gp11P1 (Mother) ***: Well we kind of joke about it because my daughter's kind of got the little girl gut.
2.11 Gp01G1 (Mother's mother) ***: she does have cute little love handles.
2.12 Gp10P1 (Mother) **: I just think chubbier kids are cuter. So I try to keep him a little chubby.
2.13 Gp07G1 (Mother's mother) *: [My daughter] was the only one, like I said that [she] was in the 95th percentile. She was the only one I ever wondered about, but she was cute chubby, that I didn't.
<b><i>Theme 3: Children go through 'growth spurts' and 'stretching out'</i></b>
3.2 Gp01P1 (Mother) ***: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and

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3 then they just grow like a tree, then they lean up.

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5 3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and  
6 down in his weight...but he usually gets plump and then has a growth spurt and so then it  
7 evens out. So I don't worry too much about it.

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9 3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a  
10 sudden they went a foot taller, and I think all the width went to height.

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12 3.9 Gp11G1 (Mother's mother) \*\*\*: we've never been concerned when she goes through  
13 those eating phases because we know it's her growth spurt and it's not like she's gaining  
14 weight this way (out) growing this way (up).  
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Table 3. Perceptions of the timeline of obesity, examples of participant quotes from each of the thematic categories and their constituent themes. The complete sets of pertinent participant quotes are provided as supplemental material.

<b><i>Theme 4: A high body weight becomes problematic later in childhood</i></b>
4.3 Gp01G1 (Father's mother) ***: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.
4.4 Gp01P1 (Father) ***: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.
4.6 Gp13P1 (Mother) ***: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."
4.8 Gp13G1 (Mother's mother) ***: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.
<b><i>Theme 5: Children's body weight becomes problematic when it affects their activities or health</i></b>
5.1 Gp03P1 (Mother) ***: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.
5.2 Gp11P1 (Mother) ***: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.
5.6 Gp01P1 (Father) ***: I think if they are happy within themselves and they're being active, I don't think it's really a concern.
<b><i>Theme 6: Obesity becomes problematic in adulthood</i></b>
6.3 Gp02P1 (Father) *: You're setting the foundation for what your body's going to be like as an adult.
6.6 Gp13G2 (Mother's father) ***: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. <i>Why?</i> Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.
6.8 Gp16G1 (Father's mother) ***: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole life.
6.9 Gp06P1 (Mother) **: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

Table 4. Perceptions of parental responsibility and blame for childhood obesity. Examples of participant quotes from each of the thematic categories and their constituent themes. The complete sets of pertinent participant quotes are provided as supplemental material.

<b><i>Theme 7: Parents have control over children's eating, physical activity, and body weights</i></b>
7.1 Gp01P1 (Mother) ***: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.
7.4 Gp02G1 (Father's mother) *: I think that if you buy a lot of junk food and that's what you have: soda, chips and things like that... and that's what your child is mostly eating, and they're getting overweight from that, then yes, you have a lot of control.
7.5 Gp04G3 (Mother's mother) *: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.
7.11 Gp04G2 (Mother's father) *: I see a lot of kids just go and play their computer games and TVs sitting down eating chips, and that's not the kid's fault.
7.13 Gp12G3 (Father's mother) ***: If you are active, the kids will be active. If you are into nutrition, the kids will be into nutrition.
7.14 Gp12P2 (Father) ***: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.
<b><i>Theme 8: The parents of obese children are blamed by themselves and by others</i></b>
8.1 Gp042 (Mother) *: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.
8.3 GP10G4 (Stepmother of the father) **: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.
8.4 Gp13P1 (Mother) ***: If I had a fat kid, it would be looking at me every day, "I'm a failure. I'm doing something wrong."
8.7 Gp13P1 (Mother) ***: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.
8.9 Gp11G1 (Mother's mother) ***: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on <i>The Biggest Loser</i> or something at 400 pounds because I was too lazy.

Table 5. Perceptions of appropriate contexts for speaking about preschoolers' body weights. Examples of participant quotes from each of the thematic categories and their constituent themes. The complete sets of pertinent participant quotes are provided as supplemental material.

<p><b><i>Theme 9: Parents and grandparents do not discuss preschoolers' body weights with them, unless the children raise the topic</i></b></p>
<p>9.1 Gp01G1 (Mother's mother) ***: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".</p>
<p>9.2 Gp03P1 (Mother) ***: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.</p>
<p>9.3 Gp13G1 (Mother's mother) ***: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".</p>
<p><b><i>Theme 10: It's acceptable to discuss how big or strong preschoolers are.</i></b></p>
<p>10.1 Gp12G2 (Father's father) ***: I can't say that it's [the child's weight] ever come up. Other than to say that "he's sure getting heavy", in growing up.</p>
<p>10.2 Gp12G3 (Father's mother) ***: We talk about how fit he is. He's a very fit child.</p>
<p>10.3 Gp13P1 (Mother) ***: His body shape is very athletic, so we go, "Yeah, look at his muscles".</p>
<p>10.4 Gp11G1 (Mother's mother) ***: we talk about her weight and her height a lot because she's a big girl, but not that we're concerned.</p>
<p>10.9 Gp16P1 (Father) **: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.</p>
<p><b><i>Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively</i></b></p>
<p>11.1 Gp03P1 (Mother) ***: So when he [the child] asks me stuff like that [about his weight] we talk about being strong versus being big and not strong. So it's all about trying to be strong and healthy so, that's what we talk about.</p>
<p>11.2 Gp03P2 (Father) ***: By far I don't think that parents should focus on it [weight] because then it will become a focal point for the child.</p>
<p>11.3 Gp01G1 (Father's mother) ***: I wouldn't sit with an iron fist and say, "You can't have that because it will make you fat." Because that effects their mental (wellbeing).</p>
<p>11.6 Gp14G1 (Mother's mother) **: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.</p>
<p>11.7 Gp02G1 (Father's mother) *: I probably wouldn't want to talk about her weight too</p>



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3 much because I do think that girls get set up in this world to worry a lot about that and that it  
4 could lead to some problems.  
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6 ***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each***  
7 ***other, unless there is a perceived problem***  
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9 12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a  
10 bit, personally, but I don't know because I haven't asked her.

11 12.5 Gp12G2 (Father's father) \*\*\*: I don't think about what his parents think about his  
12 weight. I know [his father] is certainly concerned with nutrition

13 12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the  
14 parents] – I am not sure they consider it an issue yet.

15 12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that  
16 because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

17 12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's  
18 weight]. (Interviewer: Not with [her husband]?) Um, [my daughter] and I have a closer, more  
19 intimate [connection], like [we can] talk about that kind of thing.  
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Table 6. Perceptions of young children's body sizes; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 1: Young children are 'pudgy' or 'big for their age', but not obese***

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...)But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.2 Gp07G1 (Mother's mother) \*: There are going to be kids, that are just by their DNA and genetics, that are a chunkier body build, stuff like that.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.4 Gp13G1 (Mother's mother) \*\*\*: [My daughter] was a larger child, she was never 'obese' or fat or whatever, she was never teased or anything like that.

1.5 Gp14P1 (Mother) \*\*: I think [my daughter] has got a big frame, she has big bones.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

1.7 GP10G4 (Father's stepmother) \*\*: But if a child is just built bigger, then you need to let that go and just realize that's how a child is made.

1.8 Gp01P1 (Mother) \*\*\*: she's also getting really tall, but I have a concern that she's getting a little pudgier (...) She's pudgy, she is a little overweight and we're working on it.

1.9 Gp03G01 (Mother's mother) \*\*\*: [My grandson] has a little bit of a weight issue.

1.10 Gp10G4 (Father's stepmother) \*\*: I think he is a short little toddler. He is a little bit round.

1.11 Gp10G1 (Father's mother) \*\*: Our middle son, when he was in 4th or 5th grade, he was a little chunky (...) He was 10.6 [lbs] when he was born and just a super stout, robust baby the minute he was born.

1.12 Gp13G2 (Mother's father) \*\*\*: He's not overweight at all, he's almost skinny, but he's tall, he's a tall kid. He's always been big and tall for his age.

1.13 Gp16P1 (Father) \*\*: I think it's just, he's a big boy, yeah they are big for their age.

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never

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been concerned about her weight.

1.15 Gp10P1 (Mother) \*\*: I think he has a good amount of weight on his bones. And he is normally big for his age.

1.16 Gp11P1 (Mother) \*\*\*: she has always been at the 90 or 100 percentile with her age group but in weight and always under in height. She has always been kind of short and stocky.

1.17 Gp03G1 (Mother's mother) \*\*\*: he's very big for his age. He's tall. People think he's six, he's only five.

### ***Theme 2: 'Baby fat' is cute and healthy***

2.1 Gp02P1 (Father) \*: she's got some cute baby fat but it's nothing to be worried about.

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.3 Gp05P3 (Mother's mother) \*: You know, she's got that little girl pudgy on her, that's so cute. Actually, I think a couple times this past year, I thought she might be a little underweight, because she didn't seem to have that little toddler pudgy.

2.4 Gp06P1 (Mother) \*\*: I don't worry about his weight right now, it's really hard at this age because I mean all of them are kinda pudgy.

2.5 Gp07P1 (Mother) \*: She's well within range, she's got that cute little extended abdomen of a toddler, you know.

2.6 Gp10G1 (Father's mother) \*\*: our kids were always in the 95th percentile... robust kids. I think he seems very healthy.

2.7 Gp13G1 (Mother's mother) \*\*\*: I think he's in the 50th percentile for weight and over a 100th for height.

2.8 Gp14P1 (Mother) \*\*: I think she is fine, she does have a little belly, but it's not anything I would worry about or say anything. (...) I think she is healthy, I think she is just a big strong girl.

2.9 Gp10P1 (Mother) \*\*: when he got chubby when he was younger, they [grandparents] just thought it was the cutest thing. You know... they are like... they just want to pinch his cheeks.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

2.13 Gp07G1 (Mother's mother) \*: [My daughter] was the only one, like I said that [she] was in the 95th percentile. She was the only one I ever wondered about, but she was cute chubby, that I

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didn't.

***Theme 3: Children go through 'growth spurts' and 'stretching out'***

3.1 Gp10P1 (Mother) \*\*: I really liked how chubby he was. It was really nice to cuddle. And I didn't worry about that. Because I figure when he would grow, that weight would just stretch out.

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.4 Gp11P1 (Mother) \*\*\*: When she starts getting kind of chunky I start waiting for that growth spurt because if it doesn't hit soon I get worried and start watching what she's eating.

3.5 Gp12P2 (Father) \*\*\*: When they're growing, they grow up and they grow out.

3.6 Gp14G1 (Mother's mother) \*\*: I know sometimes kids pudge and then they stretch out.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

3.8 Gp01P1 (Mother) \*\*\*: kids go through different phases and right now is a pudgy stage.

3.9 Gp11G1 (Mother's mother) \*\*\*: we've never been concerned when she goes through those eating phases because we know it's her growth spurt and it's not like she's gaining weight this way (out) growing this way (up).

3.10 Gp14G1 (Mother's mother) \*\*: I know when [my daughter] was in 5th grade, she got heavier, and then she stretched out in high school.

3.11 Gp06G1 (Mother's mother) \*\*: We can tell when he's about to go through a growth-spurt he gets that little teeny tummy.

Table 7. Perceptions of the timeline of obesity; the complete sets of pertinent participant quotes.

***Theme 4: A high body weight becomes problematic later in childhood***

4.1 Gp02G1 (Father's mother) \*: I think that when you see kids that are very overweight at 5, 7 and on up, that there's something going on with their eating. I think that when you have small children, like babies, who are plump, healthy babies, that's a whole different story. But I think that when they're older there's something to it.

4.2 Gp10G2 (Father's father) \*\*: Someone with a child [my grandson's] age... he is just 3... I

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don't know what data shows. Is there any issue with childhood obesity at that age? I don't know. When they talk about childhood obesity, later on, because humans go through all these different growth spurts

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.5 Gp01G1 (Mother's mother) \*\*\*: when they [obese children] get to school they're going to be teased (...) they're going to be the last ones picked for teams in school.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.7 Gp15G1 (Mother's mother) \*: as he starts to enter the schooling system that [weight] isn't an additional emotional piece of baggage that he has to carry... being ostracized in the area or personally feeling like different.

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.3 Gp05P1 (Mother) \*: if the weight is causing problems and issues in their body and ... then that's a problem.

5.4 Gp08P1 (Mother) \*: If she starts getting like, even more heavier, where I'm noticing maybe that she's depressed, or gaining weight more, or where if I see it affecting the way she looks at herself or her behavior with other kids, her activities, then I would be concerned.

5.5 Gp10P2 (Father) \*\*: If a kid is too fat to do much then it is not going to be healthy.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

5.7 Gp14P1 (Mother) \*\*: As long as they are healthy [weight is not an issue]; if you can visibly see that a child is overweight, and not getting enough activity, then that would matter.

***Theme 6: Obesity becomes problematic in adulthood***

6.1 Gp01P1 (Mother) \*\*\*: I do think that a child's weight matters. Just because you don't want them to develop unhealthy habits early because it's going to follow them for the rest of their life.

6.2 Gp01G2 (Father's mother) \*\*\*: I don't like seeing a child that age to start out being obese. It carries on with them so... I worry about healthy eating with them a little bit because of that.

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.4 Gp06P1 (Mother) \*\*: what motivated me is looking at my child and what I want him – who I want him to be in 25 years as a young man.

6.5 Gp10G2 (Father's stepfather) \*\*: If a child is not getting proper nutrition, especially during certain critical stages, you can have all kinds of long lasting effects, and yes that does speak to weight, certainly.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.7 Gp14G2 (Father's mother) \*\*: I think [weight matters] because what they learn as a child can carry on through their life. What they learn to eat.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

Table 8. Perceptions of parental responsibility and blame for childhood obesity; the complete sets of pertinent participant quotes.

***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.2 Gp01P1 (Father) \*\*\*: the parents and grandparents have control of what the children eat.

7.3 Gp02P1 (Father) \*: I think with proper feeding and keeping the proper foods in the house you can control the weight. If you have a bunch of snack foods and junk food all throughout the



house and people sit around and watch TV and eat food, you're controlling the weight there and not in a good way – you're going to get heavier.

7.4 Gp02G1 (Father's mother) \*: I think that if you buy a lot of junk food and that's what you have: soda, chips and things like that... and that's what your child is mostly eating, and they're getting overweight from that, then yes, you have a lot of control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.6 Gp06G1 (Mother's mother) \*\*: Just make them [fast foods] a treat, a special treat. Not because you are tired and don't want to cook, because then that becomes too easy for them.

7.7 Gp09G1 (Mother's mother) \*: I think if you sit down and eat as a family, you're not sitting in front of the TV feeding your face, so you're going to limit the amount... you're talking so you're not eating as much.

7.8 Gp13G1 (Mother's mother) \*\*\*: Yeah, a child's weight is easy to control, if you control what goes in and out of their mouth.

7.9 Gp14P1 (Mother) \*\*: She does like to eat, you could hand her a bag of cookies and put her in front of the TV, and she might sit there all day. Or she might not, I don't know, I've never done that. I could see if some parents were lazy, that might be an easy option. I think parents have a lot of influence on the weight of the child.

7.10 Gp13P1 (Mother) \*\*\*: They (parents) need to monitor what their child's eating and make sure they're being active.

7.11 Gp04G2 (Mother's father) \*: I see a lot of kids just go and play their computer games and TVs sitting down eating chips, and that's not the kid's fault.

7.12 Gp09P1 (Mother) \*: three year-olds should be running around, they should be active and they shouldn't be sitting on the couch eating Cheetos all day. So that's not a very healthy lifestyle and to each their own with parenting but in my personal opinion, I think it can be controlled.

7.13 Gp12G3 (Father's mother) \*\*\*: If you are active, the kids will be active. If you are into nutrition, the kids will be into nutrition.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

7.15 Gp15P1 (mother) \*: some kids will be more susceptible to gaining weight than others (...) but I think it's totally controllable what you're going to feed them.

***Theme 8: The parents of obese children are blamed by themselves and by others***

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- 8.1 Gp04P2 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.
- 8.2 Gp05G3 (Mother's mother) \*: Sometimes I see heavy parents who don't seem to exercise, and don't seem to eat right. And I see their children, and I say, "Oh my gosh, they are passing that down to the next generation."
- 8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.
- 8.4 Gp13P1 (Mother) \*\*\*: If I had a fat kid, it would be looking at me every day, "I'm a failure. I'm doing something wrong."
- 8.5 Gp04P2 (Mother) \*: I think most adults who are overweight can probably attribute it to their parents.
- 8.6 Gp11P1 (Mother) \*\*\*: I hate those parents who are like, "Well, she'll only eat at McDonald's." "No! She won't. You let her only eat at McDonald's. Or you let her only eat fruit snacks."
- 8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.
- 8.8 Gp13G2 (Mother's father) \*\*\*: to me, seeing an overweight six year old, it's like what is going on here? I think it's the adults, the parents, guardians, are the ones who have the most effect on that.
- 8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.
- 8.10 Gp03P1 (Mother) \*\*\*: They [medical staff] kept asking me what I was feeding him because he was getting so chubby (...) I kept thinking, "What am I doing wrong?"

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Table 9. Perceptions of appropriate contexts for speaking about preschoolers' body weights; the complete sets of pertinent participant quotes.

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***Theme 9: Parents and grandparents do not discuss preschoolers' body weights with them, unless the children raise the topic***

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- 9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".
- 9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he

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saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.

9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".

9.4 Gp09P1 (Mother) \*: I don't like this but she does have a fascination with my scale—she doesn't know what the numbers mean but she likes to get on there and I'll be like, "Oh my God, you gained a pound!" and she'll get excited (...) but I think she's still too young to know what (body) image is.

9.5 Gp01G1 (Father's mother) \*\*\*: I think she is totally oblivious to it [weight] which is good in a way.

9.6 Gp02P1 (Father) \*: I don't think she's noticed any difference between the her and her sister... she's not really conscious of it yet, she is just her.

9.7 Gp10P1 (Mother) \*\*: I don't think he thinks about his weight. We never talk about it. It is almost like nonexistent, especially at his age

9.8 Gp05P3 (Mother's mother) \*: She's very comfortable with her body. (...) I think she's aware that she has a body, and that it functions. (...) But I don't think she's really aware of, "oh, I'm too skinny, I'm too fat."

9.9 Gp14P1 (Mother) \*\*: I don't think she thinks anything of it. She is comfortable walking around the house with no clothes on. I don't think she thinks anything of it, she has never said anything.

***Theme 10: It's acceptable to discuss how big or strong preschoolers are***

10.1 Gp12G2 (Father's father) \*\*\*: I can't say that it's [the child's weight] ever come up. Other than to say that "he's sure getting heavy", in growing up.

10.2 Gp12G3 (Father's mother) \*\*\*: We talk about how fit he is. He's a very fit child.

10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, "Yeah, look at his muscles".

10.4 Gp11G1 (Mother's mother) \*\*\*: we talk about her weight and her height a lot because she's a big girl, but not that we're concerned.

10.5 Gp10G1 (Father's mother) \*\*: We might have in passing commented to how healthy he seems. I mean, just something sort of innocuous and nothing really of concern.

10.6 Gp04P1 (Father) \*: We talk about how he's growing and how he weighed and checked up.

10.7 Gp04P2 (Mother) \*: He [the child] just thinks it's a cool number. He gets excited to get weighed, "am I getting bigger?"

10.8 Gp04G3 (Mother's mother) \*: it's been awhile since we've talked about it. We used to talk



about it every time he came back from the doctor. The percentile he was in and such.

10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

10.10 Gp07G1 (Mother's mother) \*: She's [the child's mother] never, that I can think has ever expressed any concern about her weight. She makes comments, like "Boy, I can tell [the child] must be going through a growth spurt."

10.11 Gp09P1 (Mother) \*: They [grandparents] always joke and say that she looks just like Daddy because Daddy's kind of tall and lean.

***Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively***

11.1 Gp03P1 (Mother) \*\*\*: So when he [the child] asks me stuff like that [about his weight] we talk about being strong versus being big and not strong. So it's all about trying to be strong and healthy so, that's what we talk about.

11.2 Gp03P2 (Father) \*\*\*: By far I don't think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father's mother) \*\*\*: I wouldn't sit with an iron fist and say, "You can't have that because it will make you fat." Because that affects their mental (wellbeing).

11.4 Gp01P1 (Mother) \*\*\*: I have a concern that she's getting a little pudgier so I'm like, "If you're going to do milk, please go down to the skim or 1%, lay off the juice or dilute it", to start doing the things that she won't notice.

11.5 Gp14G2 (Father's mother) \*\*: I don't think a parent should badger them about their eating habits, I think there are ways to slowly and gradually make changes to lose weight rather than pointing it out.

11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.

11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much because I do think that girls get set up in this world to worry a lot about that and that it could lead to some problems.

***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a bit, personally, but I don't know because I haven't asked her.

12.2 GP10G4 (Stepmother of the father) \*\*: I never talk about his [the child's] weight.

12.3 Gp06P1 (Mother) \*\*: No, I don't think she [grandmother] thinks he's at an unhealthy

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weight. (...) She's never said anything to me.

12.4 Gp12G3 (Father's mother) \*\*\*: I think they [the parents] should be very pleased with it [the child's weight], but I don't know.

12.5 Gp12G2 (Father's father) \*\*\*: I don't think about what his parents think about his weight. I know [his father] is certainly concerned with nutrition

12.6 Gp07P1 (Mother) \*: I think that my mom probably would think it [the child's weight] doesn't matter. (...) [I]t's never something we discuss.

12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the parents] – I am not sure they consider it an issue yet.

12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's weight]. (*Interviewer: Not with [her husband]?*) Um, [my daughter] and I have a closer, more intimate [connection], like [we can] talk about that kind of thing.

# BMJ Open

## "A little on the heavy side": A Qualitative Analysis of Parents' and Grandparents' Perceptions of Preschoolers' Body Weights

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2014-006609.R1
Article Type:	Research
Date Submitted by the Author:	24-Oct-2014
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<b>Primary Subject Heading</b>:	Public health
Secondary Subject Heading:	Qualitative research
Keywords:	PAEDIATRICS, Community child health < PAEDIATRICS, PRIMARY CARE, PUBLIC HEALTH

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Manuscripts

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3 1 “A little on the heavy side”: A Qualitative Analysis of Parents’ and Grandparents’  
4 2 Perceptions of Preschoolers’ Body Weights  
5 3

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1  
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3 19 **Abstract**  
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8 **OBJECTIVES:** Parents' difficulties in perceiving children's weight status accurately pose a  
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10 barrier for family-based obesity interventions; however, the factors underlying weight  
11  
12 misinterpretation still need to be identified. This study's objective was to examine parents and  
13  
14 grandparents' perceptions of preschoolers' body sizes. Interview questions also explored  
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16 perceptions of parental responsibility for childhood obesity and appropriate contexts in which  
17  
18 to discuss preschoolers' weights.  
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20  
21 **DESIGN:** Semi-structured interviews, which were videotaped, transcribed, and analyzed  
22  
23 qualitatively.  
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26 **SETTING:** Eugene and the Springfield metropolitan area, Oregon, USA  
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29 **PARTICIPANTS:** Families of children aged 3-5 years were recruited in February – May  
30  
31 2011 through advertisements about the study, published in the job seekers' sections of  
32  
33 Craigslist and local newspapers. 49 participants (22 parents and 27 grandparents, 70%  
34  
35 women, 60% with overweight/obesity) from sixteen low-income families of children aged 3-5  
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37 years (50% girls, 56% with overweight/obesity) were interviewed.  
38

39  
40 **RESULTS:** There are important gaps between clinical definitions and lay perceptions of  
41  
42 childhood obesity. While parents and grandparents were aware of their preschoolers' growth  
43  
44 chart percentiles, these measures did not translate into recognition of children's overweight or  
45  
46 obesity. The participants spoke of obesity as a problem that may affect the children in the  
47  
48 future, but not at present. Participants identified childhood obesity as being transmitted from  
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50 one generation to the next, and stigmatized it as resulting from 'lazy' parenting. Parents and  
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52 grandparents avoided discussing the children's weights with each other and with the children  
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54 themselves.  
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3 43 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with  
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5 44 parents and grandparents about the meaning and appearance of obesity in early childhood, as  
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7 45 well as counteract the social stigma attached to obesity, in order to improve the effectiveness  
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9 46 of family-based interventions to manage obesity in early childhood.  
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For peer review only

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3 49 **Strengths and limitations of this study**  
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- This study's sample is the largest ever reported in a qualitative investigation of family members' perceptions of preschoolers' body weights.
  - While most previous studies focused only on mothers' perceptions of their preschoolers' body weights, this study included mothers, fathers, grandmothers, and grandfathers, recognizing that various adult family members influence young children's body image, eating, and exercise habits.
  - Although low-income participants tend to be difficult to reach, the study successfully recruited a predominantly low-income sample.
  - The sample primarily consisted of families of Caucasian origin, and thus did not allow for an investigation of the influence of cultural background on perceptions of children's body sizes.
  - As several participants were single mothers, the number of fathers was not high enough to enable an assessment of potential differences between fathers' and mothers' perceptions.

## 66 INTRODUCTION

67

68 While there is growing evidence of the superior effectiveness of lifestyle interventions  
69 initiated early in childhood<sup>1-3</sup>, one of the main barriers in conducting such interventions is  
70 parents' lack of recognition of, or concern about, obesity in children. Parents' difficulties in  
71 perceiving children's body sizes accurately have been demonstrated since the early 2000s,  
72 across many countries, cultures and child ages<sup>4-6</sup>. A recent study of over 16,000 children aged  
73 2-9 years from eight European countries has shown that, among parents of overweight  
74 children, 63% perceived their children's weights as 'proper', independent of educational  
75 level<sup>7</sup>. Moreover, a meta-analysis of 69 studies on parental perceptions of children's body  
76 weights showed that half of the parents underestimated their children's weight.<sup>8</sup>

77

78 Most studies have applied a quantitative approach to describe parents' miscategorization of  
79 children's weight status; however, the underlying factors have not been identified  
80 conclusively<sup>6</sup>. To date, only two studies<sup>9 10</sup> have used in-depth interviews to examine how  
81 parents make sense of children's body weights and their health implications. In their study of  
82 low income mothers, Jain et al have shown that most mothers did not worry about their  
83 children's body weights if the children were active and socially accepted; the mothers,  
84 moreover, distrusted pediatric growth charts, and attributed childhood obesity to genetics,  
85 rather than to factors modifiable in the home environment<sup>9</sup>. Misinterpretation of growth  
86 charts was also highlighted by Rich et al, who found that 80% of parents perceived their child  
87 as healthy although the child's weight was at the 95<sup>th</sup> percentile. These parents, notably, were  
88 aware of obesity related health risks<sup>10</sup>. More recently, focus groups revealed that, in assessing  
89 their children's body sizes, parents tend not to rely on clinical measurements; rather, they



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3 90 often compare their children visually to other children whose body sizes can be defined as  
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5 91 extreme, thus skewing their perceptions of what a healthy body size is<sup>11</sup>.  
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9 93 So far, existing research on parental perceptions of children's body weights has focused  
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11 94 almost exclusively on mothers, and has not examined the critical influence of other family  
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13 95 members, such as fathers and grandparents<sup>12</sup>. Because family-based interventions have been  
14  
15 96 proposed as the most effective approach to treating child obesity<sup>13 14</sup>, knowledge about how  
16  
17 97 other adult caretakers perceive and discuss young children's body weights will contribute to  
18  
19 98 understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-  
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21 99 judgmental communication about children's eating practices and body sizes is important for  
22  
23 100 the prevention of body dissatisfaction and disordered eating in childhood and adolescence<sup>15 16</sup>.

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25 101 To examine caretakers' perceptions of young children's body weights from a broader familial  
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27 102 perspective, we designed this study to include family sets of parents and grandparents actively  
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29 103 involved in taking care of preschool age children. This study was part of a larger research  
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31 104 project, whose overall aim was to evaluate the role of grandparents in the development of  
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33 105 preschoolers' lifestyle early in life. The larger research project yielded rich material on the  
34  
35 106 participants' perceptions of young children's body weights, and we found this topic merited  
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37 107 dedicated discussion apart from the larger study.

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39 108 As childhood obesity remains high among families with low socioeconomic status<sup>17-19</sup>, and as  
40  
41 109 it is more difficult to recruit and retain these families in intervention programs<sup>20 21</sup>, we chose  
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43 110 to target a low income population.  
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## 50 112 **METHODS**

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3 114 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield  
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5 115 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements  
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7 116 about the study, published in a local newspaper and the volunteers' and job seekers' sections  
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9 117 of Craigslist (the most widely used classified advertisement website in the United States). The  
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11 118 active involvement of grandparents in family life (defined as spending time with the  
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13 119 grandchild at least twice a month) was the primary criterion for inclusion in the study.  
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15 120 Consequently, only families in which at least one parent and one grandparent were willing to  
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17 121 be interviewed were included in the study. The other inclusion criteria specified that the  
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19 122 child's age must be between 3-5 years, and that the child should have no underlying medical  
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21 123 condition or disability which would affect his/her weight. All families who contacted the  
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23 124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.  
24  
25 125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.  
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27 126 When the participants first met with the researchers, and before the interviews took place, the  
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29 127 researchers verbally explained the informed consent forms to each participant, and answered  
30  
31 128 any questions participants had . If the parents/grandparents agreed to participate, they were  
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33 129 asked to read and sign the written project description and project consent forms. The families  
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35 130 received a copy of the written study description and informed consent forms.  
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37 131  
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39 132 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.  
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41 133 Free child care was provided on site, and the children were not present during the interviews.  
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43 134 Each interviewed participant received compensation of \$50 for participating in the study.  
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45 135 Prior to the interview, parents and grandparents completed a comprehensive  
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47 136 sociodemographic questionnaire routinely used in research projects involving families at the  
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49 137 Oregon Social Learning Center; the questionnaire included items concerning family  
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51 138 composition, parental education, employment status, and living conditions. All the  
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3 139 interviewed parents and grandparents as well as the preschooler in focus had their height and  
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5 140 weight measured, without shoes and wearing only light clothing, by trained research staff  
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7 141 prior to the interviews. The weight status using height and weight was not calculated prior the  
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9 142 interview, thus the interviewer and the family members were not informed about the child's or  
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11 143 family members' weight status. The interviews, which were conducted by a single researcher  
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13 144 (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of  
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15 145 family members in shaping a child's lifestyle. Before coding, all participant names were  
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17 146 changed to ensure confidentiality.  
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23 148 This paper focuses on the parents' and grandparents' perceptions of young children's body  
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25 149 weights, with particular emphasis on overweight and obesity, parental responsibility for  
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27 150 childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body  
28  
29 151 weights. The main questions were: (1) Do you think that how much a child weighs matters? If  
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31 152 yes, why? If not, why? (2) How much do you think that a child's weight is possible to  
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33 153 control/controllable? If yes, what lifestyle choices do you think are the most important?  
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35 154 How/when do you think they can be promoted, and who do you think can do that? And who  
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37 155 in the family plays the most important role when it comes to influencing the child's weight? If  
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39 156 no, what makes you think that way? (3) What do you think about your child's (or  
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41 157 grandchild's) weight? As compared to his/her siblings, cousins, other children, to the child's  
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43 158 parents. Are you concerned/not concerned? (4) What do you think that the parents of your  
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45 159 grandchild think about your grandchild's weight (or grandparents of your child about your  
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47 160 child's weight)? Examine: If there are two parents (grandparents) in the house, do they have  
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49 161 the same opinion? (5) Do you talk about your child (grandchild's) weight with his/her  
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51 162 grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two parents in  
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53 163 the house, which of them do you talk the most with and why? (6) Do you know if your child  
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3 164 (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it? Did that  
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5 165 happen in your presence? If yes, what did you say? If your child doesn't think about his/her  
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7 166 weight, is it good or bad?  
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11 168 It should be noted that while all participants were asked the same main questions, the  
12  
13 169 interview process allowed for fluidity, and follow-up questions were adapted according to  
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15 170 each participant's responses. Additionally, while the majority of data directly refer to the main  
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17 171 questions listed, the present analysis includes pertinent comments the participants made  
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19 172 throughout the interviews. The interviews were videotaped and transcribed in full;  
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21 173 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this  
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23 174 paper, transcript sections that related to the main questions were extracted and collated. The  
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25 175 transcripts were then coded independently by the first and the last author, using a thematic  
26  
27 176 discourse analysis approach. Discourse analysis is concerned with people's use of language to  
28  
29 177 describe and make sense of their realities, and is an appropriate approach for qualitative  
30  
31 178 studies that examine people's definitions of and spoken attitudes towards health issues<sup>22</sup>.  
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33 179 Thematic analysis facilitates the identification of patterns in qualitative data, and therefore  
34  
35 180 allowed the researchers to delineate themes across the data set<sup>23</sup>. Over several in-person  
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37 181 meetings and email correspondence, the two coders compared and discussed their codes, to  
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39 182 examine and resolve potential disagreements, and reach consensus on the clustering of codes  
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41 183 into themes and on the grouping of themes under thematic categories.  
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## 49 185 **RESULTS**

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51 186 In total, 49 family members (70% female) from sixteen families were interviewed. The  
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53 187 sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation  
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55 188 <sup>24</sup>. Seven families consisted of single parent with sole responsibility for the child (five single  
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3 189 mothers and two single fathers). In ten families, only one grandparent was interviewed; in two  
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5 190 families, two grandparents were interviewed; in three families, three grandparents were  
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7 191 interviewed; and in one family, four grandparents were interviewed. In five of the families, all  
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9 192 grandparents who had contact with the grandchild were interviewed. The most common  
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11 193 reason for not being able to include full sets were the other grandparents' residing outside the  
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13 194 study area.

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18 196 Participants' characteristics are summarized in Table 1. All data refer to parents and  
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20 197 grandparents who were interviewed as part of the study. Due to the targeted recruitment  
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22 198 process (ads in job advertisement sections) the sample displayed low levels of education and  
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24 199 income; as many as 50% of parents were unemployed. The majority of children, parents and  
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26 200 grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific  
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28 201 Northwest.

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34 203 All the interviewed parents and grandparents as well as the preschooler in focus had their  
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36 204 height and weight measured, without shoes and wearing only light clothing, by trained  
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38 205 research staff prior to the interviews. These measurements were taken in order to  
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40 206 contextualize the participants' stated perceptions of and attitudes toward childhood  
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42 207 overweight/obesity and associated lifestyle factors. The participants' and the children's BMI  
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44 208 statuses were not calculated prior to the interviews, so as not to bias the interview process.  
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46 209 Thus, the interviewers and the participants were not informed about the child's or any of the  
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48 210 adult family members' weight status. More than half of parents and two thirds of grandparents  
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50 211 had overweight or obesity, according to World Health Organization criteria<sup>25</sup>. Of the children,  
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52 212 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile  $\leq$  Body Mass Index (BMI)

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3 213 < 95th percentile; obesity: BMI  $\geq$  95th percentile)<sup>26-28</sup>; those five who were categorized as  
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5 214 obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.  
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10 216 *Insert Table 1 here.*  
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14 218 The analysis yielded twelve major themes, clustered under four thematic categories:  
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16 219 Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions  
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18 220 of parental responsibility and blame for childhood obesity, and perceptions of appropriate  
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20 221 contexts for speaking about preschoolers' body weights. While the number of fathers was not  
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22 222 high enough to enable an assessment of differences between fathers' and mothers' perceptions  
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24 223 and attitudes, it is possible to say that the participants' responses were consistent across the  
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26 224 sample, and no generational differences were observed between the parents' and the  
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28 225 grandparents' perceptions of their preschoolers' body sizes. Examples of participant quotes  
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30 226 from each of the thematic categories and their constituent themes are presented in table format  
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32 227 (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental  
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34 228 material (Supplementary Tables 1-4).  
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47 230 *Insert Tables 2-5 here.*  
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### 233 **Perceptions of young children's body sizes (Table 2)**

234 None of the participants used the words 'obese' or 'overweight' to describe the preschoolers  
235 whom the growth charts defined as such. The participants used a range of words to describe  
236 the body sizes of these preschoolers, including 'pudgy', 'chunky', 'solid', 'stout', 'chubby',  
237 'stocky', 'big boned', and 'robust'. Several participants described the preschoolers as 'tall'

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3 238 and/or 'big for their age'. Notably, even the father of the heaviest child in the sample (99<sup>th</sup>  
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5 239 percentile) described his child as 'a little on the heavy side'. Across the sample, including the  
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7 240 parents and grandparents of normal weight children, the participants spoke of 'baby fat' as  
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9 241 cute and healthy, and even as something to encourage. A few participants also spoke of  
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11 242 children's higher percentiles on the growth charts (>90<sup>th</sup> percentile) in positive terms. The  
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13 243 parents and grandparents of the overweight or obese preschoolers said their body weight was  
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15 244 not worrisome because children go through 'growth spurts' and 'stretch out', such that their  
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17 245 current excess weight will eventually convert into height.  
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### 22 23 247 **Perceptions of the timeline of obesity (Table 3)**

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25 248 The participants spoke of obesity as a problem that may affect the preschoolers in the future,  
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27 249 but not at present. Several participants indicated that a high body weight becomes problematic  
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29 250 when the child reaches school age, particularly due to the risk of teasing, social exclusion, and  
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31 251 bullying. Participants also said that a high body weight becomes problematic when it  
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33 252 negatively affects the child's health, activities, behaviors, or mood. However, only one  
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35 253 participant, whose child was in the 99<sup>th</sup> percentile for weight, said that she could notice the  
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37 254 detrimental effects of the child's body weight at present. Thus, even when speaking of obesity  
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39 255 in terms of impact on activity and health, the participants placed it outside the remit of the  
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41 256 preschoolers' current experience. Participants also spoke of obesity as problematic due to its  
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43 257 manifestations in adulthood, expressing that children's body weights and their eating and  
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45 258 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing]  
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47 259 more trouble as an adult'.  
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### 53 54 261 **Perceptions of parental responsibility and blame for childhood obesity (Table 4)**

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3 262 The participants identified parents as bearing primary responsibility for their children's eating  
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5 263 and exercise habits and for their body weights. Even those participants who spoke of body  
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7 264 size as being affected by genetics asserted that parents can still influence their children's body  
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9 265 weights. Likewise, participants who mentioned that children may be overweight or obese due  
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11 266 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making  
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13 267 sure the child's medical problem is identified and resolved. The participants argued that  
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15 268 parents are responsible for children's body weights because they can control what their  
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17 269 children eat, provide a healthy food environment at home, encourage their children to play  
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19 270 outside and be active, and model healthy behaviors themselves.  
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25 272 The participants' concepts of parental responsibility linked with their attitudes towards  
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27 273 parental blame for childhood obesity. Several participants said they 'judged' parents whose  
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29 274 children were obese; some even said that the parents of obese children were guilty of child  
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31 275 neglect or abuse. Participants identified childhood obesity as being transmitted from one  
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33 276 generation to the next, and as the result of 'lazy' parenting. Having an obese child was an  
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35 277 outward sign of 'failing' as a parent, and one mother whose child was obese spoke of feeling  
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37 278 blamed by clinicians for the child's weight gain, which, as she said, neither she nor the child's  
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39 279 clinicians could explain.  
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## 282 **Perceptions of appropriate contexts for speaking about preschoolers' body weights**

### 283 **(Table 5)**

284 The participants described discussions of preschoolers' body weights as sensitive, often  
285 unnecessary, and potentially dangerous. The decision to engage in discussion about children's  
286 body weights was context dependent. Participants said they discussed their children's or  
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3 287 grandchildren's body weights with them only if the children themselves raised the topic.  
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5 288 Those participants whose preschoolers did not mention body weight said they had never  
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7 289 discussed the issue with them. Several participants said that children of preschool age do not  
8  
9 290 have body image concepts related to weight. Some participants cited their preschoolers'  
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11 291 'apparent 'comfort' with – or lack of self-consciousness about – their bodies as signaling a  
12  
13 292 lack of concern with body image. A number of participants also said they avoided discussions  
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15 293 of their preschoolers' body weights because these discussions could be harmful to the  
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17 294 children's self-esteem and emotional wellbeing.  
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23 296 Notably, excepting the parents of the two children with the height weight statuses, all parents  
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25 297 avoided discussing their children's body weights not only with the children themselves, but  
26  
27 298 also with the children's grandparents; likewise, excepting one grandmother, all grandparents  
28  
29 299 avoided discussing their grandchildren's body weights with the parents. Participants described  
30  
31 300 these discussions as unnecessary when body weight was 'not an issue'. It was only when a  
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33 301 child's body weight was perceived as problematic (in the case of the largest child in the  
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35 302 sample) that parents and grandparents said they openly discussed it with each other. However,  
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37 303 while most participants said they did not discuss body weights, they identified comments on  
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39 304 children's 'healthy' appearance, growth, or muscle definition as appropriate and positive.  
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41 305 Thus, although participants were reluctant to discuss the preschoolers' body weights, they did  
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43 306 discuss the preschoolers' body sizes, with attention to how 'big' or 'strong' they were.  
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51 309 **DISCUSSION**

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3 311 This study's findings suggest that the parents and grandparents of preschool age children face  
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5 312 difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous  
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7 313 research has found that low income mothers are not concerned about preschoolers'  
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9 314 overweight because they attribute body weight to genetic heredity<sup>9</sup>. However, in this study,  
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11 315 the participants strongly endorsed the idea that parents bear primary responsibility for their  
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13 316 children's eating and exercise habits and body weights. Nevertheless, the participants did not  
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15 317 speak of their own children or grandchildren as overweight or obese. Notably, the  
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17 318 participants' responses were consistent across the sample, and no generational differences  
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19 319 were observed between the parents' and the grandparents' perceptions of their preschoolers'  
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21 320 body sizes.  
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27 322 Although the participants recognized obesity in general as a problem, they normalized their  
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29 323 own children's and grandchildren's excess body weight as 'toddler pudge' or 'cute baby fat'.  
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31 324 Like Jain et al<sup>9</sup>, the authors of the present study suggest that most participants used these  
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33 325 words not as euphemisms, as underscored by the participants' consistent descriptions of  
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35 326 children's higher body weights in positive terms – as 'cute' or 'healthy'. While participants  
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37 327 said that preschoolers' body weights would be problematic if the child became 'visibly  
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39 328 overweight', it was less clear how a 'visibly overweight' preschooler might look. The  
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41 329 participants' discussions focused, instead, on signs that might negate 'visible overweight' in a  
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43 330 preschooler, including tallness, muscularity, and physical strength. As noted by Jones et al<sup>11</sup>,  
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45 331 when participants described obesity, it was through extreme cases of morbid obesity in later  
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47 332 childhood or adulthood, with some citing examples of older children who were 'miniatures of  
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49 333 their parents' and contestants on *The Biggest Loser* who weighed 400 lbs. Future research  
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51 334 should explore how a 'visibly overweight' preschooler might look to parents and  
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53 335 grandparents.  
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337 Just as the participants visualized obesity through images of older children or adults, they also  
338 spoke of obesity as a problem that might affect children later in life, but not in preschool age.

339 Participants spoke of suffering from teasing as a school age child, or from poor health as an  
340 adult, as the consequences that marked obesity as a problem. While participants did say that  
341 they would recognize a body weight problem if their preschoolers showed negative changes in  
342 behavior, activity, and mood, they did not name immediate health risks. The participants'  
343 depictions of obesity revealed a disconnect between knowledge and perception, previously  
344 shown by Rich et al<sup>10</sup>. Although they were aware of their preschoolers' growth chart  
345 percentiles, most participants did not link these percentiles with the categories of 'overweight'  
346 and 'obesity'. Likewise, although participants were aware of the health risks associated with  
347 obesity in adulthood, they did not link their preschoolers' body weights with potential  
348 problems in the present tense.

349

350 While the participants did not associate obesity with early childhood, they did take  
351 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise  
352 practices. Along similar lines, however, the participants – including some whose children  
353 were classified as obese –blamed parents for childhood obesity. The participants' expressions  
354 of judgment toward the parents of obese children were aligned with broader social stigma  
355 attached to obesity<sup>29 30</sup>. Given the participants' stigmatizing attitudes, it is not surprising that  
356 they did not discuss their preschoolers' body weights with other family members. Although  
357 parents and grandparents did discuss children's body sizes through comments on how 'big',  
358 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were  
359 classified as overweight or obese did not discuss their body weights with family members,  
360 except when there was a perceived health problem. It is possible that, for the participants,

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3 361 discussion of body weight threatened to expose both themselves and their children to the risk  
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5 362 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is  
6  
7 363 important to note that, in deciding not to discuss body weight with their preschoolers (unless  
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9 364 the children themselves raised the topic), the participants protected the children's body image  
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11 365 and self-esteem. Moreover, like the parents described by Andreassen et al <sup>31</sup>, those parents  
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13 366 who recognized their children needed to lose weight attempted to enact weight loss strategies  
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15 367 without explicitly mentioning weight. As previous studies have shown, parental comments  
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17 368 about body weight are associated with body dissatisfaction and reduced self-esteem in  
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19 369 children<sup>15 32 33</sup>, such that the participants' stance on avoiding 'weight talk' with children was  
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21 370 positive and should be encouraged. A recent study has proposed a set of guidelines to help  
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23 371 parents discuss body image and eating with preschool aged children in a supportive way that  
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25 372 is protective of children's self-esteem<sup>16</sup>.

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374 The results of this study suggest that there are important gaps between clinical definitions and  
375 lay perceptions of childhood obesity. While parents and grandparents are aware of their  
376 preschoolers' growth chart percentiles, these measures do not translate into recognition of  
377 young children's overweight or obesity. Without visual examples of how a preschool age  
378 child with overweight or obesity might look, such as sketched silhouettes or photographs at  
379 different weight categories<sup>34-36</sup>, parents and grandparents continue to speak of children's  
380 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later  
381 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss  
382 young children's body weights with the children and with one another, this might affect the  
383 success of clinical interventions for childhood obesity, in which children's caretakers are  
384 forced into a new and uncomfortable discussion.

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3 386 The clinical implications of this study include several components. In discussions with parents  
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5 387 and grandparents of preschool age children, clinicians should clarify how children's fat  
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7 388 distribution and body sizes typically change with age. Clinicians should also speak with  
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9 389 children's caretakers about the meaning of growth chart percentiles, and provide visual  
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11 390 examples of how children might look in each of the percentile categories. Moreover,  
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13 391 clinicians should emphasize the immediate problems associated with obesity in early  
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15 392 childhood, such as hypertension (present in more than 50% of children with obesity),  
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17 393 dyslipidemia, motor skill development and orthopedic complications<sup>37-39</sup>.  
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23 395 The results also suggest that the countering of stigma should be an important part of the  
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25 396 clinical management of childhood obesity. Given the social stigma and blame attached to  
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27 397 parents of children with obesity, parents might contest a child's obesity diagnosis and be  
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29 398 reluctant to take part in interventions to manage their child's condition<sup>40</sup>. It is therefore crucial  
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31 399 that clinicians directly address stigma when they speak to parents, emphasizing that childhood  
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33 400 obesity is not the parents' fault, and that managing this condition together is a positive step.  
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35 401 Similarly, clinicians should avoid addressing parents of children with obesity in ways that  
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37 402 might make them feel guilty or judged. Finally, it is important that clinicians frame  
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39 403 discussions of children's body weights sensitively, and encourage parents and grandparents to  
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41 404 address children's eating and physical activity practices through positive words and actions,  
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43 405 without emphasizing body weight to the children themselves.  
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49 407 This study had some limitations. While the sample was the largest ever reported in a  
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51 408 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning  
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53 409 preschoolers' body weights, the families were mainly of Caucasian origin, representing the  
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55 410 ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence  
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3 411 of cultural background on perceptions of children's body sizes, which several studies have  
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5 412 identified as important<sup>5 18 30</sup>, could not be investigated. As the study targeted families of low  
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7 413 socioeconomic status, further research is needed to determine whether the results can be  
8  
9 414 generalized to other populations. Additionally, as several participants were single mothers, the  
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11 415 number of fathers was not high enough to enable an assessment of differences between  
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13 416 fathers' and mothers' perceptions and attitudes. Finally, while a number of families had a full  
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15 417 or nearly-full set of grandparents participating, some had only one or two grandparents  
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17 418 participating, due to circumstances such as the other grandparents' living outside the area.  
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## 22 420 **CONCLUSION**

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27 422 This study was the first to focus on both parents' and grandparents' perceptions of  
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29 423 preschoolers' body weights, and is the largest qualitative study to date to include a mixed  
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31 424 familial sample of adult caretakers of preschool age children. The study's results demonstrate  
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33 425 that while parents and grandparents recognize childhood obesity as problematic, endorse  
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35 426 healthy eating and exercise habits, and take responsibility for children's body weights, they  
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37 427 find it difficult to recognize and discuss young children's overweight and obesity. The results  
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39 428 suggest that clinicians should clearly communicate with parents and grandparents about the  
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41 429 meaning and appearance of obesity in early childhood, as well as counteract the social stigma  
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43 430 attached to obesity, in order to improve the effectiveness of family-based interventions to  
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45 431 manage obesity in early childhood.  
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## 51 433 **ACKNOWLEDGMENTS**



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3 434 We thank all the participating families, as well as Eliah Prichard, Jessica Farmer, Kelly  
4  
5 435 Underwood, Bryn Shepherd and Waihan Leung, the University of Oregon students who  
6  
7 436 transcribed the interviews.  
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### 11 439 **CONTRIBUTORSHIP STATEMENT**

12  
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15  
16 440 Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote  
17  
18 441 the manuscript, and approved the final manuscript as submitted.

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21 442 Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the  
22  
23 443 manuscript, and approved the final manuscript as submitted.

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25 444 Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed  
26  
27 445 the manuscript and approved the final manuscript as submitted.

28  
29 446 Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and  
30  
31 447 supervised data collection and analysis, coded the interviews and analyzed them together with  
32  
33 448 Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.

34 449

### 35 450 **COMPETING INTERESTS**

36  
37 451 We have read and understood BMJ policy on declaration of interests and declare that we have  
38  
39 452 no competing interests.  
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41 453

### 42 454 **FUNDING**

43  
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47 455 This work was supported by grants to PN from the Sweden-America Foundation, the Oregon  
48  
49 456 Social Learning Center and the Marie Curie VINNMER International Qualification (2011-  
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51 457 03443).  
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459 **DATA SHARING**

460 Online supplementary table S1-4 containing complete sets of pertinent participant quotes. No  
461 additional data available.

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463 **REFERENCES**

- 464 1. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al.  
465 Interventions for preventing obesity in children. *Cochrane Database Syst Rev*  
466 2011;12:CD001871.
- 467 2. Reinehr T, Kleber M, Lass N, Toschke AM. Body mass index patterns over 5 y in obese  
468 children motivated to participate in a 1-y lifestyle intervention: age as a predictor of  
469 long-term success. *Am J Clin Nutr* 2010;91(5):1165-71.
- 470 3. Danielsson P, Svensson V, Kowalski J, Nyberg G, Ekblom O, Marcus C. Importance of age  
471 for 3-year continuous behavioral obesity treatment success and dropout rate. *Obes*  
472 *Facts* 2012;5(1):34-44.
- 473 4. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight  
474 status of children: a metasynthesis of the current research. *J Am Acad Nurse Pract*  
475 2009;21(3):160-6.
- 476 5. Parry LL, Netuveli G, Parry J, Saxena S. A systematic review of parental perception of  
477 overweight status in children. *J Ambul Care Manage* 2008;31(3):253-68.
- 478 6. Towns N, D'Auria J. Parental perceptions of their child's overweight: an integrative review  
479 of the literature. *J Pediatr Nurs* 2009;24(2):115-30.
- 480 7. Regber S, Novak M, Eiben G, Bammann K, De Henauw S, Fernandez-Alvira JM, et al.  
481 Parental perceptions of and concerns about child's body weight in eight European  
482 countries--the IDEFICS study. *Pediatr Obes* 2013;8(2):118-29.
- 483 8. Lundahl A, Kidwell KM, Nelson TD. Parental underestimates of child weight: a meta-  
484 analysis. *Pediatrics* 2014;133(3):e689-703.
- 485 9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-  
486 income mothers worry about their preschoolers being overweight? *Pediatrics*  
487 2001;107(5):1138-46.
- 488 10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of  
489 health status and play activities in parents of overweight Hispanic toddlers and  
490 preschoolers. *Fam Community Health* 2005;28(2):130-41.
- 491 11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental  
492 perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes*  
493 *(Lond)* 2011;35(7):953-62.
- 494 12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding  
495 healthy behaviours for preventing overweight and obesity in young children: a  
496 systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
- 497 13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al.  
498 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
499 2009(1):CD001872.
- 500 14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of  
501 Nutrition and Dietetics: interventions for the prevention and treatment of pediatric  
502 overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.

- 1  
2  
3 503 15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary  
4 504 school children. *Int J Eat Disord* 1999;25(3):263-71.
- 5 505 16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body  
6 506 dissatisfaction and unhealthy eating patterns in preschool children: A Delphi  
7 507 consensus study. *Body Image* 2014;11(4):418-25.
- 8 508 17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in  
9 509 body weight of German children reverse direction between the ages of 2 and 6 years. *J*  
10 510 *Nutr* 2003;133(3):789-96.
- 11 511 18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity  
12 512 among young U.S. children living in low-income families, 2008-2011. *Pediatrics*  
13 513 2013;132(6):1006-13.
- 14 514 19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development  
15 515 of socioeconomic inequalities in obesity among Dutch pre-school and school-aged  
16 516 children *Obesity (Silver Spring)* 2014;In press
- 17 517 20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions  
18 518 for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.
- 19 519 21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al.  
20 520 Strategies for Recruitment and Retention of Families from Low-Income, Ethnic  
21 521 Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child  
22 522 Weight. *Child Health Care* 2013;42(3):198-213.
- 23 523 22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse  
24 524 analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
- 25 525 23. Braun V, Clarke V. Using thematic analysis in psychology. . *Qualitative Research in*  
26 526 *Psychology* 2006;3(2):77-101.
- 27 527 24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with  
28 528 data saturation and variability. *Field Methods* 2006;18(1):59-82.
- 29 529 25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. .  
30 530 *World Health Organ Tech Rep Ser*, 2000:1-253.
- 31 531 26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al.  
32 532 CDC growth charts: United States. *Adv Data* 2000(314):1-27.
- 33 533 27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000  
34 534 CDC Growth Charts for the United States: methods and development. *Vital Health*  
35 535 *Stat II* 2002(246):1-190.
- 36 536 28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child  
37 537 and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.
- 38 538 29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull*  
39 539 2007;133(4):557-80.
- 40 540 30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*  
41 541 2009;17(5):941-64.
- 42 542 31. Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and  
43 543 strategies when helping their overweight children lose weight. *Qual Health Res*  
44 544 2013;23(10):1333-43.
- 45 545 32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old  
46 546 girls. *Pediatrics* 2001;107(1):46-53.
- 47 547 33. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family  
48 548 weight talk and dieting: how much do they matter for body dissatisfaction and  
49 549 disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.
- 50 550 34. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents'  
51 551 perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.

- 1  
2  
3 552 35. Warschburger P, Kroller K. Maternal perception of weight status and health risks  
4 553 associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.  
5 554 36. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about their  
6 555 child's weight: distinguishing facts from values. *Child Care Health Dev*  
7 556 2013;39(5):722-7.  
8 557 37. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al. Changes  
9 558 in lipidemia during chronic care treatment of childhood obesity. *Child Obes*  
10 559 2012;8(6):533-41.  
11 560 38. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb musculoskeletal  
12 561 health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.  
13 562 39. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et al.  
14 563 Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr*  
15 564 2008;152(4):489-93.  
16 565 40. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J*  
17 566 *Public Health* 2010;100(6):1019-28.  
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19  
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570 Table 1. Descriptive statistics of the sample

	Child (n=16)	Parent (n=22)	Grandparent (n=27)
Age (mean in years, range)	4.6 (3.1-5.7)	32.2 (22.7-49.5)	56.9 (43.0-77.9)
Gender:			
Female	8 (50%)	14 (64%)	21 (78%)
Male	8 (50%)	8 (36%)	6 (22%)
Racial background:			
Euro-American/Caucasian	11 (68%)	21 (95%)	23 (84%)
Native American	0	1 (5%)	0
Asian	0	0	1 (4%)
African-American	0	0	1 (4%)
Mixed	5 (32%)	0	2 (8%)
BMI (mean, range)	17.7 (14.3-21.5)	26.8 (16.1-39.1)	29.1 (16.1-49.4)
Weight status:			
Underweight	0	2 (9%)	1 (3%)
Normalweight	7 (44%)	8 (36%)	8 (30%)
Overweight	4 (25%)	6 (27%)	10 (37%)
Obese	5 (31%)	6 (27%)	8 (30%)
Highest school grade completed	n/a		
High school		8 (82%)	20 (74%)
College/University		4 (18%)	7 (26%)
Working situation	n/a		
Full time		7 (32%)	8 (30%)
Part time		4 (18%)	4 (15%)

Not employed*		11 (50%)	15 (55%)
Annual household income	n/a		
Less than 14,999 USD		8 (36%)	7 (26%)
15,000-24,999 USD		6 (27%)	6 (22 %)
25,000 – 39,999 USD		4 (18%)	6 (22 %)
More than 40, 000 USD		4 (18%)	8 (30 %)

571 \* The main reasons for unemployment among parents were child care, pursuing higher  
 572 education, and not finding work; among grandparents, unemployment was due to not finding  
 573 work, reaching retirement age,, or retiring due to health issues.

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576 Table 2. Examples of participants' quotes on perceptions of young children's body sizes.

577 Table Legends: Gp# - family group number; P - parent; G – grandparent.

578 \* = parent/grandparent of child with normal weight

579 \*\* = parent/grandparent of child with overweight

580 \*\*\* = parent/grandparent of child with obesity

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<b><i>Theme 1: Young children are 'pudgy' or 'big for their age', but not obese</i></b>	
1.1 Gp03P2 (Father) ***:	Yeah, I think personally, my son is a little on the heavy side. (... )But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.
1.3 Gp11G1 (Mother's mother) ***:	[My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.
1.6 Gp01P1 (Father) ***:	but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.
1.14 Gp11G1 (Mother's mother) ***:	She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never been concerned about her weight.
<b><i>Theme 2: 'Baby fat' is cute and healthy</i></b>	
2.2 Gp05P2 (Father) *:	I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.
2.10 Gp11P1 (Mother) ***:	Well we kind of joke about it because my daughter's kind of got the little girl gut.
2.11 Gp01G1 (Mother's mother) ***:	she does have cute little love handles.
2.12 Gp10P1 (Mother) **:	I just think chubbier kids are cuter. So I try to keep him a little chubby.
<b><i>Theme 3: Children go through 'growth spurts' and 'stretching out'</i></b>	
3.2 Gp01P1 (Mother) ***:	But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.
3.3 Gp02G1 (Father's mother) ***:	My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.
3.7 Gp03P2 (Father) ***:	by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

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584 Table 3. Examples of participants' quotes on perceptions of the timeline of obesity.

585 Table Legends: Gp# - family group number; P - parent; G – grandparent.

586 \* = parent/grandparent of child with normal weight

587 \*\* = parent/grandparent of child with overweight

588 \*\*\* = parent/grandparent of child with obesity

589

***Theme 4: A high body weight becomes problematic later in childhood***

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

***Theme 6: Obesity becomes problematic in adulthood***

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole

life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

590

591 Table 4. Examples of participants' quotes on perceptions of parental responsibility and blame  
592 for childhood obesity.

593 Table Legends: Gp# - family group number; P - parent; G – grandparent.

594 \* = parent/grandparent of child with normal weight

595 \*\* = parent/grandparent of child with overweight

596 \*\*\* = parent/grandparent of child with obesity

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***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

***Theme 8: The parents of obese children are blamed by themselves and by others***

8.1 Gp042 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.

598

599 Table 5. Examples of participants' quotes on perceptions of appropriate contexts for speaking  
600 about preschoolers' body weights.

601 Table Legends: Gp# - family group number; P - parent; G – grandparent.

- 1  
2  
3 602 \* = parent/grandparent of child with normal weight  
4 603 \*\* = parent/grandparent of child with overweight  
5 604 \*\*\* = parent/grandparent of child with obesity  
6 605

7  
8 ***Theme 9: Parents and grandparents discuss preschoolers' body weights with them only when the children raise the topic***

9  
10  
11 9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she  
12 knows she weighs more than her brother but we've never, I've always told her, "Look at me,  
13 I'm fat, you're not fat".

14  
15 9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few  
16 weeks ago he talked about being fat, and I don't know where he got that from, like another  
17 kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a  
18 surface level.

19  
20 9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than  
21 anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm  
22 bigger, I'm still only five years old".

23  
24 ***Theme 10: It's acceptable to discuss how big or strong preschoolers are.***

25  
26 10.2 Gp12G3 (Father's mother) \*\*\*: We talk about how fit he is. He's a very fit child.

27  
28 10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, "Yeah, look at his  
29 muscles".

30  
31 10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always  
32 showing their muscles and stuff like that. We encourage them to eat their veggies so then they  
33 can get big muscles and then they want to show off their muscles.

34  
35 ***Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively***

36  
37 11.2 Gp03P2 (Father) \*\*\*: By far I don't think that parents should focus on it [weight]  
38 because then it will become a focal point for the child.

39  
40 11.3 Gp01G1 (Father's mother) \*\*\*: I wouldn't sit with an iron fist and say, "You can't have  
41 that because it will make you fat." Because that affects their mental (wellbeing).

42  
43 11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their  
44 weight in some ways. Especially when it's just a healthy thing. I think it's best to not say  
45 anything.

46  
47 11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too  
48 much because I do think that girls get set up in this world to worry a lot about that and that it  
49 could lead to some problems.

50  
51 ***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

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2  
3 12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a  
4 bit, personally, but I don't know because I haven't asked her.  
5

6 12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the  
7 parents] – I am not sure they consider it an issue yet.  
8

9 12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that  
10 because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.  
11

12 12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's  
13 weight]. (*Interviewer: Not with [her husband]?*) Um, [my daughter] and I have a closer, more  
14 intimate [connection], like [we can] talk about that kind of thing.  
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**When Does Obesity Become a Problem? "A little on the heavy side": A Qualitative Analysis of Parents' and Grandparents' Perceptions of Preschoolers' Body Weights**

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**Abstract**

**OBJECTIVES:** Parents' difficulties in perceiving children's weight status accurately pose a barrier for family-based obesity interventions; however, the factors underlying weight misinterpretation still need to be identified. This study's objective was to examine ~~mothers', fathers', parents~~ and grandparents' perceptions of preschoolers' body sizes. Interview questions ~~emphasized also explored~~ perceptions of ~~overweight and obesity from a life-course perspective~~, parental responsibility, ~~for childhood obesity~~ and appropriate contexts in which to discuss preschoolers' weights.

**DESIGN:** Semi-structured interviews, which were videotaped, transcribed, and analyzed qualitatively.

**SETTING:** Eugene and the Springfield metropolitan area, Oregon, USA

**PARTICIPANTS:** Families of children aged 3-5 years were recruited in February – May 2011 through advertisements about the study, published in the job seekers' sections of Craigslist and local newspapers. 49 participants (22 parents and 27 grandparents, 70% women, 60% with overweight/obesity) from sixteen low-income families of children aged 3-5 years (50% girls, 56% with overweight/obesity) were interviewed.

**RESULTS:** There are important gaps between clinical definitions and lay perceptions of childhood obesity. While parents and grandparents were aware of their preschoolers' growth chart percentiles, these measures did not translate into recognition of children's overweight or obesity. The participants spoke of obesity as a problem that may affect the children in the future, but not at present. Participants identified childhood obesity as being transmitted from one generation to the next, and stigmatized it as resulting from 'lazy' parenting. Parents and grandparents avoided discussing the children's weights with each other and with the children themselves.

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**CONCLUSIONS:** The results suggest that clinicians should clearly communicate with parents and grandparents about the meaning and appearance of obesity in early childhood, as well as counteract the social stigma attached to obesity, in order to improve the effectiveness of family-based interventions to manage obesity in early childhood.

For peer review only

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### 51 Strengths and limitations of this study

- 52 • This study's sample is the largest ever reported in a qualitative investigation of family  
53 members' perceptions of preschoolers' body weights.
- 54 • While most previous studies focused only on mothers' perceptions of their  
55 preschoolers' body weights, this study included mothers, fathers, grandmothers, and  
56 grandfathers, recognizing that various adult family members influence young  
57 children's body image, eating, and exercise habits.
- 58 • Although low-income participants tend to be difficult to reach, the study successfully  
59 recruited a predominantly low-income sample.
- 60 • The sample primarily consisted of families of Caucasian origin, and thus did not allow  
61 for an investigation of the influence of cultural background on perceptions of  
62 children's body sizes.
- 63 • As several participants were single mothers, the number of fathers was not high  
64 enough to enable an assessment of potential differences between fathers' and mothers'  
65 perceptions.  
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## 68 INTRODUCTION

69  
70 While there is growing evidence of the superior effectiveness of lifestyle interventions  
71 initiated early in childhood<sup>1-3</sup>, one of the main barriers in conducting such interventions is  
72 parents' lack of recognition of, or concern about, obesity in children. Parents' difficulties in  
73 perceiving children's body sizes accurately have been demonstrated since the early 2000s,  
74 across many countries, cultures and child ages<sup>4-6</sup>. A recent study of over 16,000 children aged  
75 2-9 years from eight European countries has shown that, among parents of overweight  
76 children, 63% perceived their children's weights as 'proper', independent of educational  
77 level<sup>7</sup>. Moreover, a meta-analysis of 69 studies on parental perceptions of children's body  
78 weights showed that half of the parents underestimated their children's weightsweight.<sup>8</sup>

79  
80 Most studies have applied a quantitative approach to describe parents' miscategorization of  
81 children's weight status; however, the underlying factors have not been identified  
82 conclusively<sup>6</sup>. To date, only two studies<sup>9 10</sup> have used in-depth interviews to examine how  
83 parents make sense of children's body weights and their health implications. In their study of  
84 low income mothers, Jain et al have shown that most mothers did not worry about their  
85 children's body weights if the children were active and socially accepted; the mothers,  
86 howevermoreover, distrusted pediatric growth charts, and attributed childhood obesity to  
87 genetics, rather than to factors modifiable in the home environment.<sup>9</sup> Misinterpretation of  
88 growth charts was also highlighted by Rich et al, who found that 80% of parents perceived  
89 their child as healthy although the child's weight was at the 95<sup>th</sup> percentile. These parents,  
90 notably, were aware of obesity related health risks<sup>10</sup>. More recently, focus groups revealed  
91 that, in assessing their children's body sizes, parents tend not to rely on clinical  
92 measurements; rather, they often compare their children visually to other children whose body

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93 sizes can be defined as extreme, thus skewing their perceptions of what a healthy body size  
94 is<sup>11</sup>.

95  
96 So far, existing research on parental perceptions of children's body weights has focused  
97 almost exclusively on mothers, and has not ~~acknowledging~~ examined the critical influence of  
98 other family members, such as fathers and grandparents<sup>12</sup>. Because family-based  
99 interventions have been proposed as the most effective approach to treating child obesity<sup>13 14</sup>,  
100 knowledge about how other adult caretakers perceive and discuss young children's body  
101 weights will contribute to understanding familial barriers to treatment. Moreover, the  
102 fostering of sensitive and non-judgmental communication about children's eating practices  
103 and body sizes is important for the prevention of body dissatisfaction and disordered eating in  
104 childhood and adolescence<sup>15 16</sup>. To examine caretakers' perceptions of young children's body  
105 weights from a broader familial perspective, we designed this study to include family sets of  
106 ~~mothers, fathers, parents~~ and grandparents actively involved in taking care of preschool age  
107 children. This study was part of a larger research project, whose overall aim was to evaluate  
108 the role of grandparents in the development of preschoolers' lifestyle early in life. The larger  
109 research project yielded rich material on the participants' perceptions of young children's  
110 body weights, and we found this topic merited dedicated discussion apart from the larger  
111 study.

112 As childhood obesity remains high among families with low socioeconomic status<sup>+5-1717-19</sup>,  
113 and as it is more difficult to recruit and retain these families in intervention programs<sup>+8-1920,21</sup>,  
114 we chose to target a low income population.

## 116 METHODS

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7 118 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield  
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9 119 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements  
10  
11 120 about the study, published in a local newspaper and the volunteers' and job seekers' sections  
12  
13 121 of Craigslist ~~and local newspapers. The study's main research aim was to evaluate (the role of~~  
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15 122 ~~grandparents most widely used classified advertisement website in the development of~~  
16  
17 123 ~~preschoolers' lifestyles early in life, such that the United States). The~~ active involvement of  
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19 124 grandparents in family life (defined as spending time with the grandchild at least twice a  
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21 125 month) was the primary criterion for inclusion in the study. Consequently, only families in  
22  
23 126 which at least one parent and one grandparent were willing to be interviewed were included in  
24  
25 127 the study. The other inclusion criteria specified that the child's age must be between 3-5  
26  
27 128 years, and that the child should have no underlying medical condition or disability which  
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29 129 would affect his/her weight. ~~The study was approved by the Internal Review Board of the~~  
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31 130 ~~Oregon Social Learning Center~~ All families who contacted the study coordinator and were  
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33 131 found to fulfill the inclusion criteria were recruited to the study. The study was approved by  
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35 132 the Internal Review Board of the Oregon Social Learning Center. When the participants first  
36  
37 133 met with the researchers, and before the interviews took place, the researchers verbally  
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39 134 explained the informed consent forms to each participant, and answered any questions  
40  
41 135 participants had. If the parents/grandparents agreed to participate, they were asked to read  
42  
43 136 and sign the written project description and project consent forms. The families received a  
44  
45 137 copy of the written study description and informed consent forms.

46  
47 139 ~~In total, 49 family members (70% female) from sixteen families were interviewed.~~  
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49 140 ~~Participants' characteristics are summarized in Table 1. Due to the targeted recruitment~~  
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51 141 ~~process (ads in job advertisement sections) the sample displayed low levels of education and~~  
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53 142 ~~income, as many as 50% of parents were unemployed. Moreover, more than half of parents~~

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7 143 and two thirds of grandparents had overweight or obesity, according to WHO criteria<sup>20</sup>. Of the  
8 144 children, 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile  $\leq$  BMI  $<$  95<sup>th</sup>  
9 145 percentile; obesity: BMI  $\geq$  95<sup>th</sup> percentile)<sup>21-23</sup>; those five who were categorized as obese  
10 146 were in the 95<sup>th</sup>, 96<sup>th</sup>, 98<sup>th</sup> (two children) and 99<sup>th</sup> percentiles for their BMI. The majority of  
11 147 children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this  
12 148 region of the Pacific Northwest.  
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20 150 *Insert Table 1 here.*  
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24 152 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.  
25  
26 153 Free child care was provided on site, and the children were not present during the interviews.  
27  
28 154 Each interviewed participant received compensation of \$50 for participating in the study.  
29  
30 155 Prior to the interview, parents and grandparents completed a comprehensive  
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32 156 sociodemographic questionnaire- routinely used in research projects involving families at the  
33 157 Oregon Social Learning Center; the questionnaire included items concerning family  
34 158 composition, parental education, employment status, and living conditions. All the  
35  
36 159 interviewed parents and grandparents as well as the preschooler in focus had their height and  
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38 160 weight measured, without shoes and wearing only light clothing, by trained research staff  
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40 161 prior to the interviews. The weight status using height and weight was not calculated prior the  
41 162 interview, thus the interviewer and the family members were not informed about the child's or  
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43 163 family members' weight status. The interviews, which were conducted by a single researcher  
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45 164 (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of  
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47 165 family members in shaping a child's lifestyle. Before coding, all participant names were  
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49 166 changed to ensure confidentiality.  
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7 168 This paper focuses on the parents' and grandparents' perceptions of young children's body  
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9 169 weights, with particular emphasis on overweight and obesity ~~from a life course perspective,~~  
10 170 parental responsibility for childhood obesity, and contexts in which parents and grandparents  
11  
12 171 discuss preschoolers' body weights. The main questions were: (1) Do you think that how  
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14 172 much a child weighs matters? If yes, why? If not, why? (2) How much do you think that a  
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16 173 child's weight is possible to control/controllable? If yes, what lifestyle choices do you think  
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18 174 are the most important? How/when do you think they can be promoted, and who do you think  
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20 175 can do that? And who in the family plays the most important role when it comes to  
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22 176 influencing the child's weight? If no, what makes you think that way? (3) What do you think  
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24 177 about your child's (or grandchild's) weight? As compared to his/her siblings, cousins, other  
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26 178 children, to the child's parents. Are you concerned/not concerned? (4) What do you think that  
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28 179 the parents of your grandchild think about your grandchild's weight (or grandparents of your  
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30 180 child about your child's weight)? Examine: If there are two parents (grandparents) in the  
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32 181 house, do they have the same opinion? (5) Do you talk about your child (grandchild's) weight  
33  
34 182 with his/her grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two  
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36 183 parents in the house, which of them do you talk the most with and why? (6) Do you know if  
37  
38 184 your child (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it?  
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40 185 Did that happen in your presence? If yes, what did you say? If your child doesn't think about  
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42 186 his/her weight, is it good or bad?

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45 188 It should be noted that while all participants were asked the same main questions, the  
46  
47 189 interview process allowed for fluidity, and follow-up questions were adapted according to  
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49 190 each participant's responses. Additionally, while the majority of data directly refer to the main  
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51 191 questions listed, the present analysis includes pertinent comments the participants made  
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53 192 throughout the interviews. The interviews were videotaped and transcribed in full;  
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7 193 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this  
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9 194 paper, transcript sections that related to the main questions were extracted and collated. The  
10  
11 195 transcripts were then coded independently by the first and the last author, using a thematic  
12  
13 196 discourse analysis approach. Discourse analysis is concerned with people's use of language to  
14  
15 197 describe and make sense of their realities, and is an appropriate approach for qualitative  
16  
17 198 studies that examine people's definitions of and spoken attitudes towards health issues<sup>24, 22</sup>.  
18  
19 199 Thematic analysis facilitates the identification of patterns in qualitative data, and therefore  
20  
21 200 allowed the researchers to delineate themes across the data set<sup>23</sup>. Over several in-person  
22  
23 201 meetings and email correspondence, the two coders compared and discussed their codes, to  
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25 202 examine and resolve potential disagreements, and reach consensus on the clustering of codes  
26  
27 203 into themes and on the grouping of themes under thematic categories.  
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## 205 RESULTS

30  
31 206 In total, 49 family members (70% female) from sixteen families were interviewed. The  
32  
33 207 sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation  
34  
35 208 <sup>24</sup>. Seven families consisted of single parent with sole responsibility for the child (five single  
36  
37 209 mothers and two single fathers). In ten families, only one grandparent was interviewed; in two  
38  
39 210 families, two grandparents were interviewed; in three families, three grandparents were  
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41 211 interviewed; and in one family, four grandparents were interviewed. In five of the families, all  
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43 212 grandparents who had contact with the grandchild were interviewed. The most common  
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45 213 reason for not being able to include full sets were the other grandparents' residing outside the  
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47 214 study area.

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51 216 Participants' characteristics are summarized in Table 1. All data refer to parents and  
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53 217 grandparents who were interviewed as part of the study. Due to the targeted recruitment  
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7 218 process (ads in job advertisement sections) the sample displayed low levels of education and  
8 219 income; as many as 50% of parents were unemployed. The majority of children, parents and  
9 220 grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific  
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11 221 Northwest.  
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16 223 All the interviewed parents and grandparents as well as the preschooler in focus had their  
17 224 height and weight measured, without shoes and wearing only light clothing, by trained  
18 225 research staff prior to the interviews. These measurements were taken in order to  
19 226 contextualize the participants' stated perceptions of and attitudes toward childhood  
20 227 overweight/obesity and associated lifestyle factors. The participants' and the children's BMI  
21 228 statuses were not calculated prior to the interviews, so as not to bias the interview process.  
22 229 Thus, the interviewers and the participants were not informed about the child's or any of the  
23 230 adult family members' weight status. More than half of parents and two thirds of grandparents  
24 231 had overweight or obesity, according to World Health Organization criteria<sup>25</sup>. Of the children,  
25 232 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile < Body Mass Index (BMI)  
26 233 < 95th percentile; obesity: BMI ≥ 95th percentile)<sup>26-28</sup>, those five who were categorized as  
27 234 obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.  
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41 236 Insert Table 1 here.  
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45 238 The analysis yielded twelve major themes, clustered under four thematic categories:  
46  
47 239 Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions  
48 240 of parental responsibility and blame for childhood obesity, and perceptions of appropriate  
49 241 contexts for speaking about preschoolers' body weights. While the number of fathers was not  
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51 242 high enough to enable an assessment of differences between fathers' and mothers' perceptions  
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243 and attitudes, it is possible to say that the participants' responses were consistent across the  
244 sample, and no generational differences were observed between the parents' and the  
245 grandparents' perceptions of their preschoolers' body sizes. Examples of participant quotes  
246 from each of the thematic categories and their constituent themes are presented in table format  
247 (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental  
248 material ([Supplementary Tables 1-4](#)).

250 *Insert Tables 2-5 here.*

### 253 **Perceptions of young children's body sizes (Table 2)**

254 None of the participants used the words 'obese' or 'overweight' to describe the preschoolers  
255 whom the growth charts defined as such. The participants used a range of words to describe  
256 the body sizes of these preschoolers, including 'pudgy', 'chunky', 'solid', 'stout', 'chubby',  
257 'stocky', 'big boned', and 'robust'. Several participants described the preschoolers as 'tall'  
258 and/or 'big for their age'. Notably, even the father of the heaviest child in the sample (99<sup>th</sup>  
259 percentile) described his child as 'a little on the heavy side'. Across the sample, including the  
260 parents and grandparents of normal weight children, the participants spoke of 'baby fat' as  
261 cute and healthy, and even as something to encourage. A few participants also spoke of  
262 children's higher percentiles on the growth charts (>90<sup>th</sup> percentile) in positive terms. The  
263 parents and grandparents of the overweight or obese preschoolers said their body weight was  
264 not worrisome because children go through 'growth spurts' and 'stretch out', such that their  
265 current excess weight will eventually convert into height.

### 267 **Perceptions of the timeline of obesity (Table 3)**

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6 268 The participants spoke of obesity as a problem that may affect the preschoolers in the future,  
7  
8 269 but not at present. Several participants indicated that a high body weight becomes problematic  
9  
10 270 when the child reaches school age, particularly due to the risk of teasing, social exclusion, and  
11  
12 271 bullying. Participants also said that a high body weight becomes problematic when it  
13  
14 272 negatively affects the child's health, activities, behaviors, or mood. However, only one  
15  
16 273 participant, whose child was in the 99<sup>th</sup> percentile for weight, said that she could notice the  
17  
18 274 detrimental effects of the child's body weight at present. Thus, even when speaking of obesity  
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20 275 in terms of impact on activity and health, the participants placed it outside the remit of the  
21  
22 276 preschoolers' current experience. Participants also spoke of obesity as problematic due to its  
23  
24 277 manifestations in adulthood, expressing that children's body weights and their eating and  
25  
26 278 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing]  
27  
28 279 more trouble as an adult'.  
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30 280

#### 31 281 **Perceptions of parental responsibility and blame for childhood obesity (Table 4)**

32 282 The participants identified parents as bearing primary responsibility for their children's eating  
33  
34 283 and exercise habits and for their body weights. Even those participants who spoke of body  
35  
36 284 size as being affected by genetics asserted that parents can still influence their children's body  
37  
38 285 weights. Likewise, participants who mentioned that children may be overweight or obese due  
39  
40 286 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making  
41  
42 287 sure the child's medical problem is identified and resolved. The participants argued that  
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44 288 parents are responsible for children's body weights because they can control what their  
45  
46 289 children eat, provide a healthy food environment at home, encourage their children to play  
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48 290 outside and be active, and model healthy behaviors themselves.  
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7 292 The participants' concepts of parental responsibility linked with their attitudes towards  
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9 293 parental blame for childhood obesity. Several participants said they 'judged' parents whose  
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11 294 children were obese; some even said that the parents of obese children were guilty of child  
12  
13 295 neglect or abuse. Participants identified childhood obesity as being transmitted from one  
14  
15 296 generation to the next, and as the result of 'lazy' parenting. Having an obese child was an  
16  
17 297 outward sign of 'failing' as a parent, and one mother whose child was obese spoke of feeling  
18  
19 298 blamed by clinicians for the child's ~~unexplained weight gain~~ weight gain, which, as she said,  
20  
21 299 neither she nor the child's clinicians could explain.  
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### 28 303 **Perceptions of appropriate contexts for speaking about preschoolers' body weights**

#### 29 304 **(Table 5)**

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31 305 The participants described discussions of preschoolers' body weights as sensitive, often  
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33 306 unnecessary, and potentially dangerous. The decision to engage in discussion about children's  
34  
35 307 body weights was context dependent. Participants said they discussed their children's or  
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37 308 grandchildren's body weights with them only if the children themselves raised the topic.  
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39 309 Those participants whose preschoolers did not mention body weight said they had never  
40  
41 310 discussed the issue with them. Several participants said that children of preschool age do not  
42  
43 311 have body image concepts related to weight, ~~and some~~. Some participants cited their  
44  
45 312 preschoolers' ~~'comfortable' behaviors~~ apparent 'comfort' with – or lack of self-consciousness  
46  
47 313 about – their bodies as signaling a lack of concern with body image. A number of participants  
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49 314 also said they avoided discussions of their preschoolers' body weights because these  
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51 315 discussions could be harmful to the children's self-esteem and emotional wellbeing.  
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7 317 | ~~Notably,~~ Notably, excepting the parents of the two children with the height weight statuses, all  
8 318 | parents avoided discussing their children's body weights not only with the children  
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10 319 | themselves, but also with the children's grandparents; likewise, excepting one grandmother,  
11 320 | all grandparents avoided discussing their grandchildren's body weights with the parents.  
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14 321 | Participants described these discussions as unnecessary when body weight was 'not an issue'.  
15  
16 322 | It was only when a child's body weight was perceived as problematic (in the case of the  
17  
18 323 | largest child in the sample) that parents and grandparents said they openly discussed it with  
19  
20 324 | each other. However, while most participants said they did not discuss body weights, they  
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22 325 | identified comments on children's 'healthy' appearance, growth, or muscle definition as  
23  
24 326 | appropriate and positive. Thus, although participants were reluctant to discuss the  
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26 327 | preschoolers' body weights, they did discuss the preschoolers' body sizes, with attention to  
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28 328 | how 'big' or 'strong' they were.

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## 331 **DISCUSSION**

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333 This study's findings suggest that the parents and grandparents of preschool age children face  
334 difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous  
335 research has found that low income mothers are not concerned about preschoolers'  
336 overweight because they attribute body weight to genetic heredity<sup>9</sup>. However, in this study,  
337 the participants strongly endorsed the idea that parents bear primary responsibility for their  
338 children's eating and exercise habits and body weights. Nevertheless, the participants did not  
339 speak of their own children or grandchildren as overweight or obese. Notably, the  
340 participants' responses were consistent across the sample, and no generational differences

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341 were observed between the parents' and the grandparents' perceptions of their preschoolers'  
342 body sizes.

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344 Although the participants recognized obesity in general as a problem, they normalized their  
345 own children's and grandchildren's excess body weight as 'toddler pudge' or 'cute baby fat'.

346 Like Jain et al<sup>9</sup>, the authors of the present study suggest that ~~the most~~ participants used these  
347 words not as euphemisms. ~~The, as underscored by the~~ participants' consistent descriptions of  
348 children's higher body weights in positive terms – as 'cute' or 'healthy' – ~~underscore the~~  
349 ~~invisibility of preschoolers' obesity among lay persons.~~ While participants said that

350 preschoolers' body weights would be problematic if the child became 'visibly overweight', it

351 was ~~unclear~~ clear how a 'visibly overweight' preschooler might look. The participants'  
352 discussions focused, instead, on signs that might negate 'visible overweight' in a preschooler,

353 including tallness, muscularity, and physical strength. As noted by Jones et al<sup>11</sup>, when

354 participants described obesity, it was through extreme cases of morbid obesity in later

355 childhood or adulthood, ~~such as with some citing examples of~~ older children who were

356 'miniatures of their parents' and contestants on *The Biggest Loser* who weighed 400 lbs.

357 Future research should explore how a 'visibly overweight' preschooler might look to parents  
358 and grandparents.

359  
360 Just as the participants visualized obesity through images of older children or adults, they also

361 spoke of obesity as a problem that might affect children later in life, but not in preschool age.

362 Participants spoke of suffering from teasing as a school age child, or from poor health as an

363 adult, as the consequences that marked obesity as a problem. While participants did say that

364 they would recognize a body weight problem if their preschoolers showed negative changes in

365 behavior, activity, and mood, they did not name immediate health risks. The participants'

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7 366 depictions of obesity revealed a disconnect between knowledge and perception, previously  
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9 367 shown by Rich et al<sup>10</sup>. Although they were aware of their preschoolers' growth chart  
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11 368 percentiles, most participants did not link these percentiles with the categories of 'overweight'  
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13 369 and 'obesity'. Likewise, although participants were aware of the health risks associated with  
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15 370 obesity in adulthood, they did not link their preschoolers' body weights with potential  
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17 371 problems in the present tense.  
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20 373 While the participants did not associate obesity with early childhood, they did take  
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22 374 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise  
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24 375 practices. Along similar lines, however, the participants – including some whose children  
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26 376 were classified as obese –blamed parents for childhood obesity. The participants' expressions  
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28 377 of judgment toward the parents of obese children were aligned with broader social stigma  
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30 378 attached to obesity<sup>25-26,29,30</sup>. Given the participants' stigmatizing attitudes, it is not surprising  
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32 379 that they did not discuss their preschoolers' body weights with other family members.

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34 380 Although parents and grandparents did discuss children's body sizes through comments on  
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36 381 how 'big', 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers  
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38 382 were classified as overweight or obese did not discuss their body weights with family  
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40 383 members, except when there was a perceived health problem. It is possible that, for the  
41  
42 384 participants, discussion of body weight threatened to expose both themselves and their  
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44 385 children to the risk of blame, reduced self-esteem, and stigma attached to obesity. At the  
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46 386 same time, it is important to note that, in deciding not to discuss body weight with their  
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48 387 preschoolers (unless the children themselves raised the topic), the participants protected the  
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50 388 children's body image and self-esteem. ~~Moreover, like the parents described by Andreassen et~~  
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52 389 ~~at~~<sup>27</sup> Moreover, like the parents described by Andreassen et al<sup>31</sup>, those parents who recognized  
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54 390 their children needed to lose weight attempted to enact weight loss strategies without  
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391 explicitly mentioning weight. As previous studies have shown, parental comments about body  
392 weight are associated with body dissatisfaction and reduced self-esteem<sup>28-30,15,32,33</sup>,  
393 such that the participants' stance on avoiding 'weight talk' with children was positive and  
394 should be encouraged. A recent study has proposed a set of guidelines to help parents discuss  
395 body image and eating with preschool aged children in a supportive way that is protective of  
396 children's self-esteem<sup>16</sup>.

397  
398 The results of this study suggest that there are important gaps between clinical definitions and  
399 lay perceptions of childhood obesity. While parents and grandparents are aware of their  
400 preschoolers' growth chart percentiles, these measures do not translate into recognition of  
401 young children's overweight or obesity. Without visual examples of how a preschool age  
402 child with overweight or obesity might look, such as sketched silhouettes or photographs at  
403 different weight categories<sup>31-33,34-36</sup>, parents and grandparents continue to speak of children's  
404 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later  
405 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss  
406 young children's body weights with the children and with one another, this might affect the  
407 success of clinical interventions for childhood obesity, in which children's caretakers are  
408 forced into a new and uncomfortable discussion.

409  
410 The clinical implications of this study include several components. In discussions with parents  
411 and grandparents of preschool age children, clinicians should clarify how children's fat  
412 distribution and body sizes typically change with age. Clinicians should also speak with  
413 children's caretakers about the meaning of growth chart percentiles, and provide visual  
414 examples of how children might look in each of the percentile categories. Moreover,  
415 clinicians should emphasize the immediate problems associated with obesity in early

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7 416 childhood, such as hypertension (present ~~at~~<sup>in</sup> more than 50% of children with obesity),  
8 417 dyslipidemia, motor skill development and orthopedic complications<sup>34-3637-39</sup>.

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12 419 The results also suggest that the countering of stigma should be an important part of the  
13 420 clinical management of childhood obesity. Given the social stigma and blame attached to  
14 421 parents of children with obesity, parents might contest a child's obesity diagnosis and be  
15  
16 422 reluctant to take part in interventions to manage their child's condition<sup>37,40</sup>. It is therefore  
17  
18 423 crucial that clinicians directly address stigma when they speak to parents, emphasizing that  
19  
20 424 childhood obesity is not the parents' fault, and that managing this condition together is a  
21  
22 425 positive step. Similarly, clinicians should avoid addressing parents of children with obesity in  
23  
24 426 ways that might make them feel guilty or judged. Finally, it is important that clinicians frame  
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26 427 discussions of children's body weights sensitively, and encourage parents and grandparents to  
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28 428 address children's eating and physical activity practices through positive words and actions,  
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30 429 without emphasizing body weight to the children themselves.

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35 431 This study had some limitations. While the sample was the largest ever reported in a  
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37 432 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning  
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39 433 preschoolers' body weights, the ~~children themselves were not interviewed. Moreover, the~~  
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41 434 ~~sample primarily consisted of families~~<sup>families were mainly</sup> of Caucasian origin, representing  
42  
43 435 the ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the  
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45 436 influence of cultural background on perceptions of children's body sizes, which several  
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47 437 studies have identified as important<sup>5+1618 2630</sup>, could not be investigated. As the study targeted  
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49 438 families of low socioeconomic status, further research is needed to determine whether the  
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51 439 results can be generalized to other populations. Additionally, as several participants were  
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53 440 single mothers, the number of fathers was not high enough to enable an assessment of  
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441 differences between fathers' and mothers' perceptions and attitudes. Finally, while a number  
442 of families had a full or nearly-full set of grandparents participating, some had only one or  
443 two grandparents participating, due to circumstances such as the other grandparents' living  
444 outside the area.

445

## 446 CONCLUSION

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448 This study was the first to focus on both parents' and grandparents' perceptions of  
449 preschoolers' body weights, and is the largest qualitative study to date to include a mixed  
450 familial sample of adult caretakers of preschool age children. The study's results demonstrate  
451 that while parents and grandparents recognize childhood obesity as problematic, endorse  
452 healthy eating and exercise habits, and take responsibility for children's body weights, they  
453 find it difficult to recognize and discuss young children's overweight and obesity. The results  
454 suggest that clinicians should clearly communicate with parents and grandparents about the  
455 meaning and appearance of obesity in early childhood, as well as counteract the social stigma  
456 attached to obesity, in order to improve the effectiveness of family-based interventions to  
457 manage obesity in early childhood.

458

## 459 ACKNOWLEDGMENTS

460 We thank all the participating families ~~and, as well as~~ Eliah Prichard, Jessica Farmer, Kelly  
461 Underwood, Bryn Shepherd and Waihan Leung, the ~~students from the~~ University of Oregon  
462 students who transcribed the interviews.

463

464

## 465 CONTRIBUTORSHIP STATEMENT

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466 Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote  
467 the manuscript, and approved the final manuscript as submitted.

468 Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the  
469 manuscript, and approved the final manuscript as submitted.

470 Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed  
471 the manuscript and approved the final manuscript as submitted.

472 Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and  
473 supervised data collection and analysis, coded the interviews and analyzed them together with  
474 Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.

475

#### 476 **COMPETING INTERESTS**

477 We have read and understood BMJ policy on declaration of interests and declare that we have  
478 no competing interests.

479

#### 480 **FUNDING**

481 This work was supported by grants to PN from the Sweden-America Foundation, the Oregon  
482 Social Learning Center and the Marie Curie VINNMER International Qualification (2011-  
483 03443).

484

#### 485 **DATA SHARING**

486 Online supplementary table S6-9 containing complete sets of pertinent participant quotes. No  
487 additional data available.

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## 491 REFERENCES

- 492 | 1. — Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al.  
 493 | Interventions for preventing obesity in children. *Cochrane Database Syst Rev*  
 494 | 2011;12:CD001871.
- 495 | 2. — Reinehr T, Kleber M, Lass N, Toschke AM. Body mass index patterns over 5 y in  
 496 | obese children motivated to participate in a 1-y lifestyle intervention: age as a  
 497 | predictor of long-term success. *Am J Clin Nutr* 2010;91(5):1165-71.
- 498 | 3. — Danielsson P, Svensson V, Kowalski J, Nyberg G, Ekblom O, Marcus C. Importance  
 499 | of age for 3-year continuous behavioral obesity treatment success and dropout rate.  
 500 | *Obes Facts* 2012;5(1):34-44.
- 501 | 4. — Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual  
 502 | weight status of children: a metasynthesis of the current research. *J Am Acad Nurse*  
 503 | *Pract* 2009;21(3):160-6.
- 504 | 5. — Parry LL, Netuveli G, Parry J, Saxena S. A systematic review of parental perception  
 505 | of overweight status in children. *J Ambul Care Manage* 2008;31(3):253-68.
- 506 | 6. — Towns N, D'Auria J. Parental perceptions of their child's overweight: an integrative  
 507 | review of the literature. *J Pediatr Nurs* 2009;24(2):115-30.
- 508 | 7. — Regber S, Novak M, Eiben G, Bammann K, De Henauw S, Fernandez-Alvira JM, et  
 509 | al. Parental perceptions of and concerns about child's body weight in eight European  
 510 | countries--the IDEFICS study. *Pediatr Obes* 2013;8(2):118-29.
- 511 | 8. — Lundahl A, Kidwell KM, Nelson TD. Parental underestimates of child weight: a  
 512 | meta-analysis. *Pediatrics* 2014;133(3):e689-703.
- 513 | 9. — Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't  
 514 | low-income mothers worry about their preschoolers being overweight? *Pediatrics*  
 515 | 2001;107(5):1138-46.
- 516 | 10. — Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions  
 517 | of health status and play activities in parents of overweight Hispanic toddlers and  
 518 | preschoolers. *Fam Community Health* 2005;28(2):130-41.
- 519 | 11. — Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ.  
 520 | Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int*  
 521 | *J Obes (Lond)* 2011;35(7):953-62.
- 522 | 12. — Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding  
 523 | healthy behaviours for preventing overweight and obesity in young children: a  
 524 | systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
- 525 | 13. — Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al.  
 526 | Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
 527 | 2009(1):CD001872.
- 528 | 14. — Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of  
 529 | Nutrition and Dietetics: interventions for the prevention and treatment of pediatric  
 530 | overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
- 531 | 15. — [Smolak L, Levine MP, Schermer F. Parental input and weight concerns among](#)  
 532 | [elementary school children. \*Int J Eat Disord\* 1999;25\(3\):263-71.](#)
- 533 | 16. [Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body](#)  
 534 | [dissatisfaction and unhealthy eating patterns in preschool children: A Delphi](#)  
 535 | [consensus study. \*Body Image\* 2014;11\(4\):418-25.](#)
- 536 | 17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in  
 537 | body weight of German children reverse direction between the ages of 2 and 6 years. *J*  
 538 | *Nutr* 2003;133(3):789-96.

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- 1  
2  
3  
4  
5  
6  
7 539 | ~~16.~~ ~~18.~~ Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of  
8 540 obesity among young U.S. children living in low-income families, 2008-2011.  
9 541 *Pediatrics* 2013;132(6):1006-13.
- 10 542 | ~~17.~~ ~~19.~~ Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ.  
11 543 Development of socioeconomic inequalities in obesity among Dutch pre-school and  
12 544 school-aged children *Obesity (Silver Spring)* 2014;In press
- 13 545 | ~~18.~~ ~~20.~~ Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E.  
14 546 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
15 547 2003(3):CD001872.
- 16 548 | ~~19.~~ ~~21.~~ Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al.  
17 549 Strategies for Recruitment and Retention of Families from Low-Income, Ethnic  
18 550 Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child  
19 551 Weight. *Child Health Care* 2013;42(3):198-213.
- 20 552 | ~~20.~~ ~~22.~~ Starks H, Trinidad SB. Choose your method: a comparison of phenomenology,  
21 553 discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
- 22 554 | ~~23.~~ Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in*  
23 555 *Psychology* 2006;3(2):77-101.
- 24 556 | ~~24.~~ Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with  
25 557 data saturation and variability. *Field Methods* 2006;18(1):59-82.
- 26 558 | ~~25.~~ Report of a WHO consultation. Obesity: preventing and managing the global epidemic. . Formatted: Line spacing: single  
27 559 *World Health Organ Tech Rep Ser*, 2000:1-253.
- 28 560 | ~~21.~~ ~~26.~~ Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et  
29 561 al. CDC growth charts: United States. *Adv Data* 2000(314):1-27.
- 30 562 | ~~22.~~ ~~27.~~ Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et  
31 563 al. 2000 CDC Growth Charts for the United States: methods and development. *Vital*  
32 564 *Health Stat* 11 2002(246):1-190.
- 33 565 | ~~23.~~ ~~28.~~ Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of  
34 566 child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.
- 35 567 | ~~24.~~ ~~29.~~ Starks H, Trinidad SB. Choose your method: a comparison of phenomenology,  
36 568 discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
- 37 569 | ~~25.~~ Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol*  
38 570 *Bull* 2007;133(4):557-80.
- 39 571 | ~~26.~~ ~~30.~~ Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver*  
40 572 *Spring)* 2009;17(5):941-64.
- 41 573 | ~~27.~~ ~~31.~~ Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and  
42 574 strategies when helping their overweight children lose weight. *Qual Health Res*  
43 575 2013;23(10):1333-43.
- 44 576 | ~~28.~~ ~~32.~~ Smolak L, Levine MP, Schermer F. Parental input and weight concerns among  
45 577 elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
- 46 578 | ~~29.~~ Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-  
47 579 old girls. *Pediatrics* 2001;107(1):46-53.
- 48 580 | ~~30.~~ ~~33.~~ Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM.  
49 581 Family weight talk and dieting: how much do they matter for body dissatisfaction and  
50 582 disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.
- 51 583 | ~~31.~~ ~~34.~~ Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents'  
52 584 perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.
- 53 585 | ~~32.~~ ~~35.~~ Warschburger P, Kroll K. Maternal perception of weight status and health risks  
54 586 associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.

- 587 | ~~33.~~ 36. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about  
588 | their child's weight: distinguishing facts from values. *Child Care Health Dev*  
589 | 2013;39(5):722-7.
- 590 | ~~34.~~ 37. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al.  
591 | Changes in lipidemia during chronic care treatment of childhood obesity. *Child Obes*  
592 | 2012;8(6):533-41.
- 593 | ~~35.~~ 38. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb  
594 | musculoskeletal health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.
- 595 | ~~36.~~ 39. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et  
596 | al. Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr*  
597 | 2008;152(4):489-93.
- 598 | ~~37.~~ 40. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health.  
599 | *Am J Public Health* 2010;100(6):1019-28.

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603 Table 1. Descriptive statistics of the sample

	Child (n=16)	Parent (n=22)	Grandparent (n=27)
Age (mean in years, range)	4.6 (3.1-5.7)	32.2 (22.7-49.5)	56.9 (43.0-77.9)
Gender:			
Female	8 (50%)	14 (64%)	21 (78%)
Male	8 (50%)	8 (36%)	6 (22%)
Racial background:			
Euro-American/Caucasian	11 (68%)	21 (95%)	23 (84%)
Native American	0	1 (5%)	0
Asian	0	0	1 (4%)
African-American	0	0	1 (4%)
Mixed	5 (32%)	0	2 (8%)
BMI (mean, range)	17.7 (14.3-21.5)	26.8 (16.1-39.1)	29.1 (16.1-49.4)
Weight status:			
Underweight	0	2 (9%)	1 (3%)
Normalweight	7 (44%)	8 (36%)	8 (30%)
Overweight	4 (25%)	6 (27%)	10 (37%)
Obese	5 (31%)	6 (27%)	8 (30%)
Highest school grade completed	n/a		
High school		8 (82%)	20 (74%)
College/University		4 (18%)	7 (26%)
Working situation	n/a		
Full time		7 (32%)	8 (30%)
Part time		4 (18%)	4 (15%)

Not employed*		11 (50%)	15 (55%)
Annual household income	n/a		
Less than 14,999 USD		8 (36%)	7 (26%)
15,000-24,999 USD		6 (27%)	6 (22 %)
25,000 – 39,999 USD		4 (18%)	6 (22 %)
More than 40, 000 USD		4 (18%)	8 (30 %)

604 \* ~~Main~~The main reasons for unemployment among parents were child care, pursuing higher  
 605 education, and not finding work; among grandparents, unemployment was due to not finding  
 606 work, ~~going on~~reaching retirement, age, or retiring due to ~~personal~~ health issues.

Table 2. ~~Perceptions~~Examples of participants' quotes on perceptions of young children's body sizes. ~~Examples of participant quotes from each of the thematic categories and their constituent themes. The complete sets of pertinent participant quotes are provided as supplemental material.~~

Table Legends: Gp# - family group number; P - parent; G – grandparent.  
 \* = parent/grandparent of child with normal weight  
 \*\* = parent/grandparent of child with overweight  
 \*\*\* = parent/grandparent of child with obesity

**Theme 1: Young children are 'pudgy' or 'big for their age', but not obese**

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...)But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

~~1.8 Gp01P1 (Mother) \*\*\*: she's also getting really tall, but I have a concern that she's getting a little pudgier (...). She's pudgy, she is a little overweight and we're working on it.~~

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never been concerned about her weight.

~~1.16 Gp11P1 (Mother) \*\*\*: she has always been at the 90 or 100 percentile with her age group but in weight and always under in height. She has always been kind of short and stocky.~~

**Theme 2: 'Baby fat' is cute and healthy**

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

~~2.13 Gp07G1 (Mother's mother) \*: [My daughter] was the only one, like I said that [she] was in the 95th percentile. She was the only one I ever wondered about, but she was cute chubby, that I didn't.~~

**Theme 3: Children go through 'growth spurts' and 'stretching out'**

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then

they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

~~3.9 Gp11G1 (Mother's mother) \*\*\*: we've never been concerned when she goes through those eating phases because we know it's her growth spurt and it's not like she's gaining weight this way (out) growing this way (up).~~

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621 Table 3. Perceptions Examples of participants' quotes on perceptions of the timeline of  
622 obesity; examples of participant quotes from each.

623 Table Legends: Gp# - family group number; P - parent; G - grandparent.

624 \* = parent/grandparent of the thematic categories and their constituent themes. The complete  
625 sets child with normal weight

626 \*\* = parent/grandparent of pertinent participant quotes are provided as supplemental material.  
627 child with overweight

628 \*\*\* = parent/grandparent of child with obesity  
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#### ***Theme 4: A high body weight becomes problematic later in childhood***

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

#### ***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

#### ***Theme 6: Obesity becomes problematic in adulthood***

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

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631 Table 4. ~~Pereceptions~~Examples of participants' quotes on perceptions of parental responsibility  
632 and blame for childhood obesity. ~~Examples of participant quotes from each~~

633 Table Legends: Gp# - family group number; P - parent; G - grandparent.

634 \* = parent/grandparent of the thematic categories and their constituent themes. The complete  
635 setschild with normal weight

636 \*\* = parent/grandparent of pertinent participant quotes are provided as supplemental  
637 material-child with overweight

638 \*\*\* = parent/grandparent of child with obesity

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#### ***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

~~7.4 Gp02G1 (Father's mother) \*: I think that if you buy a lot of junk food and that's what you have: soda, chips and things like that... and that's what your child is mostly eating, and they're getting overweight from that, then yes, you have a lot of control.~~

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

~~7.11 Gp04G2 (Mother's father) \*: I see a lot of kids just go and play their computer games and TVs sitting down eating chips, and that's not the kid's fault.~~

~~7.13 Gp12G3 (Father's mother) \*\*\*: If you are active, the kids will be active. If you are into nutrition, the kids will be into nutrition.~~

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

#### ***Theme 8: The parents of obese children are blamed by themselves and by others***

8.1 Gp042 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.4 Gp13P1 (Mother) \*\*\*: If I had a fat kid, it would be looking at me every day, "I'm a failure. I'm doing something wrong."

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.

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641 Table 5. ~~Perceptions~~ Examples of participants' quotes on perceptions of appropriate contexts  
642 for speaking about preschoolers' body weights. ~~Examples of participant quotes from each~~

643 Table Legends: Gp# - family group number; P - parent; G - grandparent.

644 ~~\* = parent/grandparent of the thematic categories and their constituent themes. The complete~~  
645 ~~sets~~ child with normal weight

646 ~~\*\* = parent/grandparent of pertinent participant quotes are provided as supplemental~~  
647 ~~material~~ child with overweight

648 ~~\*\*\* = parent/grandparent of child with obesity~~

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29 ***Theme 9: Parents and grandparents ~~do not~~ discuss preschoolers' body weights with them,***  
30 ***unless only when the children raise the topic***

31 9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she  
32 knows she weighs more than her brother but we've never, I've always told her, "Look at me,  
33 I'm fat, you're not fat".

34 9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few  
35 weeks ago he talked about being fat, and I don't know where he got that from, like another  
36 kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a  
37 surface level.

38 9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than  
39 anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm  
40 bigger, I'm still only five years old".

41 ***Theme 10: It's acceptable to discuss how big or strong preschoolers are.***

42 ~~10.1 Gp12G2 (Father's father) \*\*\*: I can't say that it's [the child's weight] ever come up.~~  
43 ~~Other than to say that "he's sure getting heavy", in growing up.~~

44 10.2 Gp12G3 (Father's mother) \*\*\*: We talk about how fit he is. He's a very fit child.

45 10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, "Yeah, look at his  
46 muscles".

47 ~~10.4 Gp11G1 (Mother's mother) \*\*\*: we talk about her weight and her height a lot because~~  
48 ~~she's a big girl, but not that we're concerned.~~

49 10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always



showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

***Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively***

~~11.1 Gp03P1 (Mother) \*\*\*: So when he [the child] asks me stuff like that [about his weight] we talk about being strong versus being big and not strong. So it's all about trying to be strong and healthy so, that's what we talk about.~~

11.2 Gp03P2 (Father) \*\*\*: By far I don't think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father's mother) \*\*\*: I wouldn't sit with an iron fist and say, "You can't have that because it will make you fat." Because that effects their mental (wellbeing).

11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.

11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much because I do think that girls get set up in this world to worry a lot about that and that it could lead to some problems.

***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a bit, personally, but I don't know because I haven't asked her.

~~12.5 Gp12G2 (Father's father) \*\*\*: I don't think about what his parents think about his weight. I know [his father] is certainly concerned with nutrition~~

12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the parents] – I am not sure they consider it an issue yet.

12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's weight]. (Interviewer: Not with [her husband]?) Um, [my daughter] and I have a closer, more intimate [connection], like [we can] talk about that kind of thing.

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## SUPPLEMENTAL MATERIAL

Supplementary Table 1. Perceptions of young children's body sizes; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

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\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

### *Theme 1: Young children are 'pudgy' or 'big for their age', but not obese*

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...)But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.2 Gp07G1 (Mother's mother) \*: There are going to be kids, that are just by their DNA and genetics, that are a chunkier body build, stuff like that.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.4 Gp13G1 (Mother's mother) \*\*\*: [My daughter] was a larger child, she was never 'obese' or fat or whatever, she was never teased or anything like that.

1.5 Gp14P1 (Mother) \*\*: I think [my daughter] has got a big frame, she has big bones.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

1.7 GP10G4 (Father's stepmother) \*\*: But if a child is just built bigger, then you need to let that go and just realize that's how a child is made.

1.8 Gp01P1 (Mother) \*\*\*: she's also getting really tall, but I have a concern that she's getting a little pudgier (...) She's pudgy, she is a little overweight and we're working on it.

1.9 Gp03G01 (Mother's mother) \*\*\*: [My grandson] has a little bit of a weight issue.

1.10 Gp10G4 (Father's stepmother) \*\*: I think he is a short little toddler. He is a little bit round.

1.11 Gp10G1 (Father's mother) \*\*: Our middle son, when he was in 4th or 5th grade, he was a little chunky (...) He was 10.6 [lbs] when he was born and just a super stout, robust baby the minute he was born.

1.12 Gp13G2 (Mother's father) \*\*\*: He's not overweight at all, he's almost skinny, but he's tall, he's a tall kid. He's always been big and tall for his age.

1.13 Gp16P1 (Father) \*\*: I think it's just, he's a big boy, yeah they are big for their age.

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never

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been concerned about her weight.

1.15 Gp10P1 (Mother) \*\*: I think he has a good amount of weight on his bones. And he is normally big for his age.

1.16 Gp11P1 (Mother) \*\*\*: she has always been at the 90 or 100 percentile with her age group but in weight and always under in height. She has always been kind of short and stocky.

1.17 Gp03G1 (Mother's mother) \*\*\*: he's very big for his age. He's tall. People think he's six, he's only five.

### ***Theme 2: 'Baby fat' is cute and healthy***

2.1 Gp02P1 (Father) \*: she's got some cute baby fat but it's nothing to be worried about.

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.3 Gp05P3 (Mother's mother) \*: You know, she's got that little girl pudgy on her, that's so cute. Actually, I think a couple times this past year, I thought she might be a little underweight, because she didn't seem to have that little toddler pudgy.

2.4 Gp06P1 (Mother) \*\*: I don't worry about his weight right now, it's really hard at this age because I mean all of them are kinda pudgy.

2.5 Gp07P1 (Mother) \*: She's well within range, she's got that cute little extended abdomen of a toddler, you know.

2.6 Gp10G1 (Father's mother) \*\*: our kids were always in the 95th percentile... robust kids. I think he seems very healthy.

2.7 Gp13G1 (Mother's mother) \*\*\*: I think he's in the 50th percentile for weight and over a 100th for height.

2.8 Gp14P1 (Mother) \*\*: I think she is fine, she does have a little belly, but it's not anything I would worry about or say anything. (...) I think she is healthy, I think she is just a big strong girl.

2.9 Gp10P1 (Mother) \*\*: when he got chubby when he was younger, they [grandparents] just thought it was the cutest thing. You know... they are like... they just want to pinch his cheeks.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

2.13 Gp07G1 (Mother's mother) \*: [My daughter] was the only one, like I said that [she] was in the 95th percentile. She was the only one I ever wondered about, but she was cute chubby, that I

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didn't.

***Theme 3: Children go through 'growth spurts' and 'stretching out'***

3.1 Gp10P1 (Mother) \*\*: I really liked how chubby he was. It was really nice to cuddle. And I didn't worry about that. Because I figure when he would grow, that weight would just stretch out.

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.4 Gp11P1 (Mother) \*\*\*: When she starts getting kind of chunky I start waiting for that growth spurt because if it doesn't hit soon I get worried and start watching what she's eating.

3.5 Gp12P2 (Father) \*\*\*: When they're growing, they grow up and they grow out.

3.6 Gp14G1 (Mother's mother) \*\*: I know sometimes kids pudge and then they stretch out.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

3.8 Gp01P1 (Mother) \*\*\*: kids go through different phases and right now is a pudgy stage.

3.9 Gp11G1 (Mother's mother) \*\*\*: we've never been concerned when she goes through those eating phases because we know it's her growth spurt and it's not like she's gaining weight this way (out) growing this way (up).

3.10 Gp14G1 (Mother's mother) \*\*: I know when [my daughter] was in 5th grade, she got heavier, and then she stretched out in high school.

3.11 Gp06G1 (Mother's mother) \*\*: We can tell when he's about to go through a growth-spurt he gets that little teeny tummy.

Supplementary Table 2. Perceptions of the timeline of obesity; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 4: A high body weight becomes problematic later in childhood***

4.1 Gp02G1 (Father's mother) \*: I think that when you see kids that are very overweight at 5, 7 and on up, that there's something going on with their eating. I think that when you have small children, like babies, who are plump, healthy babies, that's a whole different story. But I think that when they're older there's something to it.

4.2 Gp10G2 (Father's father) \*\*: Someone with a child [my grandson's] age... he is just 3... I don't know what data shows. Is there any issue with childhood obesity at that age? I don't know. When they talk about childhood obesity, later on, because humans go through all these different growth spurts

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.5 Gp01G1 (Mother's mother) \*\*\*: when they [obese children] get to school they're going to be teased (...) they're going to be the last ones picked for teams in school.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.7 Gp15G1 (Mother's mother) \*: as he starts to enter the schooling system that [weight] isn't an additional emotional piece of baggage that he has to carry... being ostracized in the area or personally feeling like different.

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.3 Gp05P1 (Mother) \*: if the weight is causing problems and issues in their body and ... then that's a problem.

5.4 Gp08P1 (Mother) \*: If she starts getting like, even more heavier, where I'm noticing maybe that she's depressed, or gaining weight more, or where if I see it affecting the way she looks at herself or her behavior with other kids, her activities, then I would be concerned.

5.5 Gp10P2 (Father) \*\*: If a kid is too fat to do much then it is not going to be healthy.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

5.7 Gp14P1 (Mother) \*\*: As long as they are healthy [weight is not an issue]; if you can visibly see that a child is overweight, and not getting enough activity, then that would matter.

#### ***Theme 6: Obesity becomes problematic in adulthood***

6.1 Gp01P1 (Mother) \*\*\*: I do think that a child's weight matters. Just because you don't want them to develop unhealthy habits early because it's going to follow them for the rest of their life.

6.2 Gp01G2 (Father's mother) \*\*\*: I don't like seeing a child that age to start out being obese. It carries on with them so... I worry about healthy eating with them a little bit because of that.

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.4 Gp06P1 (Mother) \*\*: what motivated me is looking at my child and what I want him – who I want him to be in 25 years as a young man.

6.5 Gp10G2 (Father's stepfather) \*\*: If a child is not getting proper nutrition, especially during certain critical stages, you can have all kinds of long lasting effects, and yes that does speak to weight, certainly.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.7 Gp14G2 (Father's mother) \*\*: I think [weight matters] because what they learn as a child can carry on through their life. What they learn to eat.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.



Supplementary Table 3. Perceptions of parental responsibility and blame for childhood obesity; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

### ***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.2 Gp01P1 (Father) \*\*\*: the parents and grandparents have control of what the children eat.

7.3 Gp02P1 (Father) \*: I think with proper feeding and keeping the proper foods in the house you can control the weight. If you have a bunch of snack foods and junk food all throughout the house and people sit around and watch TV and eat food, you're controlling the weight there and not in a good way – you're going to get heavier.

7.4 Gp02G1 (Father's mother) \*: I think that if you buy a lot of junk food and that's what you have: soda, chips and things like that... and that's what your child is mostly eating, and they're getting overweight from that, then yes, you have a lot of control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.6 Gp06G1 (Mother's mother) \*\*: Just make them [fast foods] a treat, a special treat. Not because you are tired and don't want to cook, because then that becomes too easy for them.

7.7 Gp09G1 (Mother's mother) \*: I think if you sit down and eat as a family, you're not sitting in front of the TV feeding your face, so you're going to limit the amount... you're talking so you're not eating as much.

7.8 Gp13G1 (Mother's mother) \*\*\*: Yeah, a child's weight is easy to control, if you control what goes in and out of their mouth.

7.9 Gp14P1 (Mother) \*\*: She does like to eat, you could hand her a bag of cookies and put her in front of the TV, and she might sit there all day. Or she might not, I don't know, I've never done that. I could see if some parents were lazy, that might be an easy option. I think parents have a lot of influence on the weight of the child.

7.10 Gp13P1 (Mother) \*\*\*: They (parents) need to monitor what their child's eating and make



sure they're being active.

7.11 Gp04G2 (Mother's father) \*: I see a lot of kids just go and play their computer games and TVs sitting down eating chips, and that's not the kid's fault.

7.12 Gp09P1 (Mother) \*: three year-olds should be running around, they should be active and they shouldn't be sitting on the couch eating Cheetos all day. So that's not a very healthy lifestyle and to each their own with parenting but in my personal opinion, I think it can be controlled.

7.13 Gp12G3 (Father's mother) \*\*\*: If you are active, the kids will be active. If you are into nutrition, the kids will be into nutrition.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

7.15 Gp15P1 (mother) \*: some kids will be more susceptible to gaining weight than others (...) but I think it's totally controllable what you're going to feed them.

***Theme 8: The parents of obese children are blamed by themselves and by others***

8.1 Gp04P2 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.2 Gp05G3 (Mother's mother) \*: Sometimes I see heavy parents who don't seem to exercise, and don't seem to eat right. And I see their children, and I say, "Oh my gosh, they are passing that down to the next generation."

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.4 Gp13P1 (Mother) \*\*\*: If I had a fat kid, it would be looking at me every day, "I'm a failure. I'm doing something wrong."

8.5 Gp04P2 (Mother) \*: I think most adults who are overweight can probably attribute it to their parents.

8.6 Gp11P1 (Mother) \*\*\*: I hate those parents who are like, "Well, she'll only eat at McDonald's." "No! She won't. You let her only eat at McDonald's. Or you let her only eat fruit snacks."

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.8 Gp13G2 (Mother's father) \*\*\*: to me, seeing an overweight six year old, it's like what is going on here? I think it's the adults, the parents, guardians, are the ones who have the most effect on that.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic

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3 and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I  
4 wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or  
5 something at 400 pounds because I was too lazy.  
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8 8.10 Gp03P1 (Mother) \*\*\*: They [medical staff] kept asking me what I was feeding him because  
9 he was getting so chubby (...) I kept thinking, "What am I doing wrong?"  
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Supplementary Table 4. Perceptions of appropriate contexts for speaking about preschoolers' body weights; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 9: Parents and grandparents do not discuss preschoolers' body weights with them, unless the children raise the topic***

9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".

9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.

9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".

9.4 Gp09P1 (Mother) \*: I don't like this but she does have a fascination with my scale—she doesn't know what the numbers mean but she likes to get on there and I'll be like, "Oh my God, you gained a pound!" and she'll get excited (...) but I think she's still too young to know what (body) image is.

9.5 Gp01G1 (Father's mother) \*\*\*: I think she is totally oblivious to it [weight] which is good in a way.

9.6 Gp02P1 (Father) \*: I don't think she's noticed any difference between the her and her sister... she's not really conscious of it yet, she is just her.

9.7 Gp10P1 (Mother) \*\*: I don't think he thinks about his weight. We never talk about it. It is almost like nonexistent, especially at his age

9.8 Gp05P3 (Mother's mother) \*: She's very comfortable with her body. (...) I think she's aware that she has a body, and that it functions. (...) But I don't think she's really aware of, "oh, I'm too skinny, I'm too fat."

9.9 Gp14P1 (Mother) \*\*: I don't think she thinks anything of it. She is comfortable walking around the house with no clothes on. I don't think she thinks anything of it, she has never said anything.

***Theme 10: It's acceptable to discuss how big or strong preschoolers are***

10.1 Gp12G2 (Father's father) \*\*\*: I can't say that it's [the child's weight] ever come up. Other

than to say that “he’s sure getting heavy”, in growing up.

10.2 Gp12G3 (Father’s mother) \*\*\*: We talk about how fit he is. He’s a very fit child.

10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, “Yeah, look at his muscles”.

10.4 Gp11G1 (Mother’s mother) \*\*\*: we talk about her weight and her height a lot because she’s a big girl, but not that we’re concerned.

10.5 Gp10G1 (Father’s mother) \*\*: We might have in passing commented to how healthy he seems. I mean, just something sort of innocuous and nothing really of concern.

10.6 Gp04P1 (Father) \*: We talk about how he's growing and how he weighed and checked up.

10.7 Gp04P2 (Mother) \*: He [the child] just thinks it’s a cool number. He gets excited to get weighed, “am I getting bigger?”

10.8 Gp04G3 (Mother’s mother) \*: it's been awhile since we've talked about it. We used to talk about it every time he came back from the doctor. The percentile he was in and such.

10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

10.10 Gp07G1 (Mother’s mother) \*: She’s [the child’s mother] never, that I can think has ever expressed any concern about her weight. She makes comments, like “Boy, I can tell [the child] must be going through a growth spurt.”

10.11 Gp09P1 (Mother) \*: They [grandparents] always joke and say that she looks just like Daddy because Daddy’s kind of tall and lean.

***Theme 11: Discussing preschoolers’ body weights can affect their self-esteem negatively***

11.1 Gp03P1 (Mother) \*\*\*: So when he [the child] asks me stuff like that [about his weight] we talk about being strong versus being big and not strong. So it’s all about trying to be strong and healthy so, that’s what we talk about.

11.2 Gp03P2 (Father) \*\*\*: By far I don’t think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father’s mother) \*\*\*: I wouldn’t sit with an iron fist and say, “You can’t have that because it will make you fat.” Because that effects their mental (wellbeing).

11.4 Gp01P1 (Mother) \*\*\*: I have a concern that she’s getting a little pudgier so I’m like, “If you’re going to do milk, please go down to the skim or 1%, lay off the juice or dilute it”, to start doing the things that she won’t notice.

11.5 Gp14G2 (Father’s mother) \*\*: I don't think a parent should badger them about their eating habits, I think there are ways to slowly and gradually make changes to lose weight rather than

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4 pointing it out.

5 11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their  
6 weight in some ways. Especially when it's just a healthy thing. I think it's best to not say  
7 anything.  
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10 11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much  
11 because I do think that girls get set up in this world to worry a lot about that and that it could lead  
12 to some problems.  
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14 ***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each***  
15 ***other, unless there is a perceived problem***  
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18 12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a  
19 bit, personally, but I don't know because I haven't asked her.

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21 12.2 GP10G4 (Stepmother of the father) \*\*: I never talk about his [the child's] weight.

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23 12.3 Gp06P1 (Mother) \*\*: No, I don't think she [grandmother] thinks he's at an unhealthy  
24 weight. (...) She's never said anything to me.  
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27 12.4 Gp12G3 (Father's mother) \*\*\*: I think they [the parents] should be very pleased with it [the  
28 child's weight], but I don't know.

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30 12.5 Gp12G2 (Father's father) \*\*\*: I don't think about what his parents think about his weight. I  
31 know [his father] is certainly concerned with nutrition

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33 12.6 Gp07P1 (Mother) \*: I think that my mom probably would think it [the child's weight]  
34 doesn't matter. (...) [I]t's never something we discuss.  
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37 12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the  
38 parents] – I am not sure they consider it an issue yet.

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40 12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that  
41 because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

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43 12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's  
44 weight]. (Interviewer: Not with [her husband]?) Um, [my daughter] and I have a closer, more  
45 intimate [connection], like [we can] talk about that kind of thing.  
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# BMJ Open

## "A Little on the Heavy Side": A Qualitative Analysis of Parents' and Grandparents' Perceptions of Preschoolers' Body Weights

Journal:	<i>BMJ Open</i>
Manuscript ID:	bmjopen-2014-006609.R2
Article Type:	Research
Date Submitted by the Author:	17-Nov-2014
Complete List of Authors:	Eli, Karin; University of Oxford, Institute of Social and Cultural Anthropology Howell, Kyndal; University of Oregon, Department of Psychology Fisher, Philip; University of Oregon, Department of Psychology Nowicka, Paulina; Karolinska Institutet, Clinical Science, Intervention and Technology; University of Oxford, Institute of Social and Cultural Biology
<b>Primary Subject Heading</b>:	Public health
Secondary Subject Heading:	Qualitative research
Keywords:	PAEDIATRICS, Community child health < PAEDIATRICS, PRIMARY CARE, PUBLIC HEALTH

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Manuscripts

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3 1 “A Little on the Heavy Side”: A Qualitative Analysis of Parents’ and Grandparents’  
4 2 Perceptions of Preschoolers’ Body Weights  
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3 19 **Abstract**  
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8 21 **OBJECTIVES:** Parents' difficulties in perceiving children's weight status accurately pose a  
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10 22 barrier for family-based obesity interventions; however, the factors underlying weight  
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12 23 misinterpretation still need to be identified. This study's objective was to examine parents and  
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14 24 grandparents' perceptions of preschoolers' body sizes. Interview questions also explored  
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16 25 perceptions of parental responsibility for childhood obesity and appropriate contexts in which  
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18 26 to discuss preschoolers' weights.  
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20 27 **DESIGN:** Semi-structured interviews, which were videotaped, transcribed, and analyzed  
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22 28 qualitatively.  
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24 29 **SETTING:** Eugene and the Springfield metropolitan area, Oregon, USA  
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26 30 **PARTICIPANTS:** Families of children aged 3-5 years were recruited in February – May  
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28 31 2011 through advertisements about the study, published in the job seekers' sections of a  
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30 32 classified website (Craigslist) and in a local newspaper. 49 participants (22 parents and 27  
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32 33 grandparents, 70% women, 60% with overweight/obesity) from sixteen low-income families  
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34 34 of children aged 3-5 years (50% girls, 56% with overweight/obesity) were interviewed.  
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36 35 **RESULTS:** There are important gaps between clinical definitions and lay perceptions of  
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38 36 childhood obesity. While parents and grandparents were aware of their preschoolers' growth  
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40 41 chart percentiles, these measures did not translate into recognition of children's overweight or  
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42 42 obesity. The participants spoke of obesity as a problem that may affect the children in the  
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44 43 future, but not at present. Participants identified childhood obesity as being transmitted from  
45  
46 44 one generation to the next, and stigmatized it as resulting from 'lazy' parenting. Parents and  
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48 45 grandparents avoided discussing the children's weights with each other and with the children  
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50 46 themselves.  
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3 43 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with  
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5 44 parents and grandparents about the meaning and appearance of obesity in early childhood, as  
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7 45 well as counteract the social stigma attached to obesity, in order to improve the effectiveness  
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9 46 of family-based interventions to manage obesity in early childhood.  
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3 49 **Strengths and limitations of this study**  
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- 5 50 • This study's sample is the largest ever reported in a qualitative investigation of family  
6 51 members' perceptions of preschoolers' body weights.  
7 52 • While most previous studies focused only on mothers' perceptions of their  
8 53 preschoolers' body weights, this study included mothers, fathers, grandmothers, and  
9 54 grandfathers, recognizing that various adult family members influence young  
10 55 children's body image, eating, and exercise habits.  
11 56 • Although low-income participants tend to be difficult to reach, the study successfully  
12 57 recruited a predominantly low-income sample.  
13 58 • The sample primarily consisted of families of Caucasian origin, and thus did not allow  
14 59 for an investigation of the influence of cultural background on perceptions of  
15 60 children's body sizes.  
16 61 • As several participants were single mothers, the number of fathers was not high  
17 62 enough to enable an assessment of potential differences between fathers' and mothers'  
18 63 perceptions.  
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## 66 INTRODUCTION

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68 While there is growing evidence of the superior effectiveness of lifestyle interventions  
69 initiated early in childhood<sup>1-3</sup>, one of the main barriers in conducting such interventions is  
70 parents' lack of recognition of, or concern about, obesity in children. Parents' difficulties in  
71 perceiving children's body sizes accurately have been demonstrated since the early 2000s,  
72 across many countries, cultures and child ages<sup>4-6</sup>. A recent study of over 16,000 children aged  
73 2-9 years from eight European countries has shown that, among parents of overweight  
74 children, 63% perceived their children's weights as 'proper', independent of educational  
75 level<sup>7</sup>. Moreover, a meta-analysis of 69 studies on parental perceptions of children's body  
76 weights showed that half of the parents underestimated their children's weight.<sup>8</sup>

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78 Most studies have applied a quantitative approach to describe parents' miscategorization of  
79 children's weight status; however, the underlying factors have not been identified  
80 conclusively<sup>6</sup>. To date, only two studies<sup>9 10</sup> have used in-depth interviews to examine how  
81 parents make sense of children's body weights and their health implications. In their study of  
82 low income mothers, Jain et al have shown that most mothers did not worry about their  
83 children's body weights if the children were active and socially accepted; the mothers,  
84 moreover, distrusted pediatric growth charts, and attributed childhood obesity to genetics,  
85 rather than to factors modifiable in the home environment<sup>9</sup>. Misinterpretation of growth  
86 charts was also highlighted by Rich et al, who found that 80% of parents perceived their child  
87 as healthy although the child's weight was at the 95<sup>th</sup> percentile. These parents, notably, were  
88 aware of obesity related health risks<sup>10</sup>. More recently, focus groups revealed that, in assessing  
89 their children's body sizes, parents tend not to rely on clinical measurements; rather, they

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3 90 often compare their children visually to other children whose body sizes can be defined as  
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5 91 extreme, thus skewing their perceptions of what a healthy body size is<sup>11</sup>.  
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10 93 So far, existing research on parental perceptions of children's body weights has focused  
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12 94 almost exclusively on mothers, and has not examined the critical influence of other family  
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14 95 members, such as fathers and grandparents<sup>12</sup>. Because family-based interventions have been  
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16 96 proposed as the most effective approach to treating child obesity<sup>13 14</sup>, knowledge about how  
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18 97 other adult caretakers perceive and discuss young children's body weights will contribute to  
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20 98 understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-  
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22 99 judgmental communication about children's eating practices and body sizes is important for  
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24 100 the prevention of body dissatisfaction and disordered eating in childhood and adolescence<sup>15 16</sup>.  
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26 101 To examine caretakers' perceptions of young children's body weights from a broader familial  
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28 102 perspective, we designed this study to include family sets of parents and grandparents actively  
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30 103 involved in taking care of preschool age children. While investigating communication about  
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32 104 food and physical activity among parents and grandparents of preschoolers was the main aim  
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34 105 of the study, the participants' perceptions of children's body weights were essential to the  
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36 106 study. All participants answered several questions about this topic, resulting in rich and  
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38 107 unique material. Given this, we found that this topic merited dedicated discussion, apart from  
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40 108 the larger study. As childhood obesity remains high among families with low socioeconomic  
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42 109 status<sup>17-19</sup>, and as it is more difficult to recruit and retain these families in intervention  
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44 110 programs<sup>20 21</sup>, we chose to target a low income population.  
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112 **METHODS**113  
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3 114 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield  
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5 115 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements  
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7 116 about the study, published in a local newspaper and the volunteers' and job seekers' sections  
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9 117 of Craigslist (the most widely used classified advertisement website in the United States). The  
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11 118 active involvement of grandparents in family life (defined as spending time with the  
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13 119 grandchild at least twice a month) was the primary criterion for inclusion in the study.  
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15 120 Consequently, only families in which at least one parent and one grandparent were willing to  
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17 121 be interviewed were included in the study. The other inclusion criteria specified that the  
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19 122 child's age must be between 3-5 years, and that the child should have no underlying medical  
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21 123 condition or disability which would affect his/her weight. All families who contacted the  
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23 124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.  
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25 125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.  
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27 126 When the participants first met with the researchers, and before the interviews took place, the  
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29 127 researchers verbally explained the informed consent forms to each participant, and answered  
30  
31 128 any questions participants had. If the parents/grandparents agreed to participate, they were  
32  
33 129 asked to read and sign the written project description and project consent forms. The families  
34  
35 130 received a copy of the written study description and informed consent forms.  
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42 132 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.  
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44 133 Free child care was provided on site, and the children were not present during the interviews.  
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46 134 Each interviewed participant received compensation of \$50 for participating in the study.  
47  
48 135 Prior to the interview, parents and grandparents completed a comprehensive  
49  
50 136 sociodemographic questionnaire routinely used in research projects involving families at the  
51  
52 137 Oregon Social Learning Center; the questionnaire included items concerning family  
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54 138 composition, parental education, employment status, and living conditions. All the  
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3 139 interviewed parents and grandparents as well as the preschooler in focus had their height and  
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5 140 weight measured, without shoes and wearing only light clothing, by trained research staff  
6  
7 141 prior to the interviews. The interviews, which were conducted by a single researcher (either  
8  
9 142 the second or the last author), lasted 1.5-2.5 hours and explored the different roles of family  
10  
11 143 members in shaping a child's lifestyle. Before coding, all participant names were changed to  
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13 144 ensure confidentiality.  
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18 146 This paper focuses on the parents' and grandparents' perceptions of young children's body  
19  
20 147 weights, with particular emphasis on overweight and obesity, parental responsibility for  
21  
22 148 childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body  
23  
24 149 weights. The main questions are summarized in Table 1.  
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29 151 *Insert Table 1 here.*  
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33  
34 153 It should be noted that while all participants were asked the same main questions, the  
35  
36 154 interview process allowed for fluidity, and follow-up questions were adapted according to  
37  
38 155 each participant's responses. Additionally, while the majority of data directly refer to the main  
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40 156 questions listed, the present analysis includes pertinent comments the participants made  
41  
42 157 throughout the interviews. The interviews were videotaped and transcribed in full;  
43  
44 158 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this  
45  
46 159 paper, transcript sections that related to the main questions were extracted and collated. The  
47  
48 160 transcripts were then coded independently by the first and the last author, using a thematic  
49  
50 161 discourse analysis approach. Discourse analysis is concerned with people's use of language to  
51  
52 162 describe and make sense of their realities, and is an appropriate approach for qualitative  
53  
54 163 studies that examine people's definitions of and spoken attitudes towards health issues<sup>22</sup>.  
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3 164 Thematic analysis facilitates the identification of patterns in qualitative data, and therefore  
4  
5 165 allowed the researchers to delineate themes across the data set<sup>23</sup>. Over several in-person  
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7 166 meetings and email correspondence, the two coders compared and discussed their codes, to  
8  
9 167 examine and resolve potential disagreements, and reach consensus on the clustering of codes  
10  
11 168 into themes and on the grouping of themes under thematic categories.  
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## 15 16 170 **RESULTS**

17  
18 171 In total, 49 family members (70% female) from sixteen families were interviewed. The  
19  
20 172 sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation  
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22 173 <sup>24</sup>. Seven families consisted of single parent with sole responsibility for the child (five single  
23  
24 174 mothers and two single fathers). In ten families, only one grandparent was interviewed; in two  
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26 175 families, two grandparents were interviewed; in three families, three grandparents were  
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28 176 interviewed; and in one family, four grandparents were interviewed. In five of the families, all  
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30 177 grandparents who had contact with the grandchild were interviewed. The most common  
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32 178 reason for not being able to include full sets were the other grandparents' residing outside the  
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34 179 study area.  
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41 181 Participants' characteristics are summarized in Table 2. All data refer to parents and  
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43 182 grandparents who were interviewed as part of the study. Due to the targeted recruitment  
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45 183 process (ads in job advertisement sections) the sample displayed low levels of education and  
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47 184 income; as many as 50% of parents were unemployed. The majority of children, parents and  
48  
49 185 grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific  
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51 186 Northwest.  
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3 188 All the interviewed parents and grandparents as well as the preschooler in focus had their  
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5 189 height and weight measured, without shoes and wearing only light clothing, by trained  
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7 190 research staff prior to the interviews. These measurements were taken in order to  
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9 191 contextualize the participants' stated perceptions of and attitudes toward childhood  
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11 192 overweight/obesity and associated lifestyle factors. In most cases, the researcher who took the  
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13 193 participants' weight and height measurements also interviewed them. However, this did not  
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15 194 influence the study, as the participants' and the children's BMI statuses were not calculated  
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17 195 prior to the interviews, so as not to bias the interview process. Thus, the interviewers and the  
18  
19 196 participants were not informed about the child's or any of the adult family members' weight  
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21 197 status. The interviewers were informed about the participants' and the children's weight  
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23 198 statuses following the interviews; the participants were not informed about their own or their  
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25 199 children's weight statuses. More than half of parents and two thirds of grandparents had  
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27 200 overweight or obesity, according to World Health Organization criteria<sup>25</sup>. Of the children,  
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29 201 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile < Body Mass Index (BMI)  
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31 202 < 95<sup>th</sup> percentile; obesity: BMI ≥ 95<sup>th</sup> percentile)<sup>26-28</sup>; those five who were categorized as  
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33 203 obese were in the 95<sup>th</sup>, 96<sup>th</sup>, 98<sup>th</sup> (two children) and 99<sup>th</sup> percentiles for their BMI.  
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205 *Insert Table 2 here.*

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207 The analysis yielded twelve major themes, clustered under four thematic categories:  
208 Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions  
209 of parental responsibility and blame for childhood obesity, and perceptions of appropriate  
210 contexts for speaking about preschoolers' body weights. While the number of fathers was not  
211 high enough to enable an assessment of differences between fathers' and mothers' perceptions  
212 and attitudes, there did not appear to be gender differences in participants' accounts.

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3 213 Furthermore, no generational differences were observed between the parents' and the  
4  
5 214 grandparents' perceptions of their preschoolers' body sizes. Examples of participant quotes  
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7 215 from each of the thematic categories and their constituent themes are presented in table format  
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9  
10 216 (Tables 3-6). The complete sets of pertinent participant quotes are provided as supplemental  
11  
12 217 material (Supplementary Tables 1-4).

13 218

14  
15  
16 219 *Insert Tables 3-6 here.*  
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23 222 **Perceptions of young children's body sizes (Table 3)**

24  
25 223 None of the participants used the words 'obese' or 'overweight' to describe the preschoolers  
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27 224 who were later identified as such. The participants used a range of words to describe the body  
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29 225 sizes of these preschoolers, including 'pudgy', 'chunky', 'solid', 'stout', 'chubby', 'stocky',  
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31 226 'big boned', and 'robust'. Several participants described the preschoolers as 'tall' and/or 'big  
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33 227 for their age'. Notably, even the father of the heaviest child in the sample (99<sup>th</sup> percentile)  
34  
35 228 described his child as 'a little on the heavy side'. Across the sample, including the parents and  
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37 229 grandparents of normal weight children, the participants spoke of 'baby fat' as cute and  
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39 230 healthy, and even as something to encourage. A few participants also spoke of children's  
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41 231 higher percentiles on the growth charts (>90<sup>th</sup> percentile) in positive terms. The parents and  
42  
43 232 grandparents of the overweight or obese preschoolers said their body weight was not  
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45 233 worrisome because children go through 'growth spurts' and 'stretch out', such that their  
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47 234 current excess weight will eventually convert into height.  
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54 236 **Perceptions of the timeline of obesity (Table 4)**  
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3 237 The participants spoke of obesity as a problem that may affect the preschoolers in the future,  
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5 238 but not at present. Several participants indicated that a high body weight becomes problematic  
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7 239 when the child reaches school age, particularly due to the risk of teasing, social exclusion, and  
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9 240 bullying. Participants also said that a high body weight becomes problematic when it  
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11 241 negatively affects the child's health, activities, behaviors, or mood. However, only one  
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13 242 participant, whose child was in the 99<sup>th</sup> percentile for weight, said that she could notice the  
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15 243 detrimental effects of the child's body weight at present. Thus, even when speaking of obesity  
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17 244 in terms of impact on activity and health, the participants placed it outside the remit of the  
18  
19 245 preschoolers' current experience. Participants also spoke of obesity as problematic due to its  
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21 246 manifestations in adulthood, expressing that children's body weights and their eating and  
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23 247 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing]  
24  
25 248 more trouble as an adult'.  
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### 32 **Perceptions of parental responsibility and blame for childhood obesity (Table 5)**

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34 251 The participants identified parents as bearing primary responsibility for their children's eating  
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36 252 and exercise habits and for their body weights. Even those participants who spoke of body  
37  
38 253 size as being affected by genetics asserted that parents can still influence their children's body  
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40 254 weights. Likewise, participants who mentioned that children may be overweight or obese due  
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42 255 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making  
43  
44 256 sure the child's medical problem is identified and resolved. The participants argued that  
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46 257 parents are responsible for children's body weights because they can control what their  
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48 258 children eat, provide a healthy food environment at home, encourage their children to play  
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50 259 outside and be active, and model healthy behaviors themselves.  
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3 261 The participants' concepts of parental responsibility linked with their attitudes towards  
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5 262 parental blame for childhood obesity. Several participants said they 'judged' parents whose  
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7 263 children were obese; some even said that the parents of obese children were guilty of child  
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9 264 neglect or abuse. Participants identified childhood obesity as being transmitted from one  
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11 265 generation to the next, and as the result of 'lazy' parenting. Having an obese child was an  
12  
13 266 outward sign of 'failing' as a parent, and one mother whose child was obese spoke of feeling  
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15 267 blamed by clinicians for the child's weight gain, which, as she said, neither she nor the child's  
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17 268 clinicians could explain.  
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### 271 **Perceptions of appropriate contexts for speaking about preschoolers' body weights**

#### 272 **(Table 6)**

273 The participants described discussions of preschoolers' body weights as sensitive, often  
274 unnecessary, and potentially dangerous. The decision to engage in discussion about children's  
275 body weights was context dependent. Participants said they discussed their children's or  
276 grandchildren's body weights with them only if the children themselves raised the topic.  
277 Those participants whose preschoolers did not mention body weight said they had never  
278 discussed the issue with them. Several participants said that children of preschool age do not  
279 have body image concepts related to weight. Some participants cited their preschoolers'  
280 'apparent 'comfort' with – or lack of self-consciousness about – their bodies as signaling a  
281 lack of concern with body image. A number of participants also said they avoided discussions  
282 of their preschoolers' body weights because these discussions could be harmful to the  
283 children's self-esteem and emotional wellbeing.  
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3 285 Notably all parents, with the exception of two, avoided discussing their children's body  
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5 286 weights not only with the children themselves, but also with the children's grandparents;  
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7 287 likewise, excepting one grandmother, all grandparents avoided discussing their  
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9 288 grandchildren's body weights with the parents. Participants described these discussions as  
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11 289 unnecessary when body weight was 'not an issue'. It was only when a child's body weight  
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13 290 was perceived as problematic (in the case of the largest child in the sample) that parents and  
14  
15 291 grandparents said they openly discussed it with each other. However, while most participants  
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17 292 said they did not discuss body weights, they identified comments on children's 'healthy'  
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19 293 appearance, growth, or muscle definition as appropriate and positive. Thus, although  
20  
21 294 participants were reluctant to discuss the preschoolers' body weights, they did discuss the  
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23 295 preschoolers' body sizes, with attention to how 'big' or 'strong' they were.  
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## 32 **DISCUSSION**

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36 300 This study's findings suggest that the parents and grandparents of preschool age children face  
37  
38 301 difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous  
39  
40 302 research has found that low income mothers are not concerned about preschoolers'  
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42 303 overweight because they attribute body weight to genetic heredity<sup>9</sup>. However, in this study,  
43  
44 304 the participants strongly endorsed the idea that parents bear primary responsibility for their  
45  
46 305 children's eating and exercise habits and body weights. Nevertheless, the participants did not  
47  
48 306 speak of their own children or grandchildren as overweight or obese. Notably, the  
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50 307 participants' responses were consistent across the sample, and no generational differences  
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52 308 were observed between the parents' and the grandparents' perceptions of their preschoolers'  
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54 309 body sizes.  
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311 Although the participants recognized obesity in general as a problem, they normalized their  
312 own children's and grandchildren's excess body weight as 'toddler pudge' or 'cute baby fat'.

313 Like Jain et al<sup>9</sup>, the authors of the present study suggest that most participants used these  
314 words not as euphemisms, as underscored by the participants' consistent descriptions of  
315 children's higher body weights in positive terms – as 'cute' or 'healthy'. While participants  
316 said that preschoolers' body weights would be problematic if the child became 'visibly  
317 overweight', it was less clear how a 'visibly overweight' preschooler might look. The  
318 participants' discussions focused, instead, on signs that might negate 'visible overweight' in a  
319 preschooler, including tallness, muscularity, and physical strength. As noted by Jones et al<sup>11</sup>,  
320 when participants described obesity, it was through extreme cases of morbid obesity in later  
321 childhood or adulthood, with some citing examples of older children who were 'miniatures of  
322 their parents' and contestants on *The Biggest Loser* who weighed 400 lbs. Future research  
323 should explore how a 'visibly overweight' preschooler might look to parents and  
324 grandparents.

325

326 Just as the participants visualized obesity through images of older children or adults, they also  
327 spoke of obesity as a problem that might affect children later in life, but not in preschool age.  
328 Participants spoke of suffering from teasing as a school age child, or from poor health as an  
329 adult, as the consequences that marked obesity as a problem. While participants did say that  
330 they would recognize a body weight problem if their preschoolers showed negative changes in  
331 behavior, activity, and mood, they did not name immediate health risks. The participants'  
332 depictions of obesity revealed a disconnect between knowledge and perception, previously  
333 shown by Rich et al<sup>10</sup>. Although they were aware of their preschoolers' growth chart  
334 percentiles, most participants did not link these percentiles with the categories of 'overweight'



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3 335 and ‘obesity’. Likewise, although participants were aware of the health risks associated with  
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5 336 obesity in adulthood, they did not link their preschoolers’ body weights with potential  
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7 337 problems in the present tense.  
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11 339 While the participants did not associate obesity with early childhood, they did take  
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13 340 responsibility for their preschoolers’ body weights, and endorsed healthy eating and exercise  
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15 341 practices. Along similar lines, however, the participants – including some whose children  
16  
17 342 were classified as obese –blamed parents for childhood obesity. The participants’ expressions  
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19 343 of judgment toward the parents of obese children were aligned with broader social stigma  
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21 344 attached to obesity<sup>29 30</sup>. Given the participants’ stigmatizing attitudes, it is not surprising that  
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23 345 they did not discuss their preschoolers’ body weights with other family members. Although  
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25 346 parents and grandparents did discuss children’s body sizes through comments on how ‘big’,  
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27 347 ‘strong’, ‘healthy’, or ‘muscular’ they were, most participants whose preschoolers were  
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29 348 classified as overweight or obese did not discuss their body weights with family members,  
30  
31 349 except when there was a perceived health problem. It is possible that, for the participants,  
32  
33 350 discussion of body weight threatened to expose both themselves and their children to the risk  
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35 351 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is  
36  
37 352 important to note that, in deciding not to discuss body weight with their preschoolers (unless  
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39 353 the children themselves raised the topic), the participants protected the children’s body image  
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41 354 and self-esteem. Moreover, like the parents described by Andreassen et al <sup>31</sup>, those parents  
42  
43 355 who recognized their children needed to lose weight attempted to enact weight loss strategies  
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45 356 without explicitly mentioning weight. As previous studies have shown, parental comments  
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47 357 about body weight are associated with body dissatisfaction and reduced self-esteem in  
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49 358 children<sup>15 32 33</sup>, such that the participants’ stance on avoiding ‘weight talk’ with children was  
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51 359 positive. In cases where children are enrolled in clinical treatment programs for obesity  
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3 360 management, however, it is important that clinicians, parents, and grandparents identify  
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5 361 sensitive and supportive ways of framing the topic of body weight. A recent study has  
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7 362 proposed a set of guidelines to help parents discuss body image and eating with preschool  
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9 363 aged children in a supportive way that is protective of children's self-esteem<sup>16</sup>.

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14 365 The results of this study suggest that there are important gaps between clinical definitions and  
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16 366 lay perceptions of childhood obesity. While parents and grandparents are aware of their  
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18 367 preschoolers' growth chart percentiles, these measures do not translate into recognition of  
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20 368 young children's overweight or obesity. Without visual examples of how a preschool age  
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22 369 child with overweight or obesity might look, such as sketched silhouettes or photographs at  
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24 370 different weight categories<sup>34-36</sup>, parents and grandparents continue to speak of children's  
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26 371 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later  
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28 372 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss  
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30 373 young children's body weights with the children and with one another, this might affect the  
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32 374 success of clinical interventions for childhood obesity, in which children's caretakers are  
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34 375 forced into a new and uncomfortable discussion.

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41 377 The clinical implications of this study include several components. In discussions with parents  
42  
43 378 and grandparents of preschool age children, clinicians should clarify how children's fat  
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45 379 distribution and body sizes typically change with age. Clinicians should also speak with  
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47 380 children's caretakers about the meaning of growth chart percentiles, and provide visual  
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49 381 examples of how children might look in each of the percentile categories. Moreover,  
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51 382 clinicians should emphasize the immediate problems associated with obesity in early  
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53 383 childhood, such as hypertension (present in more than 50% of children with obesity),  
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55 384 dyslipidemia, motor skill development and orthopedic complications<sup>37-39</sup>.

385

386 The results also suggest that the countering of stigma should be an important part of the  
387 clinical management of childhood obesity. Given the social stigma and blame attached to  
388 parents of children with obesity, parents might contest a child's obesity diagnosis and be  
389 reluctant to take part in interventions to manage their child's condition<sup>40</sup>. It is therefore crucial  
390 that clinicians directly address stigma when they speak to parents, emphasizing that childhood  
391 obesity is not the parents' fault, and that managing this condition together is a positive step.  
392 Similarly, clinicians should avoid addressing parents of children with obesity in ways that  
393 might make them feel guilty or judged. Finally, it is important that clinicians frame  
394 discussions of children's body weights sensitively, and encourage parents and grandparents to  
395 address children's eating and physical activity practices through positive words and actions,  
396 without emphasizing body weight to the children themselves.

397

398 This study had some limitations. While the sample was the largest ever reported in a  
399 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning  
400 preschoolers' body weights, the families were mainly of Caucasian origin, representing the  
401 ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence  
402 of cultural background on perceptions of children's body sizes, which several studies have  
403 identified as important<sup>5 18 30</sup>, could not be investigated. As the study targeted families of low  
404 socioeconomic status, further research is needed to determine whether the results can be  
405 generalized to other populations. Additionally, as several participants were single mothers, the  
406 number of fathers was not high enough to enable an assessment of differences between  
407 fathers' and mothers' perceptions and attitudes. Finally, while a number of families had a full  
408 or nearly-full set of grandparents participating, some had only one or two grandparents  
409 participating, due to circumstances such as the other grandparents' living outside the area.

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## CONCLUSION

This study was the first to focus on both parents' and grandparents' perceptions of preschoolers' body weights, and is the largest qualitative study to date to include a mixed familial sample of adult caretakers of preschool age children, with subsamples of parents and grandparents that meet data saturation standards<sup>24</sup>. The study's results demonstrate that while parents and grandparents recognize childhood obesity as problematic, endorse healthy eating and exercise habits, and take responsibility for children's body weights, they find it difficult to recognize and discuss young children's overweight and obesity. The results suggest that clinicians should clearly communicate with parents and grandparents about the meaning and appearance of obesity in early childhood, as well as counteract the social stigma attached to obesity, in order to improve the effectiveness of family-based interventions to manage obesity in early childhood.

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5 436 **ACKNOWLEDGMENTS**6  
7 437 We thank all the participating families, as well as Eliah Prichard, Jessica Farmer, Kelly  
8  
9 438 Underwood, Bryn Shepherd and Waihan Leung, the University of Oregon students who  
10  
11 439 transcribed the interviews.  
1213  
14 44015  
16 441 **CONTRIBUTORSHIP STATEMENT**17  
18 442 Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote  
19  
20 443 the manuscript, and approved the final manuscript as submitted.  
2122  
23 444 Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the  
24  
25 445 manuscript, and approved the final manuscript as submitted.  
2627  
28 446 Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed  
29  
30 447 the manuscript and approved the final manuscript as submitted.  
3132  
33 448 Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and  
34  
35 449 supervised data collection and analysis, coded the interviews and analyzed them together with  
36  
37 450 Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.  
3839  
40 451 **COMPETING INTERESTS**41  
42 452 We have read and understood BMJ policy on declaration of interests and declare that we have  
43  
44 453 no competing interests.  
4546  
47 45448  
49 455 **FUNDING**50  
51 456 This work was supported by grants to PN from the Sweden-America Foundation, the Oregon  
52  
53 457 Social Learning Center and the Marie Curie VINNMER International Qualification (2011-  
54  
55 458 03443).  
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3 460 **DATA SHARING**

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5 461 Online supplementary table S1-4 containing complete sets of pertinent participant quotes. No  
6  
7 462 additional data available.  
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## 485 REFERENCES

- 486 1. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al.  
487 Interventions for preventing obesity in children. *Cochrane Database Syst Rev*  
488 2011;12:CD001871.
- 489 2. Reinehr T, Kleber M, Lass N, Toschke AM. Body mass index patterns over 5 y in obese  
490 children motivated to participate in a 1-y lifestyle intervention: age as a predictor of  
491 long-term success. *Am J Clin Nutr* 2010;91(5):1165-71.
- 492 3. Danielsson P, Svensson V, Kowalski J, Nyberg G, Ekblom O, Marcus C. Importance of age  
493 for 3-year continuous behavioral obesity treatment success and dropout rate. *Obes*  
494 *Facts* 2012;5(1):34-44.
- 495 4. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight  
496 status of children: a metasynthesis of the current research. *J Am Acad Nurse Pract*  
497 2009;21(3):160-6.
- 498 5. Parry LL, Netuveli G, Parry J, Saxena S. A systematic review of parental perception of  
499 overweight status in children. *J Ambul Care Manage* 2008;31(3):253-68.
- 500 6. Towns N, D'Auria J. Parental perceptions of their child's overweight: an integrative review  
501 of the literature. *J Pediatr Nurs* 2009;24(2):115-30.
- 502 7. Regber S, Novak M, Eiben G, Bammann K, De Henauw S, Fernandez-Alvira JM, et al.  
503 Parental perceptions of and concerns about child's body weight in eight European  
504 countries--the IDEFICS study. *Pediatr Obes* 2013;8(2):118-29.
- 505 8. Lundahl A, Kidwell KM, Nelson TD. Parental underestimates of child weight: a meta-  
506 analysis. *Pediatrics* 2014;133(3):e689-703.
- 507 9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-  
508 income mothers worry about their preschoolers being overweight? *Pediatrics*  
509 2001;107(5):1138-46.
- 510 10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of  
511 health status and play activities in parents of overweight Hispanic toddlers and  
512 preschoolers. *Fam Community Health* 2005;28(2):130-41.
- 513 11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental  
514 perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes*  
515 *(Lond)* 2011;35(7):953-62.
- 516 12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding  
517 healthy behaviours for preventing overweight and obesity in young children: a  
518 systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
- 519 13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al.  
520 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
521 2009(1):CD001872.
- 522 14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of  
523 Nutrition and Dietetics: interventions for the prevention and treatment of pediatric  
524 overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
- 525 15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary  
526 school children. *Int J Eat Disord* 1999;25(3):263-71.
- 527 16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body  
528 dissatisfaction and unhealthy eating patterns in preschool children: A Delphi  
529 consensus study. *Body Image* 2014;11(4):418-25.
- 530 17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in  
531 body weight of German children reverse direction between the ages of 2 and 6 years. *J*  
532 *Nutr* 2003;133(3):789-96.



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2  
3 533 18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity  
4 534 among young U.S. children living in low-income families, 2008-2011. *Pediatrics*  
5 535 2013;132(6):1006-13.  
6 536 19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development  
7 537 of socioeconomic inequalities in obesity among Dutch pre-school and school-aged  
8 538 children *Obesity (Silver Spring)* 2014;In press  
9 539 20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions  
10 540 for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.  
11 541 21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al.  
12 542 Strategies for Recruitment and Retention of Families from Low-Income, Ethnic  
13 543 Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child  
14 544 Weight. *Child Health Care* 2013;42(3):198-213.  
15 545 22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse  
16 546 analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.  
17 547 23. Braun V, Clarke V. Using thematic analysis in psychology. . *Qualitative Research in*  
18 548 *Psychology* 2006;3(2):77-101.  
19 549 24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with  
20 550 data saturation and variability. *Field Methods* 2006;18(1):59-82.  
21 551 25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. .  
22 552 *World Health Organ Tech Rep Ser*, 2000:1-253.  
23 553 26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al.  
24 554 CDC growth charts: United States. *Adv Data* 2000(314):1-27.  
25 555 27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000  
26 556 CDC Growth Charts for the United States: methods and development. *Vital Health*  
27 557 *Stat II* 2002(246):1-190.  
28 558 28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child  
29 559 and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.  
30 560 29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull*  
31 561 2007;133(4):557-80.  
32 562 30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*  
33 563 2009;17(5):941-64.  
34 564 31. Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and  
35 565 strategies when helping their overweight children lose weight. *Qual Health Res*  
36 566 2013;23(10):1333-43.  
37 567 32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old  
38 568 girls. *Pediatrics* 2001;107(1):46-53.  
39 569 33. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family  
40 570 weight talk and dieting: how much do they matter for body dissatisfaction and  
41 571 disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.  
42 572 34. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents'  
43 573 perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.  
44 574 35. Warschburger P, Kroller K. Maternal perception of weight status and health risks  
45 575 associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.  
46 576 36. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about their  
47 577 child's weight: distinguishing facts from values. *Child Care Health Dev*  
48 578 2013;39(5):722-7.  
49 579 37. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al. Changes  
50 580 in lipidemia during chronic care treatment of childhood obesity. *Child Obes*  
51 581 2012;8(6):533-41.

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3 582 38. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb musculoskeletal  
4 583 health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.  
5 584 39. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et al.  
6 585 Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr*  
7 586 2008;152(4):489-93.  
8 587 40. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J*  
9 588 *Public Health* 2010;100(6):1019-28.

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590 Table 1. Questions included in this study.

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- 18 592 1. Do you think that how much a child weighs matters? If yes, why? If not, why?  
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20 593 2. How much do you think that a child's weight is possible to control/controllable?  
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22 594 If *yes*, what lifestyle choices do you think are the most important? How/when do you  
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24 595 think they can be promoted, and who do you think can do that? And who in the family  
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26 596 plays the most important role when it comes to influencing the child's weight?  
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28 597 If *no*, what makes you think that way?  
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30 598 3. What do you think about your child's (or grandchild's) weight? (As compared to  
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32 599 his/her siblings, cousins, other children, to the child's parents. Are you concerned/not  
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34 600 concerned?)  
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36 601 4. What do you think that the parents of your grandchild think about your grandchild's  
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38 602 weight (or grandparents of your child about your child's weight)? (Examine: If there  
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40 603 are two parents (grandparents) in the house, do they have the same opinion?)  
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42 604 5. Do you talk about your child (grandchild's) weight with his/her grandparents  
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44 605 (parents)? (If yes, why, how? If not, why? Examine: If there are two parents in the  
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46 606 house, which of them do you talk the most with and why?)  
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48 607 6. Do you know if your child (grandchild) thinks about his/her weight? (Probe: Does  
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50 608 he/she ever comment on it? Did that happen in your presence? If yes, what did you  
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52 609 say? If your child doesn't think about his/her weight, is it good or bad?)  
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611 Table 2. Descriptive statistics of the sample

	Child (n=16)	Parent (n=22)	Grandparent (n=27)
Age (mean in years, range)	4.6 (3.1-5.7)	32.2 (22.7-49.5)	56.9 (43.0-77.9)
Gender:			
Female	8 (50%)	14 (64%)	21 (78%)
Male	8 (50%)	8 (36%)	6 (22%)
Racial background:			
Euro-American/Caucasian	11 (68%)	21 (95%)	23 (84%)
Native American	0	1 (5%)	0
Asian	0	0	1 (4%)
African-American	0	0	1 (4%)
Mixed	5 (32%)	0	2 (8%)
BMI (mean, range)	17.7 (14.3-21.5)	26.8 (16.1-39.1)	29.1 (16.1-49.4)
Weight status:			
Underweight	0	2 (9%)	1 (3%)
Normalweight	7 (44%)	8 (36%)	8 (30%)
Overweight	4 (25%)	6 (27%)	10 (37%)
Obese	5 (31%)	6 (27%)	8 (30%)
Highest school grade completed	n/a		
High school		8 (82%)	20 (74%)
College/University		4 (18%)	7 (26%)
Working situation	n/a		
Full time		7 (32%)	8 (30%)
Part time		4 (18%)	4 (15%)

Not employed*		11 (50%)	15 (55%)
Annual household income	n/a		
Less than 14,999 USD		8 (36%)	7 (26%)
15,000-24,999 USD		6 (27%)	6 (22 %)
25,000 – 39,999 USD		4 (18%)	6 (22 %)
More than 40, 000 USD		4 (18%)	8 (30 %)

612 \* The main reasons for unemployment among parents were child care, pursuing higher  
 613 education, and not finding work; among grandparents, unemployment was due to not finding  
 614 work, reaching retirement age, or retiring due to health issues.

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617 Table 3. Examples of participants' quotes on perceptions of young children's body sizes.

618 Table Legends: Gp# - family group number; P - parent; G – grandparent.

619 \* = parent/grandparent of child with normal weight

620 \*\* = parent/grandparent of child with overweight

621 \*\*\* = parent/grandparent of child with obesity

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***Theme 1: Young children are 'pudgy' or 'big for their age', but not obese***

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...) But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never been concerned about her weight.

***Theme 2: 'Baby fat' is cute and healthy***

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

***Theme 3: Children go through 'growth spurts' and 'stretching out'***

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

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625 Table 4. Examples of participants' quotes on perceptions of the timeline of obesity.

626 Table Legends: Gp# - family group number; P - parent; G – grandparent.

627 \* = parent/grandparent of child with normal weight

628 \*\* = parent/grandparent of child with overweight

629 \*\*\* = parent/grandparent of child with obesity

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<b><i>Theme 4: A high body weight becomes problematic later in childhood</i></b>	
4.3 Gp01G1 (Father's mother) ***:	I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.
4.4 Gp01P1 (Father) ***:	at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.
4.6 Gp13P1 (Mother) ***:	I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."
4.8 Gp13G1 (Mother's mother) ***:	[His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.
<b><i>Theme 5: Children's body weight becomes problematic when it affects their activities or health</i></b>	
5.1 Gp03P1 (Mother) ***:	I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.
5.2 Gp11P1 (Mother) ***:	Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.
5.6 Gp01P1 (Father) ***:	I think if they are happy within themselves and they're being active, I don't think it's really a concern.
<b><i>Theme 6: Obesity becomes problematic in adulthood</i></b>	
6.3 Gp02P1 (Father) *:	You're setting the foundation for what your body's going to be like as an adult.
6.6 Gp13G2 (Mother's father) ***:	I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. <i>Why?</i> Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.
6.8 Gp16G1 (Father's mother) ***:	I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole

life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

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For peer review only

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633 Table 5. Examples of participants' quotes on perceptions of parental responsibility and blame  
634 for childhood obesity.

635 Table Legends: Gp# - family group number; P - parent; G – grandparent.

636 \* = parent/grandparent of child with normal weight

637 \*\* = parent/grandparent of child with overweight

638 \*\*\* = parent/grandparent of child with obesity

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***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

***Theme 8: The parents of obese children are blamed by themselves and by others***

8.1 Gp042 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.

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642 Table 6. Examples of participants' quotes on perceptions of appropriate contexts for speaking  
643 about preschoolers' body weights.

644 Table Legends: Gp# - family group number; P - parent; G – grandparent.

645 \* = parent/grandparent of child with normal weight

646 \*\* = parent/grandparent of child with overweight

647 \*\*\* = parent/grandparent of child with obesity

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***Theme 9: Parents and grandparents discuss preschoolers' body weights with them only when the children raise the topic***

9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".

9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.

9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".

***Theme 10: It's acceptable to discuss how big or strong preschoolers are.***

10.2 Gp12G3 (Father's mother) \*\*\*: We talk about how fit he is. He's a very fit child.

10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, "Yeah, look at his muscles".

10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

***Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively***

11.2 Gp03P2 (Father) \*\*\*: By far I don't think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father's mother) \*\*\*: I wouldn't sit with an iron fist and say, "You can't have that because it will make you fat." Because that affects their mental (wellbeing).

11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.

11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much because I do think that girls get set up in this world to worry a lot about that and that it could lead to some problems.

***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

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3 12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a  
4 bit, personally, but I don't know because I haven't asked her.  
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6 12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the  
7 parents] – I am not sure they consider it an issue yet.  
8

9 12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that  
10 because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.  
11

12 12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's  
13 weight]. (*Interviewer: Not with [her husband]?*) Um, [my daughter] and I have a closer, more  
14 intimate [connection], like [we can] talk about that kind of thing.  
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1 | “A ~~little~~ Little on the ~~heavy~~ Heavy ~~side~~ Side”: A Qualitative Analysis of Parents’ and  
2 Grandparents’ Perceptions of Preschoolers’ Body Weights

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4 Karin Eli <sup>1</sup>, DPhil, Kyndal Howell <sup>2</sup>, BS, Philip A. Fisher, PhD <sup>2</sup>, Paulina Nowicka, PhD <sup>1,3</sup>

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7 **Abstract**  
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10 **OBJECTIVES:** Parents' difficulties in perceiving children's weight status accurately pose a  
11 barrier for family-based obesity interventions; however, the factors underlying weight  
12 misinterpretation still need to be identified. This study's objective was to examine parents and  
13 grandparents' perceptions of preschoolers' body sizes. Interview questions also explored  
14 perceptions of parental responsibility for childhood obesity and appropriate contexts in which  
15 to discuss preschoolers' weights.  
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18 **DESIGN:** Semi-structured interviews, which were videotaped, transcribed, and analyzed  
19 qualitatively.  
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21 **SETTING:** Eugene and the Springfield metropolitan area, Oregon, USA  
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23 **PARTICIPANTS:** Families of children aged 3-5 years were recruited in February – May  
24 2011 through advertisements about the study, published in the job seekers' sections of [a](#)  
25 [classified website](#) (Craigslist) and [in a](#) local newspapers. 49 participants (22 parents and 27  
26 grandparents, 70% women, 60% with overweight/obesity) from sixteen low-income families  
27 of children aged 3-5 years (50% girls, 56% with overweight/obesity) were interviewed.  
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29 **RESULTS:** There are important gaps between clinical definitions and lay perceptions of  
30 childhood obesity. While parents and grandparents were aware of their preschoolers' growth  
31 chart percentiles, these measures did not translate into recognition of children's overweight or  
32 obesity. The participants spoke of obesity as a problem that may affect the children in the  
33 future, but not at present. Participants identified childhood obesity as being transmitted from  
34 one generation to the next, and stigmatized it as resulting from 'lazy' parenting. Parents and  
35 grandparents avoided discussing the children's weights with each other and with the children  
36 themselves.  
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**CONCLUSIONS:** The results suggest that clinicians should clearly communicate with parents and grandparents about the meaning and appearance of obesity in early childhood, as well as counteract the social stigma attached to obesity, in order to improve the effectiveness of family-based interventions to manage obesity in early childhood.

For peer review only

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**Strengths and limitations of this study**

- This study's sample is the largest ever reported in a qualitative investigation of family members' perceptions of preschoolers' body weights.
- While most previous studies focused only on mothers' perceptions of their preschoolers' body weights, this study included mothers, fathers, grandmothers, and grandfathers, recognizing that various adult family members influence young children's body image, eating, and exercise habits.
- Although low-income participants tend to be difficult to reach, the study successfully recruited a predominantly low-income sample.
- The sample primarily consisted of families of Caucasian origin, and thus did not allow for an investigation of the influence of cultural background on perceptions of children's body sizes.
- As several participants were single mothers, the number of fathers was not high enough to enable an assessment of potential differences between fathers' and mothers' perceptions.



## 66 INTRODUCTION

67  
68 While there is growing evidence of the superior effectiveness of lifestyle interventions  
69 initiated early in childhood<sup>1-3</sup>, one of the main barriers in conducting such interventions is  
70 parents' lack of recognition of, or concern about, obesity in children. Parents' difficulties in  
71 perceiving children's body sizes accurately have been demonstrated since the early 2000s,  
72 across many countries, cultures and child ages<sup>4-6</sup>. A recent study of over 16,000 children aged  
73 2-9 years from eight European countries has shown that, among parents of overweight  
74 children, 63% perceived their children's weights as 'proper', independent of educational  
75 level<sup>7</sup>. Moreover, a meta-analysis of 69 studies on parental perceptions of children's body  
76 weights showed that half of the parents underestimated their children's weight.<sup>8</sup>

77  
78 Most studies have applied a quantitative approach to describe parents' miscategorization of  
79 children's weight status; however, the underlying factors have not been identified  
80 conclusively<sup>6</sup>. To date, only two studies<sup>9 10</sup> have used in-depth interviews to examine how  
81 parents make sense of children's body weights and their health implications. In their study of  
82 low income mothers, Jain et al have shown that most mothers did not worry about their  
83 children's body weights if the children were active and socially accepted; the mothers,  
84 moreover, distrusted pediatric growth charts, and attributed childhood obesity to genetics,  
85 rather than to factors modifiable in the home environment<sup>9</sup>. Misinterpretation of growth  
86 charts was also highlighted by Rich et al, who found that 80% of parents perceived their child  
87 as healthy although the child's weight was at the 95<sup>th</sup> percentile. These parents, notably, were  
88 aware of obesity related health risks<sup>10</sup>. More recently, focus groups revealed that, in assessing  
89 their children's body sizes, parents tend not to rely on clinical measurements; rather, they

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90 often compare their children visually to other children whose body sizes can be defined as  
91 extreme, thus skewing their perceptions of what a healthy body size is<sup>11</sup>.

92  
93 So far, existing research on parental perceptions of children's body weights has focused  
94 almost exclusively on mothers, and has not examined the critical influence of other family  
95 members, such as fathers and grandparents<sup>12</sup>. Because family-based interventions have been  
96 proposed as the most effective approach to treating child obesity<sup>13,14</sup>, knowledge about how  
97 other adult caretakers perceive and discuss young children's body weights will contribute to  
98 understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-  
99 judgmental communication about children's eating practices and body sizes is important for  
100 the prevention of body dissatisfaction and disordered eating in childhood and adolescence<sup>15,16</sup>.

101 To examine caretakers' perceptions of young children's body weights from a broader familial  
102 perspective, we designed this study to include family sets of parents and grandparents actively  
103 involved in taking care of preschool age children. While investigating communication about  
104 food and physical activity among parents and grandparents of preschoolers was the main aim  
105 of the study, the participants' perceptions of children's body weights were essential to the  
106 study. All participants answered several questions about this topic, resulting in rich and  
107 unique material. Given this, we found that this topic merited dedicated discussion, apart from  
108 the larger study. As childhood obesity remains high among families with low socioeconomic  
109 status<sup>17-19</sup>, and as it is more difficult to recruit and retain these families in intervention  
110 programs<sup>20,21</sup>, we chose to target a low income population.

## 112 METHODS

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7 114 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield  
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9 115 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements  
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11 116 about the study, published in a local newspaper and the volunteers' and job seekers' sections  
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13 117 of Craigslist (the most widely used classified advertisement website in the United States). The  
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15 118 active involvement of grandparents in family life (defined as spending time with the  
16  
17 119 grandchild at least twice a month) was the primary criterion for inclusion in the study.  
18  
19 120 Consequently, only families in which at least one parent and one grandparent were willing to  
20  
21 121 be interviewed were included in the study. The other inclusion criteria specified that the  
22  
23 122 child's age must be between 3-5 years, and that the child should have no underlying medical  
24  
25 123 condition or disability which would affect his/her weight. All families who contacted the  
26  
27 124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.  
28  
29 125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.  
30  
31 126 When the participants first met with the researchers, and before the interviews took place, the  
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33 127 researchers verbally explained the informed consent forms to each participant, and answered  
34  
35 128 any questions participants had. If the parents/grandparents agreed to participate, they were  
36  
37 129 asked to read and sign the written project description and project consent forms. The families  
38  
39 130 received a copy of the written study description and informed consent forms.  
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43 132 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.  
44  
45 133 Free child care was provided on site, and the children were not present during the interviews.  
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47 134 Each interviewed participant received compensation of \$50 for participating in the study.  
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49 135 Prior to the interview, parents and grandparents completed a comprehensive  
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51 136 sociodemographic questionnaire routinely used in research projects involving families at the  
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53 137 Oregon Social Learning Center; the questionnaire included items concerning family  
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55 138 composition, parental education, employment status, and living conditions. All the  
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7 139 interviewed parents and grandparents as well as the preschooler in focus had their height and  
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9 140 weight measured, without shoes and wearing only light clothing, by trained research staff  
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11 141 prior to the interviews. ~~The weight status using height and weight was not calculated prior the~~  
12  
13 142 ~~interview, thus the interviewer and the family members were not informed about the child's or~~  
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15 143 ~~family members' weight status.~~ The interviews, which were conducted by a single researcher  
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17 144 (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of  
18  
19 145 family members in shaping a child's lifestyle. Before coding, all participant names were  
20  
21 146 changed to ensure confidentiality.  
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23 147

24 148 This paper focuses on the parents' and grandparents' perceptions of young children's body  
25  
26 149 weights, with particular emphasis on overweight and obesity, parental responsibility for  
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28 150 childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body  
29  
30 151 weights. The main questions are summarized in Table 1. ~~were: (1) Do you think that how~~  
31  
32 152 ~~much a child weighs matters? If yes, why? If not, why? (2) How much do you think that a~~  
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34 153 ~~child's weight is possible to control/controllable? If yes, what lifestyle choices do you think~~  
35  
36 154 ~~are the most important? How/when do you think they can be promoted, and who do you think~~  
37  
38 155 ~~can do that? And who in the family plays the most important role when it comes to~~  
39  
40 156 ~~influencing the child's weight? If no, what makes you think that way? (3) What do you think~~  
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42 157 ~~about your child's (or grandchild's) weight? As compared to his/her siblings, cousins, other~~  
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44 158 ~~children, to the child's parents. Are you concerned/not concerned? (4) What do you think that~~  
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46 159 ~~the parents of your grandchild think about your grandchild's weight (or grandparents of your~~  
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48 160 ~~child about your child's weight)? Examine: If there are two parents (grandparents) in the~~  
49  
50 161 ~~house, do they have the same opinion? (5) Do you talk about your child (grandchild's) weight~~  
51  
52 162 ~~with his/her grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two~~  
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54 163 ~~parents in the house, which of them do you talk the most with and why? (6) Do you know if~~  
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7 164 ~~your child (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it?~~

8 165 ~~Did that happen in your presence? If yes, what did you say? If your child doesn't think about~~

9 166 ~~his/her weight, is it good or bad?~~

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14 168 *Insert Table 1 here.*

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18 170 It should be noted that while all participants were asked the same main questions, the  
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20 171 interview process allowed for fluidity, and follow-up questions were adapted according to  
21  
22 172 each participant's responses. Additionally, while the majority of data directly refer to the main  
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24 173 questions listed, the present analysis includes pertinent comments the participants made  
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26 174 throughout the interviews. The interviews were videotaped and transcribed in full;  
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28 175 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this  
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30 176 paper, transcript sections that related to the main questions were extracted and collated. The  
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32 177 transcripts were then coded independently by the first and the last author, using a thematic  
33  
34 178 discourse analysis approach. Discourse analysis is concerned with people's use of language to  
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36 179 describe and make sense of their realities, and is an appropriate approach for qualitative  
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38 180 studies that examine people's definitions of and spoken attitudes towards health issues<sup>22</sup>.  
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40 181 Thematic analysis facilitates the identification of patterns in qualitative data, and therefore  
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42 182 allowed the researchers to delineate themes across the data set<sup>23</sup>. Over several in-person  
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44 183 meetings and email correspondence, the two coders compared and discussed their codes, to  
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46 184 examine and resolve potential disagreements, and reach consensus on the clustering of codes  
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48 185 into themes and on the grouping of themes under thematic categories.

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51 187 **RESULTS**

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7 188 In total, 49 family members (70% female) from sixteen families were interviewed. The  
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9 189 sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation  
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11 190 <sup>24</sup>. Seven families consisted of single parent with sole responsibility for the child (five single  
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13 191 mothers and two single fathers). In ten families, only one grandparent was interviewed; in two  
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15 192 families, two grandparents were interviewed; in three families, three grandparents were  
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17 193 interviewed; and in one family, four grandparents were interviewed. In five of the families, all  
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19 194 grandparents who had contact with the grandchild were interviewed. The most common  
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21 195 reason for not being able to include full sets were the other grandparents' residing outside the  
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23 196 study area.  
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26 198 Participants' characteristics are summarized in Table 12. All data refer to parents and  
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28 199 grandparents who were interviewed as part of the study. Due to the targeted recruitment  
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30 200 process (ads in job advertisement sections) the sample displayed low levels of education and  
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32 201 income; as many as 50% of parents were unemployed. The majority of children, parents and  
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34 202 grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific  
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36 203 Northwest.  
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39 205 All the interviewed parents and grandparents as well as the preschooler in focus had their  
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41 206 height and weight measured, without shoes and wearing only light clothing, by trained  
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43 207 research staff prior to the interviews. These measurements were taken in order to  
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45 208 contextualize the participants' stated perceptions of and attitudes toward childhood  
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47 209 overweight/obesity and associated lifestyle factors. [In most cases, the researcher who took the](#)  
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49 210 [participants' weight and height measurements also interviewed them. However, this did not](#)  
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51 211 [influence the study. The as the](#) participants' and the children's BMI statuses were not  
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53 212 calculated prior to the interviews, so as not to bias the interview process. Thus, the  
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7 213 interviewers and the participants were not informed about the child's or any of the adult  
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9 214 family members' weight status. [The interviewers were informed about the participants' and](#)  
10 215 [the children's weight statuses following the interviews; the participants were not informed](#)  
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12 216 [about their own or their children's weight statuses.](#) More than half of parents and two thirds of  
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14 217 grandparents had overweight or obesity, according to World Health Organization criteria<sup>25</sup>. Of  
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16 218 the children, 56% were either overweight or obese (overweight: 85<sup>th</sup> percentile < Body Mass  
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18 219 Index (BMI) < 95th percentile; obesity: BMI ≥ 95th percentile)<sup>26-28</sup>; those five who were  
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20 220 categorized as obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their  
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22 221 BMI.

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26 223 *Insert Table ~~1~~2 here.*  
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29  
30 225 The analysis yielded twelve major themes, clustered under four thematic categories:

31 226 Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions  
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33 227 of parental responsibility and blame for childhood obesity, and perceptions of appropriate  
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35 228 contexts for speaking about preschoolers' body weights. ~~While the number of fathers was not~~  
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37 229 ~~high enough to enable an assessment of differences between fathers' and mothers' perceptions~~  
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39 230 ~~and attitudes, there did not appear to be gender differences in participants' accounts.~~  
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41 231 ~~Furthermore, no generational differences were observed between the parents' and the~~  
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43 232 ~~grandparents' perceptions of their preschoolers' body sizes.~~ While the number of fathers was  
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45 233 ~~not high enough to enable an assessment of differences between fathers' and mothers'~~  
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47 234 ~~perceptions and attitudes, it is possible to say that the participants' responses were consistent~~  
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49 235 ~~across the sample, and no generational differences were observed between the parents' and~~  
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51 236 ~~the grandparents' perceptions of their preschoolers' body sizes.~~ Examples of participant  
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53 237 quotes from each of the thematic categories and their constituent themes are presented in table



238 | format (Tables ~~23-56~~). The complete sets of pertinent participant quotes are provided as  
239 | supplemental material (Supplementary Tables 1-4).

241 | *Insert Tables ~~23-56~~ here.*

### 244 | **Perceptions of young children's body sizes (Table ~~23~~)**

245 | None of the participants used the words 'obese' or 'overweight' to describe the preschoolers  
246 | ~~who were later identified whom the growth charts defined~~ as such. The participants used a  
247 | range of words to describe the body sizes of these preschoolers, including 'pudgy', 'chunky',  
248 | 'solid', 'stout', 'chubby', 'stocky', 'big boned', and 'robust'. Several participants described  
249 | the preschoolers as 'tall' and/or 'big for their age'. Notably, even the father of the heaviest  
250 | child in the sample (99<sup>th</sup> percentile) described his child as 'a little on the heavy side'. Across  
251 | the sample, including the parents and grandparents of normal weight children, the participants  
252 | spoke of 'baby fat' as cute and healthy, and even as something to encourage. A few  
253 | participants also spoke of children's higher percentiles on the growth charts (>90<sup>th</sup> percentile)  
254 | in positive terms. The parents and grandparents of the overweight or obese preschoolers said  
255 | their body weight was not worrisome because children go through 'growth spurts' and 'stretch  
256 | out', such that their current excess weight will eventually convert into height.

### 258 | **Perceptions of the timeline of obesity (Table ~~34~~)**

259 | The participants spoke of obesity as a problem that may affect the preschoolers in the future,  
260 | but not at present. Several participants indicated that a high body weight becomes problematic  
261 | when the child reaches school age, particularly due to the risk of teasing, social exclusion, and  
262 | bullying. Participants also said that a high body weight becomes problematic when it

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7 263 negatively affects the child's health, activities, behaviors, or mood. However, only one  
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9 264 participant, whose child was in the 99<sup>th</sup> percentile for weight, said that she could notice the  
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11 265 detrimental effects of the child's body weight at present. Thus, even when speaking of obesity  
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13 266 in terms of impact on activity and health, the participants placed it outside the remit of the  
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15 267 preschoolers' current experience. Participants also spoke of obesity as problematic due to its  
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17 268 manifestations in adulthood, expressing that children's body weights and their eating and  
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19 269 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing]  
20  
21 270 more trouble as an adult'.  
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23 271

#### 24 272 | **Perceptions of parental responsibility and blame for childhood obesity (Table 45)**

25  
26 273 The participants identified parents as bearing primary responsibility for their children's eating  
27  
28 274 and exercise habits and for their body weights. Even those participants who spoke of body  
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30 275 size as being affected by genetics asserted that parents can still influence their children's body  
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32 276 weights. Likewise, participants who mentioned that children may be overweight or obese due  
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34 277 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making  
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36 278 sure the child's medical problem is identified and resolved. The participants argued that  
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38 279 parents are responsible for children's body weights because they can control what their  
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40 280 children eat, provide a healthy food environment at home, encourage their children to play  
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42 281 outside and be active, and model healthy behaviors themselves.  
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45 283 The participants' concepts of parental responsibility linked with their attitudes towards  
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47 284 parental blame for childhood obesity. Several participants said they 'judged' parents whose  
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49 285 children were obese; some even said that the parents of obese children were guilty of child  
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51 286 neglect or abuse. Participants identified childhood obesity as being transmitted from one  
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53 287 generation to the next, and as the result of 'lazy' parenting. Having an obese child was an  
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288 outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling  
289 blamed by clinicians for the child’s weight gain, which, as she said, neither she nor the child’s  
290 clinicians could explain.

### 293 Perceptions of appropriate contexts for speaking about preschoolers’ body weights

#### 294 (Table 56)

295 The participants described discussions of preschoolers’ body weights as sensitive, often  
296 unnecessary, and potentially dangerous. The decision to engage in discussion about children’s  
297 body weights was context dependent. Participants said they discussed their children’s or  
298 grandchildren’s body weights with them only if the children themselves raised the topic.  
299 Those participants whose preschoolers did not mention body weight said they had never  
300 discussed the issue with them. Several participants said that children of preschool age do not  
301 have body image concepts related to weight. Some participants cited their preschoolers’  
302 ‘apparent ‘comfort’ with – or lack of self-consciousness about – their bodies as signaling a  
303 lack of concern with body image. A number of participants also said they avoided discussions  
304 of their preschoolers’ body weights because these discussions could be harmful to the  
305 children’s self-esteem and emotional wellbeing.

307 Notably, ~~excepting the parents of the two children with the height weight statuses,~~ all parents,  
308 ~~with the exception of two,~~ avoided discussing their children’s body weights not only with the  
309 children themselves, but also with the children’s grandparents; likewise, excepting one  
310 grandmother, all grandparents avoided discussing their grandchildren’s body weights with the  
311 parents. Participants described these discussions as unnecessary when body weight was ‘not  
312 an issue’. It was only when a child’s body weight was perceived as problematic (in the case of

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7 313 the largest child in the sample) that parents and grandparents said they openly discussed it  
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9 314 with each other. However, while most participants said they did not discuss body weights,  
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11 315 they identified comments on children's 'healthy' appearance, growth, or muscle definition as  
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13 316 appropriate and positive. Thus, although participants were reluctant to discuss the  
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15 317 preschoolers' body weights, they did discuss the preschoolers' body sizes, with attention to  
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17 318 how 'big' or 'strong' they were.  
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## 22 321 **DISCUSSION**

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26 323 This study's findings suggest that the parents and grandparents of preschool age children face  
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28 324 difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous  
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30 325 research has found that low income mothers are not concerned about preschoolers'  
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32 326 overweight because they attribute body weight to genetic heredity<sup>9</sup>. However, in this study,  
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34 327 the participants strongly endorsed the idea that parents bear primary responsibility for their  
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36 328 children's eating and exercise habits and body weights. Nevertheless, the participants did not  
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38 329 speak of their own children or grandchildren as overweight or obese. Notably, the  
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40 330 participants' responses were consistent across the sample, and no generational differences  
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42 331 were observed between the parents' and the grandparents' perceptions of their preschoolers'  
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44 332 body sizes.  
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47 334 Although the participants recognized obesity in general as a problem, they normalized their  
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49 335 own children's and grandchildren's excess body weight as 'toddler pudge' or 'cute baby fat'.  
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51 336 Like Jain et al<sup>9</sup>, the authors of the present study suggest that most participants used these  
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53 337 words not as euphemisms, as underscored by the participants' consistent descriptions of  
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7 338 children's higher body weights in positive terms – as 'cute' or 'healthy'. While participants  
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9 339 said that preschoolers' body weights would be problematic if the child became 'visibly  
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11 340 overweight', it was less clear how a 'visibly overweight' preschooler might look. The  
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13 341 participants' discussions focused, instead, on signs that might negate 'visible overweight' in a  
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15 342 preschooler, including tallness, muscularity, and physical strength. As noted by Jones et al<sup>11</sup>,  
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17 343 when participants described obesity, it was through extreme cases of morbid obesity in later  
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19 344 childhood or adulthood, with some citing examples of older children who were 'miniatures of  
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21 345 their parents' and contestants on *The Biggest Loser* who weighed 400 lbs. Future research  
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23 346 should explore how a 'visibly overweight' preschooler might look to parents and  
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25 347 grandparents.  
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28 349 Just as the participants visualized obesity through images of older children or adults, they also  
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30 350 spoke of obesity as a problem that might affect children later in life, but not in preschool age.  
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32 351 Participants spoke of suffering from teasing as a school age child, or from poor health as an  
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34 352 adult, as the consequences that marked obesity as a problem. While participants did say that  
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36 353 they would recognize a body weight problem if their preschoolers showed negative changes in  
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38 354 behavior, activity, and mood, they did not name immediate health risks. The participants'  
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40 355 depictions of obesity revealed a disconnect between knowledge and perception, previously  
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42 356 shown by Rich et al<sup>10</sup>. Although they were aware of their preschoolers' growth chart  
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44 357 percentiles, most participants did not link these percentiles with the categories of 'overweight'  
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46 358 and 'obesity'. Likewise, although participants were aware of the health risks associated with  
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48 359 obesity in adulthood, they did not link their preschoolers' body weights with potential  
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50 360 problems in the present tense.  
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7 362 While the participants did not associate obesity with early childhood, they did take  
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9 363 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise  
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11 364 practices. Along similar lines, however, the participants – including some whose children  
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13 365 were classified as obese –blamed parents for childhood obesity. The participants' expressions  
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15 366 of judgment toward the parents of obese children were aligned with broader social stigma  
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17 367 attached to obesity<sup>29 30</sup>. Given the participants' stigmatizing attitudes, it is not surprising that  
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19 368 they did not discuss their preschoolers' body weights with other family members. Although  
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21 369 parents and grandparents did discuss children's body sizes through comments on how 'big',  
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23 370 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were  
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25 371 classified as overweight or obese did not discuss their body weights with family members,  
26  
27 372 except when there was a perceived health problem. It is possible that, for the participants,  
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29 373 discussion of body weight threatened to expose both themselves and their children to the risk  
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31 374 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is  
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33 375 important to note that, in deciding not to discuss body weight with their preschoolers (unless  
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35 376 the children themselves raised the topic), the participants protected the children's body image  
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37 377 and self-esteem. Moreover, like the parents described by Andreassen et al<sup>31</sup>, those parents  
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39 378 who recognized their children needed to lose weight attempted to enact weight loss strategies  
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41 379 without explicitly mentioning weight. As previous studies have shown, parental comments  
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43 380 about body weight are associated with body dissatisfaction and reduced self-esteem in  
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45 381 children<sup>15 32 33</sup>, such that the participants' stance on avoiding 'weight talk' with children was  
46  
47 382 [positive. In cases where children are enrolled in clinical treatment programs for obesity](#)  
48  
49 383 [management, however, it is important that clinicians, parents, and grandparents identify](#)  
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51 384 [sensitive and supportive ways of framing the topic of body weight.](#) A recent study has  
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53 385 proposed a set of guidelines to help parents discuss body image and eating with preschool  
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55 386 aged children in a supportive way that is protective of children's self-esteem<sup>16</sup>.

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8 388 The results of this study suggest that there are important gaps between clinical definitions and  
9 389 lay perceptions of childhood obesity. While parents and grandparents are aware of their  
10 390 preschoolers' growth chart percentiles, these measures do not translate into recognition of  
11 391 young children's overweight or obesity. Without visual examples of how a preschool age  
12 392 child with overweight or obesity might look, such as sketched silhouettes or photographs at  
13 393 different weight categories<sup>34-36</sup>, parents and grandparents continue to speak of children's  
14 394 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later  
15 395 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss  
16 396 young children's body weights with the children and with one another, this might affect the  
17 397 success of clinical interventions for childhood obesity, in which children's caretakers are  
18 398 forced into a new and uncomfortable discussion.

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21 400 The clinical implications of this study include several components. In discussions with parents  
22 401 and grandparents of preschool age children, clinicians should clarify how children's fat  
23 402 distribution and body sizes typically change with age. Clinicians should also speak with  
24 403 children's caretakers about the meaning of growth chart percentiles, and provide visual  
25 404 examples of how children might look in each of the percentile categories. Moreover,  
26 405 clinicians should emphasize the immediate problems associated with obesity in early  
27 406 childhood, such as hypertension (present in more than 50% of children with obesity),  
28 407 dyslipidemia, motor skill development and orthopedic complications<sup>37-39</sup>.

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31 409 The results also suggest that the countering of stigma should be an important part of the  
32 410 clinical management of childhood obesity. Given the social stigma and blame attached to  
33 411 parents of children with obesity, parents might contest a child's obesity diagnosis and be

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7 412 reluctant to take part in interventions to manage their child's condition<sup>40</sup>. It is therefore crucial  
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9 413 that clinicians directly address stigma when they speak to parents, emphasizing that childhood  
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11 414 obesity is not the parents' fault, and that managing this condition together is a positive step.  
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13 415 Similarly, clinicians should avoid addressing parents of children with obesity in ways that  
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15 416 might make them feel guilty or judged. Finally, it is important that clinicians frame  
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17 417 discussions of children's body weights sensitively, and encourage parents and grandparents to  
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19 418 address children's eating and physical activity practices through positive words and actions,  
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21 419 without emphasizing body weight to the children themselves.  
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24 421 This study had some limitations. While the sample was the largest ever reported in a  
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26 422 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning  
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28 423 preschoolers' body weights, the families were mainly of Caucasian origin, representing the  
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30 424 ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence  
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32 425 of cultural background on perceptions of children's body sizes, which several studies have  
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34 426 identified as important<sup>5 18 30</sup>, could not be investigated. As the study targeted families of low  
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36 427 socioeconomic status, further research is needed to determine whether the results can be  
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38 428 generalized to other populations. Additionally, as several participants were single mothers, the  
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40 429 number of fathers was not high enough to enable an assessment of differences between  
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42 430 fathers' and mothers' perceptions and attitudes. Finally, while a number of families had a full  
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44 431 or nearly-full set of grandparents participating, some had only one or two grandparents  
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46 432 participating, due to circumstances such as the other grandparents' living outside the area.  
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## 49 434 CONCLUSION

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7 436 This study was the first to focus on both parents' and grandparents' perceptions of  
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9 437 preschoolers' body weights, and is the largest qualitative study to date to include a mixed  
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11 438 familial sample of adult caretakers of preschool age children, with subsamples of parents and  
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13 439 grandparents that meet data saturation standards<sup>24</sup>. The study's results demonstrate that while  
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15 440 parents and grandparents recognize childhood obesity as problematic, endorse healthy eating  
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17 441 and exercise habits, and take responsibility for children's body weights, they find it difficult  
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19 442 to recognize and discuss young children's overweight and obesity. The results suggest that  
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21 443 clinicians should clearly communicate with parents and grandparents about the meaning and  
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23 444 appearance of obesity in early childhood, as well as counteract the social stigma attached to  
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25 445 obesity, in order to improve the effectiveness of family-based interventions to manage obesity  
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27 446 in early childhood.

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#### 29 448 **ACKNOWLEDGMENTS**

30  
31 449 We thank all the participating families, as well as Eliah Prichard, Jessica Farmer, Kelly  
32  
33 450 Underwood, Bryn Shepherd and Waihan Leung, the University of Oregon students who  
34  
35 451 transcribed the interviews.

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#### 38 454 **CONTRIBUTORSHIP STATEMENT**

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40  
41 455 Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote  
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43 456 the manuscript, and approved the final manuscript as submitted.

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46 457 Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the  
47  
48 458 manuscript, and approved the final manuscript as submitted.

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51 459 Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed  
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53 460 the manuscript and approved the final manuscript as submitted.

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461 Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and  
462 supervised data collection and analysis, coded the interviews and analyzed them together with  
463 Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.

464

#### 465 **COMPETING INTERESTS**

466 We have read and understood BMJ policy on declaration of interests and declare that we have  
467 no competing interests.

468

#### 469 **FUNDING**

470 This work was supported by grants to PN from the Sweden-America Foundation, the Oregon  
471 Social Learning Center and the Marie Curie VINNMER International Qualification (2011-  
472 03443).

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#### 474 **DATA SHARING**

475 Online supplementary table S1-4 containing complete sets of pertinent participant quotes. No  
476 additional data available.

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#### 478 **REFERENCES**

- 479 1. Waters E, de Silva-Sanigorski A, Hall BJ, Brown T, Campbell KJ, Gao Y, et al.  
480 Interventions for preventing obesity in children. *Cochrane Database Syst Rev*  
481 2011;12:CD001871.
- 482 2. Reinehr T, Kleber M, Lass N, Toschke AM. Body mass index patterns over 5 y in obese  
483 children motivated to participate in a 1-y lifestyle intervention: age as a predictor of  
484 long-term success. *Am J Clin Nutr* 2010;91(5):1165-71.
- 485 3. Danielsson P, Svensson V, Kowalski J, Nyberg G, Ekblom O, Marcus C. Importance of age  
486 for 3-year continuous behavioral obesity treatment success and dropout rate. *Obes*  
487 *Facts* 2012;5(1):34-44.
- 488 4. Doolen J, Alpert PT, Miller SK. Parental disconnect between perceived and actual weight  
489 status of children: a metasynthesis of the current research. *J Am Acad Nurse Pract*  
490 2009;21(3):160-6.
- 491 5. Parry LL, Netuveli G, Parry J, Saxena S. A systematic review of parental perception of  
492 overweight status in children. *J Ambul Care Manage* 2008;31(3):253-68.

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- 493 6. Towns N, D'Auria J. Parental perceptions of their child's overweight: an integrative review  
494 of the literature. *J Pediatr Nurs* 2009;24(2):115-30.
- 495 7. Regber S, Novak M, Eiben G, Bammann K, De Henauw S, Fernandez-Alvira JM, et al.  
496 Parental perceptions of and concerns about child's body weight in eight European  
497 countries--the IDEFICS study. *Pediatr Obes* 2013;8(2):118-29.
- 498 8. Lundahl A, Kidwell KM, Nelson TD. Parental underestimates of child weight: a meta-  
499 analysis. *Pediatrics* 2014;133(3):e689-703.
- 500 9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-  
501 income mothers worry about their preschoolers being overweight? *Pediatrics*  
502 2001;107(5):1138-46.
- 503 10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of  
504 health status and play activities in parents of overweight Hispanic toddlers and  
505 preschoolers. *Fam Community Health* 2005;28(2):130-41.
- 506 11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental  
507 perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes*  
508 (Lond) 2011;35(7):953-62.
- 509 12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding  
510 healthy behaviours for preventing overweight and obesity in young children: a  
511 systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
- 512 13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al.  
513 Interventions for treating obesity in children. *Cochrane Database Syst Rev*  
514 2009(1):CD001872.
- 515 14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of  
516 Nutrition and Dietetics: interventions for the prevention and treatment of pediatric  
517 overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
- 518 15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary  
519 school children. *Int J Eat Disord* 1999;25(3):263-71.
- 520 16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body  
521 dissatisfaction and unhealthy eating patterns in preschool children: A Delphi  
522 consensus study. *Body Image* 2014;11(4):418-25.
- 523 17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in  
524 body weight of German children reverse direction between the ages of 2 and 6 years. *J*  
525 *Nutr* 2003;133(3):789-96.
- 526 18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity  
527 among young U.S. children living in low-income families, 2008-2011. *Pediatrics*  
528 2013;132(6):1006-13.
- 529 19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development  
530 of socioeconomic inequalities in obesity among Dutch pre-school and school-aged  
531 children *Obesity (Silver Spring)* 2014;In press
- 532 20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions  
533 for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.
- 534 21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al.  
535 Strategies for Recruitment and Retention of Families from Low-Income, Ethnic  
536 Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child  
537 Weight. *Child Health Care* 2013;42(3):198-213.
- 538 22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse  
539 analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
- 540 23. Braun V, Clarke V. Using thematic analysis in psychology. . *Qualitative Research in*  
541 *Psychology* 2006;3(2):77-101.

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3  
4  
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6  
7 542 24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with  
8 543 data saturation and variability. *Field Methods* 2006;18(1):59-82.
- 9 544 25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. .  
10 545 *World Health Organ Tech Rep Ser*, 2000:1-253.
- 11 546 26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al.  
12 547 CDC growth charts: United States. *Adv Data* 2000(314):1-27.
- 13 548 27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000  
14 549 CDC Growth Charts for the United States: methods and development. *Vital Health*  
15 550 *Stat 11* 2002(246):1-190.
- 16 551 28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child  
17 552 and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.
- 18 553 29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull*  
19 554 2007;133(4):557-80.
- 20 555 30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)*  
21 556 2009;17(5):941-64.
- 22 557 31. Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and  
23 558 strategies when helping their overweight children lose weight. *Qual Health Res*  
24 559 2013;23(10):1333-43.
- 25 560 32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old  
26 561 girls. *Pediatrics* 2001;107(1):46-53.
- 27 562 33. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family  
28 563 weight talk and dieting: how much do they matter for body dissatisfaction and  
29 564 disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.
- 30 565 34. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents'  
31 566 perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.
- 32 567 35. Warschburger P, Kroller K. Maternal perception of weight status and health risks  
33 568 associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.
- 34 569 36. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about their  
35 570 child's weight: distinguishing facts from values. *Child Care Health Dev*  
36 571 2013;39(5):722-7.
- 37 572 37. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al. Changes  
38 573 in lipidemia during chronic care treatment of childhood obesity. *Child Obes*  
39 574 2012;8(6):533-41.
- 40 575 38. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb musculoskeletal  
41 576 health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.
- 42 577 39. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et al.  
43 578 Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr*  
44 579 2008;152(4):489-93.
- 45 580 40. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J*  
46 581 *Public Health* 2010;100(6):1019-28.

47 582  
48 583 Table 1. Questions included in this study.

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1. Do you think that how much a child weighs matters? If yes, why? If not, why?

2. How much do you think that a child's weight is possible to control/controllable?

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7 587 If yes, what lifestyle choices do you think are the most important? How/when do you  
8 588 think they can be promoted, and who do you think can do that? And who in the family  
9 589 plays the most important role when it comes to influencing the child's weight?

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12 590 If no, what makes you think that way?

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14 591 3. What do you think about your child's (or grandchild's) weight? (As compared to  
15 592 his/her siblings, cousins, other children, to the child's parents. Are you concerned/not  
16 593 concerned?)

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18 594 4. What do you think that the parents of your grandchild think about your grandchild's  
19 595 weight (or grandparents of your child about your child's weight)? (Examine: If there  
20 596 are two parents (grandparents) in the house, do they have the same opinion?)

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22 597 5. Do you talk about your child (grandchild's) weight with his/her grandparents  
23 598 (parents)? (If yes, why, how? If not, why? Examine: If there are two parents in the  
24 599 house, which of them do you talk the most with and why?)

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26 600 6. Do you know if your child (grandchild) thinks about his/her weight? (Probe: Does  
27 601 he/she ever comment on it? Did that happen in your presence? If yes, what did you  
28 602 say? If your child doesn't think about his/her weight, is it good or bad?)

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607 Table 42. Descriptive statistics of the sample

	Child (n=16)	Parent (n=22)	Grandparent (n=27)
Age (mean in years, range)	4.6 (3.1-5.7)	32.2 (22.7-49.5)	56.9 (43.0-77.9)
Gender:			
Female	8 (50%)	14 (64%)	21 (78%)
Male	8 (50%)	8 (36%)	6 (22%)
Racial background:			
Euro-American/Caucasian	11 (68%)	21 (95%)	23 (84%)
Native American	0	1 (5%)	0
Asian	0	0	1 (4%)
African-American	0	0	1 (4%)
Mixed	5 (32%)	0	2 (8%)
BMI (mean, range)	17.7 (14.3-21.5)	26.8 (16.1-39.1)	29.1 (16.1-49.4)
Weight status:			
Underweight	0	2 (9%)	1 (3%)
Normalweight	7 (44%)	8 (36%)	8 (30%)
Overweight	4 (25%)	6 (27%)	10 (37%)
Obese	5 (31%)	6 (27%)	8 (30%)
Highest school grade completed	n/a		
High school		8 (82%)	20 (74%)
College/University		4 (18%)	7 (26%)
Working situation	n/a		
Full time		7 (32%)	8 (30%)
Part time		4 (18%)	4 (15%)



Not employed*		11 (50%)	15 (55%)
Annual household income	n/a		
Less than 14,999 USD		8 (36%)	7 (26%)
15,000-24,999 USD		6 (27%)	6 (22 %)
25,000 – 39,999 USD		4 (18%)	6 (22 %)
More than 40, 000 USD		4 (18%)	8 (30 %)

608 \* The main reasons for unemployment among parents were child care, pursuing higher  
 609 education, and not finding work; among grandparents, unemployment was due to not finding  
 610 work, reaching retirement age, or retiring due to health issues.

613 | Table 23. Examples of participants' quotes on perceptions of young children's body sizes.

614 | Table Legends: Gp# - family group number; P - parent; G – grandparent.

615 | \* = parent/grandparent of child with normal weight

616 | \*\* = parent/grandparent of child with overweight

617 | \*\*\* = parent/grandparent of child with obesity

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**Theme 1: Young children are 'pudgy' or 'big for their age', but not obese**

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...) But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never been concerned about her weight.

**Theme 2: 'Baby fat' is cute and healthy**

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

**Theme 3: Children go through 'growth spurts' and 'stretching out'**

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

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621 | Table 34. Examples of participants' quotes on perceptions of the timeline of obesity.

622 | Table Legends: Gp# - family group number; P - parent; G – grandparent.

623 | \* = parent/grandparent of child with normal weight

624 | \*\* = parent/grandparent of child with overweight

625 | \*\*\* = parent/grandparent of child with obesity

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***Theme 4: A high body weight becomes problematic later in childhood***

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

***Theme 6: Obesity becomes problematic in adulthood***

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole

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life.  
6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.

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For peer review only

629 | Table 45. Examples of participants' quotes on perceptions of parental responsibility and  
630 | blame for childhood obesity.

631 | Table Legends: Gp# - family group number; P - parent; G – grandparent.

632 | \* = parent/grandparent of child with normal weight

633 | \*\* = parent/grandparent of child with overweight

634 | \*\*\* = parent/grandparent of child with obesity

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**Theme 7: Parents have control over children's eating, physical activity, and body weights**

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

**Theme 8: The parents of obese children are blamed by themselves and by others**

8.1 Gp042 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.

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638 | Table 56. Examples of participants' quotes on perceptions of appropriate contexts for  
639 speaking about preschoolers' body weights.

640 Table Legends: Gp# - family group number; P - parent; G - grandparent.

641 \* = parent/grandparent of child with normal weight

642 \*\* = parent/grandparent of child with overweight

643 \*\*\* = parent/grandparent of child with obesity

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***Theme 9: Parents and grandparents discuss preschoolers' body weights with them only when the children raise the topic***

9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".

9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.

9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".

***Theme 10: It's acceptable to discuss how big or strong preschoolers are.***

10.2 Gp12G3 (Father's mother) \*\*\*: We talk about how fit he is. He's a very fit child.

10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, "Yeah, look at his muscles".

10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

***Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively***

11.2 Gp03P2 (Father) \*\*\*: By far I don't think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father's mother) \*\*\*: I wouldn't sit with an iron fist and say, "You can't have that because it will make you fat." Because that affects their mental (wellbeing).

11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.

11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much because I do think that girls get set up in this world to worry a lot about that and that it could lead to some problems.

***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a bit, personally, but I don't know because I haven't asked her.

12.7 Gp01G1 (Father's mother) \*\*: I haven't yet [discussed the child's weight]. They [the parents] – I am not sure they consider it an issue yet.

12.8 Gp03P1 (Mother) \*\*: I always tell them like, "Please don't encourage this, or that because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

12.9 Gp03G1 (Mother's mother) \*\*: with [my daughter], I've talked about it [the child's weight]. (*Interviewer: Not with [her husband]?*) Um, [my daughter] and I have a closer, more intimate [connection], like [we can] talk about that kind of thing.

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## SUPPLEMENTAL MATERIAL

Supplementary Table 1. Perceptions of young children's body sizes; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

### *Theme 1: Young children are 'pudgy' or 'big for their age', but not obese*

1.1 Gp03P2 (Father) \*\*\*: Yeah, I think personally, my son is a little on the heavy side. (...)But he, in my opinion, I think he's a little on the big side, but he's also strong as an ox, so how much is muscle and fat I don't know. You know, it's hard to tell when they're that age.

1.2 Gp07G1 (Mother's mother) \*: There are going to be kids, that are just by their DNA and genetics, that are a chunkier body build, stuff like that.

1.3 Gp11G1 (Mother's mother) \*\*\*: [My granddaughter's] not small... she's not fat but she's solid. (...) I never find her overweight.

1.4 Gp13G1 (Mother's mother) \*\*\*: [My daughter] was a larger child, she was never 'obese' or fat or whatever, she was never teased or anything like that.

1.5 Gp14P1 (Mother) \*\*: I think [my daughter] has got a big frame, she has big bones.

1.6 Gp01P1 (Father) \*\*\*: but [my daughter], unfortunately... she just is blessed where she is a little chunky at parts.

1.7 GP10G4 (Father's stepmother) \*\*: But if a child is just built bigger, then you need to let that go and just realize that's how a child is made.

1.8 Gp01P1 (Mother) \*\*\*: she's also getting really tall, but I have a concern that she's getting a little pudgier (...) She's pudgy, she is a little overweight and we're working on it.

1.9 Gp03G01 (Mother's mother) \*\*\*: [My grandson] has a little bit of a weight issue.

1.10 Gp10G4 (Father's stepmother) \*\*: I think he is a short little toddler. He is a little bit round.

1.11 Gp10G1 (Father's mother) \*\*: Our middle son, when he was in 4th or 5th grade, he was a little chunky (...) He was 10.6 [lbs] when he was born and just a super stout, robust baby the minute he was born.

1.12 Gp13G2 (Mother's father) \*\*\*: He's not overweight at all, he's almost skinny, but he's tall, he's a tall kid. He's always been big and tall for his age.

1.13 Gp16P1 (Father) \*\*: I think it's just, he's a big boy, yeah they are big for their age.

1.14 Gp11G1 (Mother's mother) \*\*\*: She is a big girl. She is solid and she's like 54 pounds. (...) But we're not concerned... she's definitely not fat or overweight... the doctor has never

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been concerned about her weight.

1.15 Gp10P1 (Mother) \*\*: I think he has a good amount of weight on his bones. And he is normally big for his age.

1.16 Gp11P1 (Mother) \*\*\*: she has always been at the 90 or 100 percentile with her age group but in weight and always under in height. She has always been kind of short and stocky.

1.17 Gp03G1 (Mother's mother) \*\*\*: he's very big for his age. He's tall. People think he's six, he's only five.

### ***Theme 2: 'Baby fat' is cute and healthy***

2.1 Gp02P1 (Father) \*: she's got some cute baby fat but it's nothing to be worried about.

2.2 Gp05P2 (Father) \*: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.

2.3 Gp05P3 (Mother's mother) \*: You know, she's got that little girl pudgy on her, that's so cute. Actually, I think a couple times this past year, I thought she might be a little underweight, because she didn't seem to have that little toddler pudgy.

2.4 Gp06P1 (Mother) \*\*: I don't worry about his weight right now, it's really hard at this age because I mean all of them are kinda pudgy.

2.5 Gp07P1 (Mother) \*: She's well within range, she's got that cute little extended abdomen of a toddler, you know.

2.6 Gp10G1 (Father's mother) \*\*: our kids were always in the 95th percentile... robust kids. I think he seems very healthy.

2.7 Gp13G1 (Mother's mother) \*\*\*: I think he's in the 50th percentile for weight and over a 100th for height.

2.8 Gp14P1 (Mother) \*\*: I think she is fine, she does have a little belly, but it's not anything I would worry about or say anything. (...) I think she is healthy, I think she is just a big strong girl.

2.9 Gp10P1 (Mother) \*\*: when he got chubby when he was younger, they [grandparents] just thought it was the cutest thing. You know... they are like... they just want to pinch his cheeks.

2.10 Gp11P1 (Mother) \*\*\*: Well we kind of joke about it because my daughter's kind of got the little girl gut.

2.11 Gp01G1 (Mother's mother) \*\*\*: she does have cute little love handles.

2.12 Gp10P1 (Mother) \*\*: I just think chubbier kids are cuter. So I try to keep him a little chubby.

2.13 Gp07G1 (Mother's mother) \*: [My daughter] was the only one, like I said that [she] was in the 95th percentile. She was the only one I ever wondered about, but she was cute chubby, that I

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didn't.

***Theme 3: Children go through 'growth spurts' and 'stretching out'***

3.1 Gp10P1 (Mother) \*\*: I really liked how chubby he was. It was really nice to cuddle. And I didn't worry about that. Because I figure when he would grow, that weight would just stretch out.

3.2 Gp01P1 (Mother) \*\*\*: But I do also believe that children have hills and valleys. They are all going to grow at different rates and they going to go through the pudgy phase and then they just, you know they start doing this (makes expanding outward hand movements) and then they just grow like a tree, then they lean up.

3.3 Gp02G1 (Father's mother) \*\*\*: My son goes up and down, my 7 year-old, goes up and down in his weight...but he usually gets plump and then has a growth spurt and so then it evens out. So I don't worry too much about it.

3.4 Gp11P1 (Mother) \*\*\*: When she starts getting kind of chunky I start waiting for that growth spurt because if it doesn't hit soon I get worried and start watching what she's eating.

3.5 Gp12P2 (Father) \*\*\*: When they're growing, they grow up and they grow out.

3.6 Gp14G1 (Mother's mother) \*\*: I know sometimes kids pudge and then they stretch out.

3.7 Gp03P2 (Father) \*\*\*: by the time [my friends] graduated from high school, all of a sudden they went a foot taller, and I think all the width went to height.

3.8 Gp01P1 (Mother) \*\*\*: kids go through different phases and right now is a pudgy stage.

3.9 Gp11G1 (Mother's mother) \*\*\*: we've never been concerned when she goes through those eating phases because we know it's her growth spurt and it's not like she's gaining weight this way (out) growing this way (up).

3.10 Gp14G1 (Mother's mother) \*\*: I know when [my daughter] was in 5th grade, she got heavier, and then she stretched out in high school.

3.11 Gp06G1 (Mother's mother) \*\*: We can tell when he's about to go through a growth-spurt he gets that little teeny tummy.

Supplementary Table 2. Perceptions of the timeline of obesity; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 4: A high body weight becomes problematic later in childhood***

4.1 Gp02G1 (Father's mother) \*: I think that when you see kids that are very overweight at 5, 7 and on up, that there's something going on with their eating. I think that when you have small children, like babies, who are plump, healthy babies, that's a whole different story. But I think that when they're older there's something to it.

4.2 Gp10G2 (Father's father) \*\*: Someone with a child [my grandson's] age... he is just 3... I don't know what data shows. Is there any issue with childhood obesity at that age? I don't know. When they talk about childhood obesity, later on, because humans go through all these different growth spurts

4.3 Gp01G1 (Father's mother) \*\*\*: I think she is probably okay right now but if she continues on the growth pattern that she's going she's going to be an obese little girl and I think that's sad because kids make fun of kids when they are growing up and they're heavy.

4.4 Gp01P1 (Father) \*\*\*: at that young of an age I don't think it really matters. (...) I would say (weight matters) when they hit junior high or middle school. It probably, that's when they're, that's as a girl, as a guy I don't think we really ever care.

4.5 Gp01G1 (Mother's mother) \*\*\*: when they [obese children] get to school they're going to be teased (...) they're going to be the last ones picked for teams in school.

4.6 Gp13P1 (Mother) \*\*\*: I have one friend whose 11 year old is starting to get really chunky... my friends and I have that hard conversation with her: "(...) Look at [your son], he's going to get made fun of at school and he's starting to get really fat, and you need to watch what he's eating."

4.7 Gp15G1 (Mother's mother) \*: as he starts to enter the schooling system that [weight] isn't an additional emotional piece of baggage that he has to carry... being ostracized in the area or personally feeling like different.

4.8 Gp13G1 (Mother's mother) \*\*\*: [His mother] has a pediatrician that is particularly in-tune with larger children, and he's been able to make her aware of possible pitfalls in the future. The importance of getting in to school, getting socialized, cause he's always going to be the big kid.

***Theme 5: Children's body weight becomes problematic when it affects their activities or health***

5.1 Gp03P1 (Mother) \*\*\*: I still feel like it limits him, it makes him tired quicker, things like that. And I wish that that was not the case, I wish things were a little more effortless and things like that.

5.2 Gp11P1 (Mother) \*\*\*: Her doctor has always said that she's very healthy; she's really bright and wants to learn everything and she's still very physically active. (...) And so that has encouraged me that her weight is okay and her doctor has always said that she's just fine.

5.3 Gp05P1 (Mother) \*: if the weight is causing problems and issues in their body and ... then that's a problem.

5.4 Gp08P1 (Mother) \*: If she starts getting like, even more heavier, where I'm noticing maybe that she's depressed, or gaining weight more, or where if I see it affecting the way she looks at herself or her behavior with other kids, her activities, then I would be concerned.

5.5 Gp10P2 (Father) \*\*: If a kid is too fat to do much then it is not going to be healthy.

5.6 Gp01P1 (Father) \*\*\*: I think if they are happy within themselves and they're being active, I don't think it's really a concern.

5.7 Gp14P1 (Mother) \*\*: As long as they are healthy [weight is not an issue]; if you can visibly see that a child is overweight, and not getting enough activity, then that would matter.

### ***Theme 6: Obesity becomes problematic in adulthood***

6.1 Gp01P1 (Mother) \*\*\*: I do think that a child's weight matters. Just because you don't want them to develop unhealthy habits early because it's going to follow them for the rest of their life.

6.2 Gp01G2 (Father's mother) \*\*\*: I don't like seeing a child that age to start out being obese. It carries on with them so... I worry about healthy eating with them a little bit because of that.

6.3 Gp02P1 (Father) \*: You're setting the foundation for what your body's going to be like as an adult.

6.4 Gp06P1 (Mother) \*\*: what motivated me is looking at my child and what I want him – who I want him to be in 25 years as a young man.

6.5 Gp10G2 (Father's stepfather) \*\*: If a child is not getting proper nutrition, especially during certain critical stages, you can have all kinds of long lasting effects, and yes that does speak to weight, certainly.

6.6 Gp13G2 (Mother's father) \*\*\*: I think if they are becoming obese and overweight, and are inactive, that's not a good place to be as a child. *Why?* Because then they are probably going to have more trouble as an adult, if it's already manifesting itself at a young age.

6.7 Gp14G2 (Father's mother) \*\*: I think [weight matters] because what they learn as a child can carry on through their life. What they learn to eat.

6.8 Gp16G1 (Father's mother) \*\*\*: I think it's not just your weight as a child but it goes with you your whole life, if you struggle with weight as a child then you probably will your whole life.

6.9 Gp06P1 (Mother) \*\*: we are more concerned with lifelong patterns and habits, because... they are going to take all those habits into adulthood.



Supplementary Table 3. Perceptions of parental responsibility and blame for childhood obesity; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 7: Parents have control over children's eating, physical activity, and body weights***

7.1 Gp01P1 (Mother) \*\*\*: We're the ones that are solely responsible for their food that goes into their mouth, how much food goes onto their plate, and what their activities are. (...) If they have some thymus gland issue, or whatever, then obviously that's going to be out of your control but you're going to be looking to a doctor to get it back under control.

7.2 Gp01P1 (Father) \*\*\*: the parents and grandparents have control of what the children eat.

7.3 Gp02P1 (Father) \*: I think with proper feeding and keeping the proper foods in the house you can control the weight. If you have a bunch of snack foods and junk food all throughout the house and people sit around and watch TV and eat food, you're controlling the weight there and not in a good way – you're going to get heavier.

7.4 Gp02G1 (Father's mother) \*: I think that if you buy a lot of junk food and that's what you have: soda, chips and things like that... and that's what your child is mostly eating, and they're getting overweight from that, then yes, you have a lot of control.

7.5 Gp04G3 (Mother's mother) \*: Genetics are a factor, but not strong enough to be above food and activity levels. I think it's completely manageable no matter what if you are making it a priority and taking your kid to the doctor and following good nutrition then I think it will be an acceptable weight, unless there is a medical problem but they should be able to figure out if it's a medical problem.

7.6 Gp06G1 (Mother's mother) \*\*: Just make them [fast foods] a treat, a special treat. Not because you are tired and don't want to cook, because then that becomes too easy for them.

7.7 Gp09G1 (Mother's mother) \*: I think if you sit down and eat as a family, you're not sitting in front of the TV feeding your face, so you're going to limit the amount... you're talking so you're not eating as much.

7.8 Gp13G1 (Mother's mother) \*\*\*: Yeah, a child's weight is easy to control, if you control what goes in and out of their mouth.

7.9 Gp14P1 (Mother) \*\*: She does like to eat, you could hand her a bag of cookies and put her in front of the TV, and she might sit there all day. Or she might not, I don't know, I've never done that. I could see if some parents were lazy, that might be an easy option. I think parents have a lot of influence on the weight of the child.

7.10 Gp13P1 (Mother) \*\*\*: They (parents) need to monitor what their child's eating and make

sure they're being active.

7.11 Gp04G2 (Mother's father) \*: I see a lot of kids just go and play their computer games and TVs sitting down eating chips, and that's not the kid's fault.

7.12 Gp09P1 (Mother) \*: three year-olds should be running around, they should be active and they shouldn't be sitting on the couch eating Cheetos all day. So that's not a very healthy lifestyle and to each their own with parenting but in my personal opinion, I think it can be controlled.

7.13 Gp12G3 (Father's mother) \*\*\*: If you are active, the kids will be active. If you are into nutrition, the kids will be into nutrition.

7.14 Gp12P2 (Father) \*\*\*: There are some genetic factors. In terms of parents directing nutrition and activity, they have probably 95% control.

7.15 Gp15P1 (mother) \*: some kids will be more susceptible to gaining weight than others (...) but I think it's totally controllable what you're going to feed them.

***Theme 8: The parents of obese children are blamed by themselves and by others***

8.1 Gp04P2 (Mother) \*: Honestly, when I see kids that are incredibly overweight I think it's child abuse, it really upsets me.

8.2 Gp05G3 (Mother's mother) \*: Sometimes I see heavy parents who don't seem to exercise, and don't seem to eat right. And I see their children, and I say, "Oh my gosh, they are passing that down to the next generation."

8.3 GP10G4 (Stepmother of the father) \*\*: They [obese children] are trying to get some safety net through food because they are neglected by their parents or grandparents.

8.4 Gp13P1 (Mother) \*\*\*: If I had a fat kid, it would be looking at me every day, "I'm a failure. I'm doing something wrong."

8.5 Gp04P2 (Mother) \*: I think most adults who are overweight can probably attribute it to their parents.

8.6 Gp11P1 (Mother) \*\*\*: I hate those parents who are like, "Well, she'll only eat at McDonald's." "No! She won't. You let her only eat at McDonald's. Or you let her only eat fruit snacks."

8.7 Gp13P1 (Mother) \*\*\*: you see these kids that can barely move, and it's like how do you not be judgmental about that, because you look at the parent, and they look like a miniature of their parent.

8.8 Gp13G2 (Mother's father) \*\*\*: to me, seeing an overweight six year old, it's like what is going on here? I think it's the adults, the parents, guardians, are the ones who have the most effect on that.

8.9 Gp11G1 (Mother's mother) \*\*\*: if I were to see my child gaining weight and being lethargic



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and had no interest... [I'd] say, okay, I've messed up and I've got to fix this now... because I wouldn't want them to spend the rest of their life having to be on *The Biggest Loser* or something at 400 pounds because I was too lazy.

8.10 Gp03P1 (Mother) \*\*\*: They [medical staff] kept asking me what I was feeding him because he was getting so chubby (...) I kept thinking, "What am I doing wrong?"

For peer review only

Supplementary Table 4. Perceptions of appropriate contexts for speaking about preschoolers' body weights; the complete sets of pertinent participant quotes.

Table Legends: Gp# - family group number; P - parent; G – grandparent.

\* = parent/grandparent of child with normal weight

\*\* = parent/grandparent of child with overweight

\*\*\* = parent/grandparent of child with obesity

***Theme 9: Parents and grandparents do not discuss preschoolers' body weights with them, unless the children raise the topic***

9.1 Gp01G1 (Mother's mother) \*\*\*: And with [the child], she steps on the scale and she knows she weighs more than her brother but we've never, I've always told her, "Look at me, I'm fat, you're not fat".

9.2 Gp03P1 (Mother) \*\*\*: I have never talked to him about being heavy, but like, a few weeks ago he talked about being fat, and I don't know where he got that from, like another kid, or if he saw it on TV, I have no idea. But he is kind of aware of it, but only on kind of a surface level.

9.3 Gp13G1 (Mother's mother) \*\*\*: He knows that he's taller than most. Probably more than anything, he's probably tired of hearing that he's bigger, [he says,] "It's not my fault I'm bigger, I'm still only five years old".

9.4 Gp09P1 (Mother) \*: I don't like this but she does have a fascination with my scale—she doesn't know what the numbers mean but she likes to get on there and I'll be like, "Oh my God, you gained a pound!" and she'll get excited (...) but I think she's still too young to know what (body) image is.

9.5 Gp01G1 (Father's mother) \*\*\*: I think she is totally oblivious to it [weight] which is good in a way.

9.6 Gp02P1 (Father) \*: I don't think she's noticed any difference between the her and her sister... she's not really conscious of it yet, she is just her.

9.7 Gp10P1 (Mother) \*\*: I don't think he thinks about his weight. We never talk about it. It is almost like nonexistent, especially at his age

9.8 Gp05P3 (Mother's mother) \*: She's very comfortable with her body. (...) I think she's aware that she has a body, and that it functions. (...) But I don't think she's really aware of, "oh, I'm too skinny, I'm too fat."

9.9 Gp14P1 (Mother) \*\*: I don't think she thinks anything of it. She is comfortable walking around the house with no clothes on. I don't think she thinks anything of it, she has never said anything.

***Theme 10: It's acceptable to discuss how big or strong preschoolers are***

10.1 Gp12G2 (Father's father) \*\*\*: I can't say that it's [the child's weight] ever come up. Other

than to say that “he’s sure getting heavy”, in growing up.

10.2 Gp12G3 (Father’s mother) \*\*\*: We talk about how fit he is. He’s a very fit child.

10.3 Gp13P1 (Mother) \*\*\*: His body shape is very athletic, so we go, “Yeah, look at his muscles”.

10.4 Gp11G1 (Mother’s mother) \*\*\*: we talk about her weight and her height a lot because she’s a big girl, but not that we’re concerned.

10.5 Gp10G1 (Father’s mother) \*\*: We might have in passing commented to how healthy he seems. I mean, just something sort of innocuous and nothing really of concern.

10.6 Gp04P1 (Father) \*: We talk about how he's growing and how he weighed and checked up.

10.7 Gp04P2 (Mother) \*: He [the child] just thinks it’s a cool number. He gets excited to get weighed, “am I getting bigger?”

10.8 Gp04G3 (Mother’s mother) \*: it's been awhile since we've talked about it. We used to talk about it every time he came back from the doctor. The percentile he was in and such.

10.9 Gp16P1 (Father) \*\*: Oh we always talk about how big they are and they are always showing their muscles and stuff like that. We encourage them to eat their veggies so then they can get big muscles and then they want to show off their muscles.

10.10 Gp07G1 (Mother’s mother) \*: She’s [the child’s mother] never, that I can think has ever expressed any concern about her weight. She makes comments, like “Boy, I can tell [the child] must be going through a growth spurt.”

10.11 Gp09P1 (Mother) \*: They [grandparents] always joke and say that she looks just like Daddy because Daddy’s kind of tall and lean.

***Theme 11: Discussing preschoolers’ body weights can affect their self-esteem negatively***

11.1 Gp03P1 (Mother) \*\*\*: So when he [the child] asks me stuff like that [about his weight] we talk about being strong versus being big and not strong. So it’s all about trying to be strong and healthy so, that’s what we talk about.

11.2 Gp03P2 (Father) \*\*\*: By far I don’t think that parents should focus on it [weight] because then it will become a focal point for the child.

11.3 Gp01G1 (Father’s mother) \*\*\*: I wouldn’t sit with an iron fist and say, “You can’t have that because it will make you fat.” Because that effects their mental (wellbeing).

11.4 Gp01P1 (Mother) \*\*\*: I have a concern that she’s getting a little pudgier so I’m like, “If you’re going to do milk, please go down to the skim or 1%, lay off the juice or dilute it”, to start doing the things that she won’t notice.

11.5 Gp14G2 (Father’s mother) \*\*: I don't think a parent should badger them about their eating habits, I think there are ways to slowly and gradually make changes to lose weight rather than

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pointing it out.

11.6 Gp14G1 (Mother's mother) \*\*: I think it's dangerous to make a child conscious of their weight in some ways. Especially when it's just a healthy thing. I think it's best to not say anything.

11.7 Gp02G1 (Father's mother) \*: I probably wouldn't want to talk about her weight too much because I do think that girls get set up in this world to worry a lot about that and that it could lead to some problems.

***Theme 12: Parents and grandparents do not discuss preschoolers' body weights with each other, unless there is a perceived problem***

12.1 Gp10G1 (Father's mother) \*\*: I think she [the child's mother] over worries [about] that a bit, personally, but I don't know because I haven't asked her.

12.2 GP10G4 (Stepmother of the father) \*\*: I never talk about his [the child's] weight.

12.3 Gp06P1 (Mother) \*\*: No, I don't think she [grandmother] thinks he's at an unhealthy weight. (...) She's never said anything to me.

12.4 Gp12G3 (Father's mother) \*\*\*: I think they [the parents] should be very pleased with it [the child's weight], but I don't know.

12.5 Gp12G2 (Father's father) \*\*\*: I don't think about what his parents think about his weight. I know [his father] is certainly concerned with nutrition

12.6 Gp07P1 (Mother) \*: I think that my mom probably would think it [the child's weight] doesn't matter. (...) [I]t's never something we discuss.

12.7 Gp01G1 (Father's mother) \*\*\*: I haven't yet [discussed the child's weight]. They [the parents] – I am not sure they consider it an issue yet.

12.8 Gp03P1 (Mother) \*\*\*: I always tell them like, "Please don't encourage this, or that because I don't want him eating it if that's ok". That sort of thing. So we have talked about it.

12.9 Gp03G1 (Mother's mother) \*\*\*: with [my daughter], I've talked about it [the child's weight]. (*Interviewer: Not with [her husband]?*) Um, [my daughter] and I have a closer, more intimate [connection], like [we can] talk about that kind of thing.