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When Does Obesity Become a Problem? 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', 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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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

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 childhood¹⁻³, 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 ages⁴⁻⁶. 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 level⁷. 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.⁸

Most studies have applied a quantitative approach to describe parents' miscategorization of children's weight status; however, the underlying factors have not been identified conclusively⁶. To date, only two studies^{9 10} 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 charts⁹. 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 95th percentile. These parents, notably, were aware of obesity related health risks¹⁰. 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 is¹¹.

So far, existing research on parental perceptions of children's body weights has focused almost exclusively on mothers, not acknowledging the critical influence of other family members, such as fathers and grandparents¹². Because family-based interventions have been proposed as the most effective approach to treating child obesity^{13 14}, knowledge about how other adult caretakers perceive and discuss young children's body weights will contribute to understanding familial barriers to treatment. To examine caretakers' perceptions of young children's body weights from a broader familial perspective, we designed this study to include family sets of mothers, fathers, and grandparents actively involved in taking care of preschool age children. As childhood obesity remains high among families with low socioeconomic status¹⁵⁻¹⁷, and as it is more difficult to recruit and retain these families in intervention programs^{18 19}, we chose to target a low income population.

METHODS

Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield metropolitan area, Oregon) were recruited in February – May 2011 through advertisements about the study, published in the job seekers' sections of Craigslist and local newspapers. The study's main research aim was to evaluate the role of grandparents in the development of preschoolers' lifestyles early in life, such that the active involvement of grandparents in family life (defined as spending time with the grandchild at least twice a month) was the primary criterion for inclusion in the study. Consequently, only families in which at least one parent and one grandparent were willing to be interviewed were included in the study. The other inclusion criteria specified that the child's age must be between 3-5 years, and that the child should have no underlying medical condition or disability which would affect his/her

weight. The study was approved by the Internal Review Board of the Oregon Social Learning Center.

In total, 49 family members (70% female) from sixteen families were interviewed. Participants' characteristics are summarized in Table 1. Due to the targeted recruitment process (ads in job advertisement sections) the sample displayed low levels of education and income; as many as 50% of parents were unemployed. Moreover, more than half of parents and two thirds of grandparents had overweight or obesity, according to WHO criteria²⁰. Of the children, 56% were either overweight or obese (overweight: 85th percentile \leq BMI < 95th percentile; obesity: BMI \geq 95th percentile)²¹⁻²³; those five who were categorized as obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI. The majority of children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific Northwest.

Insert Table 1 here.

Parents and grandparents were interviewed separately at the Oregon Social Learning Center. Free child care was provided on site, and the children were not present during the interviews. Each interviewed participant received compensation of \$50 for participating in the study. Prior to the interview, parents and grandparents completed a comprehensive sociodemographic questionnaire. All the interviewed parents and grandparents as well as the preschooler in focus had their height and weight measured, without shoes and wearing only light clothing, by trained research staff prior to the interviews. The interviews, which were conducted by a single researcher (either the second or the last author), lasted 1.5-2.5 hours

and explored the different roles of family members in shaping a child's lifestyle. Before coding, all participant names were changed to ensure confidentiality.

This paper focuses on the parents' and grandparents' perceptions of young children's body weights, with particular emphasis on overweight and obesity from a life course perspective, parental responsibility, and contexts in which parents and grandparents discuss preschoolers' body weights. The main questions were: (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? If yes, what lifestyle choices do you think are the most important? How/when do you think they can be promoted, and who do you think can do that? And who in the family plays the most important role when it comes to influencing the child's weight? If no, what makes you think that way? (3) What do you think about your child's (or grandchild's) weight? As compared to his/her siblings, cousins, other children, to the child's parents. Are you concerned/not concerned? (4) What do you think that the parents of your grandchild think about your grandchild's weight (or grandparents of your child about your child's weight)? Examine: If there are two parents (grandparents) in the house, do they have the same opinion? (5) Do you talk about your child (grandchild's) weight with his/her grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two parents in the house, which of them do you talk the most with and why? (6) Do you know if your child (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it? Did that happen in your presence? If yes, what did you say? If your child doesn't think about his/her weight, is it good or bad?

It should be noted that while all participants were asked the same main questions, the interview process allowed for fluidity, and follow-up questions were adapted according to

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each participant’s responses. Additionally, while the majority of data directly refer to the main questions listed, the present analysis includes pertinent comments the participants made throughout the interviews. The interviews were videotaped and transcribed in full. For this paper, transcript sections that related to the main questions were extracted and collated. The transcripts were then coded independently by the first and the last author, using a thematic discourse analysis approach. Discourse analysis is concerned with people’s use of language to describe and make sense of their realities, and is an appropriate approach for qualitative studies that examine people’s definitions of and spoken attitudes towards health issues²⁴. Over several in-person meetings and email correspondence, the two coders compared and discussed their codes, to examine and resolve potential disagreements, and reach consensus on the clustering of codes into themes and on the grouping of themes under thematic categories.

RESULTS

The analysis yielded twelve major themes, clustered under four thematic categories: Perceptions of young children’s body sizes, perceptions of the timeline of obesity, perceptions of parental responsibility and blame for childhood obesity, and perceptions of appropriate contexts for speaking about preschoolers’ body weights. Examples of participant quotes from each of the thematic categories and their constituent themes are presented in table format (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental material.

Insert Tables 2-5 here.

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 (99th 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 (>90th 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 99th 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

exercise habits are important because they translate into ‘long lasting effects’ and ‘hav[ing] more trouble as an adult’.

Perceptions of parental responsibility and blame for childhood obesity (Table 4)

The participants identified parents as bearing primary responsibility for their children’s eating and exercise habits and for their body weights. Even those participants who spoke of body size as being affected by genetics asserted that parents can still influence their children’s body weights. Likewise, participants who mentioned that children may be overweight or obese due to a health condition (e.g. glandular dysfunction) said that parents are responsible for making sure the child’s medical problem is identified and resolved. The participants argued that parents are responsible for children’s body weights because they can control what their children eat, provide a healthy food environment at home, encourage their children to play outside and be active, and model healthy behaviors themselves.

The participants’ concepts of parental responsibility linked with their attitudes towards parental blame for childhood obesity. Several participants said they ‘judged’ parents whose children were obese; some even said that the parents of obese children were guilty of child neglect or abuse. Participants identified childhood obesity as being transmitted from one generation to the next, and as the result of ‘lazy’ parenting. Having an obese child was an outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling blamed by clinicians for the child’s unexplained weight gain.

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 heredity⁹. 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 al⁹, 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 al¹¹, 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.

Just as the participants visualized obesity through images of older children or adults, they also spoke of obesity as a problem that might affect children later in life, but not in preschool age. Participants spoke of suffering from teasing as a school age child, or from poor health as an adult, as the consequences that marked obesity as a problem. While participants did say that they would recognize a body weight problem if their preschoolers showed negative changes in behavior, activity, and mood, they did not name immediate health risks. The participants' depictions of obesity revealed a disconnect between knowledge and perception, previously shown by Rich et al¹⁰. Although they were aware of their preschoolers' growth chart percentiles, most participants did not link these percentiles with the categories of 'overweight' and 'obesity'. Likewise, although participants were aware of the health risks associated with obesity, they did not link their preschoolers' body weights with potential problems in the present tense.

While the participants did not associate obesity with early childhood, they did take responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise practices. Along similar lines, however, the participants – including some whose children were classified as obese – blamed parents for childhood obesity. The participants' expressions of judgment toward the parents of obese children were aligned with broader social stigma attached to obesity^{25 26}. Given the participants' stigmatizing attitudes, it is not surprising that they did not discuss their preschoolers' body weights with other family members. Although parents and grandparents did discuss children's body sizes through comments on how 'big', 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were classified as overweight or obese did not discuss their body weights with family members, except when there was a perceived health problem. It is possible that, for the participants, discussion of body weight threatened to expose both themselves and their children to the risk

of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is important to note that, in deciding not to discuss body weight with their preschoolers (unless the children themselves raised the topic), the participants protected the children's body image and self-esteem. Moreover, like the parents described by Andreassen et al ²⁷, those parents who recognized their children needed to lose weight attempted to enact weight loss strategies without explicitly mentioning weight. As previous studies have shown, parental comments about body weight are associated with body dissatisfaction and reduced self-esteem in children²⁸⁻³⁰, such that the participants' stance on avoiding 'weight talk' with children was positive and should be encouraged.

The results of this study suggest that there are important gaps between clinical and lay perceptions of childhood obesity. While parents and grandparents are aware of their preschoolers' growth chart percentiles, these measures do not translate into recognition of young children's overweight or obesity. Without visual examples of how a preschool age child with overweight or obesity might look, such as sketched silhouettes or photographs at different weight categories³¹⁻³³, parents and grandparents continue to speak of children's excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss young children's body weights with the children and with one another, this might affect the success of clinical interventions for childhood obesity, in which children's caretakers are forced into a new and uncomfortable discussion.

The clinical implications of this study include several components. In discussions with parents and grandparents of preschool age children, clinicians should clarify how children's fat distribution and body sizes typically change with age. Clinicians should also speak with

children's caretakers about the meaning of growth chart percentiles, and provide visual examples of how children might look in each of the percentile categories. Moreover, clinicians should emphasize the immediate problems associated with obesity in early childhood, such as hypertension (present at more than 50% of children with obesity), dyslipidemia, motor skill development and orthopedic complications³⁴⁻³⁶.

The results also suggest that the countering of stigma should be an important part of the clinical management of childhood obesity. Given the social stigma and blame attached to parents of children with obesity, parents might contest a child's obesity diagnosis and be reluctant to take part in interventions to manage their child's condition³⁷. It is therefore crucial that clinicians directly address stigma when they speak to parents, emphasizing that childhood obesity is not the parents' fault, and that managing this condition together is a positive step. Similarly, clinicians should avoid addressing parents of children with obesity in ways that might make them feel guilty or judged. Finally, it is important that clinicians frame discussions of children's body weights sensitively, and encourage parents and grandparents to address children's eating and physical activity practices through positive words and actions, without emphasizing body weight to the children themselves.

This study had some limitations. While the sample was the largest ever reported in a qualitative investigation of parents' and grandparents' perceptions and attitudes concerning preschoolers' body weights, the children themselves were not interviewed. Moreover, the sample primarily consisted of families of Caucasian origin, representing the ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence of cultural background on perceptions of children's body sizes, which several studies have identified as important^{5 16 26}, could not be investigated. Additionally, as several participants

were single mothers, the number of fathers was not high enough to enable an assessment of differences between fathers’ and mothers’ perceptions and attitudes. Finally, while a number of families had a full or nearly-full set of grandparents participating, some had only one or two grandparents participating, due to circumstances such as the other grandparents’ living outside the area.

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. 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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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.

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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, Eklom 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.

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

17. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development of socioeconomic inequalities in obesity among Dutch pre-school and school-aged children *Obesity (Silver Spring)* 2014;In press

18. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.

19. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al. Strategies for Recruitment and Retention of Families from Low-Income, Ethnic Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child Weight. *Child Health Care* 2013;42(3):198-213.

20. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. . *World Health Organ Tech Rep Ser*, 2000:1-253.

21. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. *Adv Data* 2000(314):1-27.

22. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 CDC Growth Charts for the United States: methods and development. *Vital Health Stat 11* 2002(246):1-190.

23. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.

24. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.

25. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull* 2007;133(4):557-80.

26. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)* 2009;17(5):941-64.

- 1
2
3 27. Andreassen P, Gron L, Roessler KK. Hiding the plot: parents' moral dilemmas and
4 strategies when helping their overweight children lose weight. *Qual Health Res*
5 2013;23(10):1333-43.
6
7
8
9
10 28. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among
11 elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
12
13 29. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-
14 old girls. *Pediatrics* 2001;107(1):46-53.
15
16
17 30. Neumark-Sztainer D, Bauer KW, Friend S, Hannan PJ, Story M, Berge JM. Family
18 weight talk and dieting: how much do they matter for body dissatisfaction and
19 disordered eating behaviors in adolescent girls? *J Adolesc Health* 2010;47(3):270-6.
20
21 31. Eckstein KC, Mikhail LM, Ariza AJ, Thomson JS, Millard SC, Binns HJ. Parents'
22 perceptions of their child's weight and health. *Pediatrics* 2006;117(3):681-90.
23
24 32. Warschburger P, Kroller K. Maternal perception of weight status and health risks
25 associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.
26
27 33. Parkinson KN, Drewett RF, Jones AR, Adamson AJ. Mothers' judgements about their
28 child's weight: distinguishing facts from values. *Child Care Health Dev*
29 2013;39(5):722-7.
30
31 34. Nielsen TR, Gamborg M, Fonvig CE, Kloppenborg J, Hvidt KN, Ibsen H, et al.
32 Changes in lipidemia during chronic care treatment of childhood obesity. *Child Obes*
33 2012;8(6):533-41.
34
35 35. O'Malley G, Hussey J, Roche E. A pilot study to profile the lower limb
36 musculoskeletal health in children with obesity. *Pediatr Phys Ther* 2012;24(3):292-8.
37
38 36. Maggio AB, Aggoun Y, Marchand LM, Martin XE, Herrmann F, Beghetti M, et al.
39 Associations among obesity, blood pressure, and left ventricular mass. *J Pediatr*
40 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.

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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

<i>Theme 1: Young children are 'pudgy' or 'big for their age', but not obese</i>	
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.	
<i>Theme 2: 'Baby fat' is cute and healthy</i>	
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.	
<i>Theme 3: Children go through 'growth spurts' and 'stretching out'</i>	
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).

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.

<i>Theme 4: A high body weight becomes problematic later in childhood</i>	
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.
<i>Theme 5: Children's body weight becomes problematic when it affects their activities or health</i>	
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.
<i>Theme 6: Obesity becomes problematic in adulthood</i>	
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.

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 <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.

<i>Theme 9: Parents and grandparents do not discuss preschoolers' body weights with them, unless the children raise the topic</i>	
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".
<i>Theme 10: It's acceptable to discuss how big or strong preschoolers are.</i>	
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.
10.9 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.
<i>Theme 11: Discussing preschoolers' body weights can affect their self-esteem negatively</i>	
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.

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

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60	<p>been concerned about her weight.</p> <p>1.15 Gp10P1 (Mother) **: I think he has a good amount of weight on his bones. And he is normally big for his age.</p> <p>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.</p> <p>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.</p> <p>Theme 2: 'Baby fat' is cute and healthy</p> <p>2.1 Gp02P1 (Father) *: she's got some cute baby fat but it's nothing to be worried about.</p> <p>2.2 Gp05P2 (Father) *: I think children should be nice and thick. (...) A healthy baby, nice thick chubby cheeks, chubby little legs, you know.</p> <p>2.3 Gp05P3 (Mother's mother) *: You know, she's got that little girl pudge 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 pudge.</p> <p>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.</p> <p>2.5 Gp07P1 (Mother) *: She's well within range, she's got that cute little extended abdomen of a toddler, you know.</p> <p>2.6 Gp10G1 (Father's mother) **: our kids were always in the 95th percentile... robust kids. I think he seems very healthy.</p> <p>2.7 Gp13G1 (Mother's mother) ***: I think he's in the 50th percentile for weight and over a 100th for height.</p> <p>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.</p> <p>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.</p> <p>2.10 Gp11P1 (Mother) ***: Well we kind of joke about it because my daughter's kind of got the little girl gut.</p> <p>2.11 Gp01G1 (Mother's mother) ***: she does have cute little love handles.</p> <p>2.12 Gp10P1 (Mother) **: I just think chubbier kids are cuter. So I try to keep him a little chubby.</p> <p>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</p>
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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

- 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?"

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

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

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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.

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“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 parents and grandparents' perceptions of preschoolers' body sizes. Interview questions also explored perceptions of 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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43 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with
44 parents and grandparents about the meaning and appearance of obesity in early childhood, as
45 well as counteract the social stigma attached to obesity, in order to improve the effectiveness
46 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.

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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 childhood¹⁻³, 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 ages⁴⁻⁶. 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 level⁷. 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.⁸

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 conclusively⁶. To date, only two studies^{9 10} 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 environment⁹. 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 95th percentile. These parents, notably, were
88 aware of obesity related health risks¹⁰. More recently, focus groups revealed that, in assessing
89 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 is¹¹.

So far, existing research on parental perceptions of children's body weights has focused almost exclusively on mothers, and has not examined the critical influence of other family members, such as fathers and grandparents¹². Because family-based interventions have been proposed as the most effective approach to treating child obesity^{13 14}, knowledge about how other adult caretakers perceive and discuss young children's body weights will contribute to understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-judgmental communication about children's eating practices and body sizes is important for the prevention of body dissatisfaction and disordered eating in childhood and adolescence^{15 16}.

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

As childhood obesity remains high among families with low socioeconomic status¹⁷⁻¹⁹, and as it is more difficult to recruit and retain these families in intervention programs^{20 21}, we chose to target a low income population.

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112 METHODS

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114 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield
115 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements
116 about the study, published in a local newspaper and the volunteers’ and job seekers’ sections
117 of Craigslist (the most widely used classified advertisement website in the United States). The
118 active involvement of grandparents in family life (defined as spending time with the
119 grandchild at least twice a month) was the primary criterion for inclusion in the study.
120 Consequently, only families in which at least one parent and one grandparent were willing to
121 be interviewed were included in the study. The other inclusion criteria specified that the
122 child’s age must be between 3-5 years, and that the child should have no underlying medical
123 condition or disability which would affect his/her weight. All families who contacted the
124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.
125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.
126 When the participants first met with the researchers, and before the interviews took place, the
127 researchers verbally explained the informed consent forms to each participant, and answered
128 any questions participants had . If the parents/grandparents agreed to participate, they were
129 asked to read and sign the written project description and project consent forms. The families
130 received a copy of the written study description and informed consent forms.
131
132 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.
133 Free child care was provided on site, and the children were not present during the interviews.
134 Each interviewed participant received compensation of \$50 for participating in the study.
135 Prior to the interview, parents and grandparents completed a comprehensive
136 sociodemographic questionnaire routinely used in research projects involving families at the
137 Oregon Social Learning Center; the questionnaire included items concerning family
138 composition, parental education, employment status, and living conditions. All the

139 interviewed parents and grandparents as well as the preschooler in focus had their height and
140 weight measured, without shoes and wearing only light clothing, by trained research staff
141 prior to the interviews. The weight status using height and weight was not calculated prior the
142 interview, thus the interviewer and the family members were not informed about the child's or
143 family members' weight status. The interviews, which were conducted by a single researcher
144 (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of
145 family members in shaping a child's lifestyle. Before coding, all participant names were
146 changed to ensure confidentiality.

147

148 This paper focuses on the parents' and grandparents' perceptions of young children's body
149 weights, with particular emphasis on overweight and obesity, parental responsibility for
150 childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body
151 weights. The main questions were: (1) Do you think that how much a child weighs matters? If
152 yes, why? If not, why? (2) How much do you think that a child's weight is possible to
153 control/controllable? If yes, what lifestyle choices do you think are the most important?
154 How/when do you think they can be promoted, and who do you think can do that? And who
155 in the family plays the most important role when it comes to influencing the child's weight? If
156 no, what makes you think that way? (3) What do you think about your child's (or
157 grandchild's) weight? As compared to his/her siblings, cousins, other children, to the child's
158 parents. Are you concerned/not concerned? (4) What do you think that the parents of your
159 grandchild think about your grandchild's weight (or grandparents of your child about your
160 child's weight)? Examine: If there are two parents (grandparents) in the house, do they have
161 the same opinion? (5) Do you talk about your child (grandchild's) weight with his/her
162 grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two parents in
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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(grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it? Did that happen in your presence? If yes, what did you say? If your child doesn't think about his/her weight, is it good or bad?

It should be noted that while all participants were asked the same main questions, the interview process allowed for fluidity, and follow-up questions were adapted according to each participant's responses. Additionally, while the majority of data directly refer to the main questions listed, the present analysis includes pertinent comments the participants made throughout the interviews. The interviews were videotaped and transcribed in full; videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this paper, transcript sections that related to the main questions were extracted and collated. The transcripts were then coded independently by the first and the last author, using a thematic discourse analysis approach. Discourse analysis is concerned with people's use of language to describe and make sense of their realities, and is an appropriate approach for qualitative studies that examine people's definitions of and spoken attitudes towards health issues²². Thematic analysis facilitates the identification of patterns in qualitative data, and therefore allowed the researchers to delineate themes across the data set²³. Over several in-person meetings and email correspondence, the two coders compared and discussed their codes, to examine and resolve potential disagreements, and reach consensus on the clustering of codes into themes and on the grouping of themes under thematic categories.

RESULTS

In total, 49 family members (70% female) from sixteen families were interviewed. The sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation²⁴. Seven families consisted of single parent with sole responsibility for the child (five single

189 mothers and two single fathers). In ten families, only one grandparent was interviewed; in two
190 families, two grandparents were interviewed; in three families, three grandparents were
191 interviewed; and in one family, four grandparents were interviewed. In five of the families, all
192 grandparents who had contact with the grandchild were interviewed. The most common
193 reason for not being able to include full sets were the other grandparents' residing outside the
194 study area.

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

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203 All the interviewed parents and grandparents as well as the preschooler in focus had their
204 height and weight measured, without shoes and wearing only light clothing, by trained
205 research staff prior to the interviews. These measurements were taken in order to
206 contextualize the participants' stated perceptions of and attitudes toward childhood
207 overweight/obesity and associated lifestyle factors. The participants' and the children's BMI
208 statuses were not calculated prior to the interviews, so as not to bias the interview process.
209 Thus, the interviewers and the participants were not informed about the child's or any of the
210 adult family members' weight status. More than half of parents and two thirds of grandparents
211 had overweight or obesity, according to World Health Organization criteria²⁵. Of the children,
212 56% were either overweight or obese (overweight: 85th percentile \leq Body Mass Index (BMI))

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213 < 95th percentile; obesity: BMI \geq 95th percentile)²⁶⁻²⁸; those five who were categorized as
214 obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.

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216 *Insert Table 1 here.*

217

218 The analysis yielded twelve major themes, clustered under four thematic categories:
219 Perceptions of young children’s body sizes, perceptions of the timeline of obesity, perceptions
220 of parental responsibility and blame for childhood obesity, and perceptions of appropriate
221 contexts for speaking about preschoolers’ body weights. While the number of fathers was not
222 high enough to enable an assessment of differences between fathers’ and mothers’ perceptions
223 and attitudes, it is possible to say that the participants’ responses were consistent across the
224 sample, and no generational differences were observed between the parents’ and the
225 grandparents’ perceptions of their preschoolers’ body sizes. Examples of participant quotes
226 from each of the thematic categories and their constituent themes are presented in table format
227 (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental
228 material (Supplementary Tables 1-4).

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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’

and/or 'big for their age'. Notably, even the father of the heaviest child in the sample (99th 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 (>90th 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 99th 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 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing] more trouble as an adult'.

Perceptions of parental responsibility and blame for childhood obesity (Table 4)

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The participants identified parents as bearing primary responsibility for their children’s eating and exercise habits and for their body weights. Even those participants who spoke of body size as being affected by genetics asserted that parents can still influence their children’s body weights. Likewise, participants who mentioned that children may be overweight or obese due to a health condition (e.g. glandular dysfunction) said that parents are responsible for making sure the child’s medical problem is identified and resolved. The participants argued that parents are responsible for children’s body weights because they can control what their children eat, provide a healthy food environment at home, encourage their children to play outside and be active, and model healthy behaviors themselves.

The participants’ concepts of parental responsibility linked with their attitudes towards parental blame for childhood obesity. Several participants said they ‘judged’ parents whose children were obese; some even said that the parents of obese children were guilty of child neglect or abuse. Participants identified childhood obesity as being transmitted from one generation to the next, and as the result of ‘lazy’ parenting. Having an obese child was an outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling blamed by clinicians for the child’s weight gain, which, as she said, neither she nor the child’s clinicians could explain.

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. Some participants cited their preschoolers' 'apparent 'comfort' with – or lack of self-consciousness about – their bodies 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, excepting the parents of the two children with the height weight statuses, all parents avoided discussing their children's body weights not only with the children themselves, but also with the children's grandparents; likewise, excepting one grandmother, all 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

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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 heredity⁹. 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 ⁹, the authors of the present study suggest that most participants used these words not as euphemisms, as underscored by the participants’ consistent descriptions of children’s higher body weights in positive terms – as ‘cute’ or ‘healthy’. While participants said that preschoolers’ body weights would be problematic if the child became ‘visibly overweight’, it was less clear how a ‘visibly overweight’ preschooler might look. The participants’ discussions focused, instead, on signs that might negate ‘visible overweight’ in a preschooler, including tallness, muscularity, and physical strength. As noted by Jones et al¹¹, when participants described obesity, it was through extreme cases of morbid obesity in later childhood or adulthood, with some citing examples of older children who were ‘miniatures of their parents’ and contestants on *The Biggest Loser* who weighed 400 lbs. Future research should explore how a ‘visibly overweight’ preschooler might look to parents and 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 al¹⁰. 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^{29 30}. 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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361 discussion of body weight threatened to expose both themselves and their children to the risk
362 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is
363 important to note that, in deciding not to discuss body weight with their preschoolers (unless
364 the children themselves raised the topic), the participants protected the children’s body image
365 and self-esteem. Moreover, like the parents described by Andreassen et al ³¹, those parents
366 who recognized their children needed to lose weight attempted to enact weight loss strategies
367 without explicitly mentioning weight. As previous studies have shown, parental comments
368 about body weight are associated with body dissatisfaction and reduced self-esteem in
369 children^{15 32 33}, such that the participants’ stance on avoiding ‘weight talk’ with children was
370 positive and should be encouraged. A recent study has proposed a set of guidelines to help
371 parents discuss body image and eating with preschool aged children in a supportive way that
372 is protective of children’s self-esteem¹⁶.
373
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 categories³⁴⁻³⁶, 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.
385

386 The clinical implications of this study include several components. In discussions with parents
387 and grandparents of preschool age children, clinicians should clarify how children's fat
388 distribution and body sizes typically change with age. Clinicians should also speak with
389 children's caretakers about the meaning of growth chart percentiles, and provide visual
390 examples of how children might look in each of the percentile categories. Moreover,
391 clinicians should emphasize the immediate problems associated with obesity in early
392 childhood, such as hypertension (present in more than 50% of children with obesity),
393 dyslipidemia, motor skill development and orthopedic complications³⁷⁻³⁹.

394
395 The results also suggest that the countering of stigma should be an important part of the
396 clinical management of childhood obesity. Given the social stigma and blame attached to
397 parents of children with obesity, parents might contest a child's obesity diagnosis and be
398 reluctant to take part in interventions to manage their child's condition⁴⁰. It is therefore crucial
399 that clinicians directly address stigma when they speak to parents, emphasizing that childhood
400 obesity is not the parents' fault, and that managing this condition together is a positive step.
401 Similarly, clinicians should avoid addressing parents of children with obesity in ways that
402 might make them feel guilty or judged. Finally, it is important that clinicians frame
403 discussions of children's body weights sensitively, and encourage parents and grandparents to
404 address children's eating and physical activity practices through positive words and actions,
405 without emphasizing body weight to the children themselves.

406
407 This study had some limitations. While the sample was the largest ever reported in a
408 qualitative investigation of parents' and grandparents' perceptions and attitudes concerning
409 preschoolers' body weights, the families were mainly of Caucasian origin, representing the
410 ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence

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of cultural background on perceptions of children’s body sizes, which several studies have identified as important^{5 18 30}, could not be investigated. As the study targeted families of low socioeconomic status, further research is needed to determine whether the results can be generalized to other populations. Additionally, as several participants were single mothers, the number of fathers was not high enough to enable an assessment of differences between fathers’ and mothers’ perceptions and attitudes. Finally, while a number of families had a full or nearly-full set of grandparents participating, some had only one or two grandparents participating, due to circumstances such as the other grandparents’ living outside the area.

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. 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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437

438

439 **CONTRIBUTORSHIP STATEMENT**

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

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

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

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

449

450 **COMPETING INTERESTS**

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

453

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457 03443).

458

DATA SHARING

Online supplementary table S1-4 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.

9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics* 2001;107(5):1138-46.

10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of health status and play activities in parents of overweight Hispanic toddlers and preschoolers. *Fam Community Health* 2005;28(2):130-41.

11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes (Lond)* 2011;35(7):953-62.

12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding healthy behaviours for preventing overweight and obesity in young children: a systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).

13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009(1):CD001872.

14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.

15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body dissatisfaction and unhealthy eating patterns in preschool children: A Delphi consensus study. *Body Image* 2014;11(4):418-25.
17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in body weight of German children reverse direction between the ages of 2 and 6 years. *J Nutr* 2003;133(3):789-96.
18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity among young U.S. children living in low-income families, 2008-2011. *Pediatrics* 2013;132(6):1006-13.
19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development of socioeconomic inequalities in obesity among Dutch pre-school and school-aged children *Obesity (Silver Spring)* 2014;In press
20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.
21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al. Strategies for Recruitment and Retention of Families from Low-Income, Ethnic Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child Weight. *Child Health Care* 2013;42(3):198-213.
22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
23. Braun V, Clarke V. Using thematic analysis in psychology. . *Qualitative Research in Psychology* 2006;3(2):77-101.
24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59-82.
25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. . *World Health Organ Tech Rep Ser*, 2000:1-253.
26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. *Adv Data* 2000(314):1-27.
27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 CDC Growth Charts for the United States: methods and development. *Vital Health Stat 11* 2002(246):1-190.
28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.
29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull* 2007;133(4):557-80.
30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)* 2009;17(5):941-64.
31. 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.
32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old girls. *Pediatrics* 2001;107(1):46-53.
33. 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.
34. 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.

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35. Warschburger P, Kroller K. Maternal perception of weight status and health risks associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.

36. 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.

37. 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.

38. 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.

39. 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.

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

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 %)

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

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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<i>Theme 1: Young children are 'pudgy' or 'big for their age', but not obese</i>	
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.
<i>Theme 2: 'Baby fat' is cute and healthy</i>	
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.
<i>Theme 3: Children go through 'growth spurts' and 'stretching out'</i>	
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

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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. <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. Examples of participants' quotes on perceptions of parental responsibility and blame for childhood obesity.

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.

7.5 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.

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

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

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602 * = parent/grandparent of child with normal weight
603 ** = parent/grandparent of child with overweight
604 *** = 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 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.

12.7 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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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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45 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with
46 parents and grandparents about the meaning and appearance of obesity in early childhood, as
47 well as counteract the social stigma attached to obesity, in order to improve the effectiveness
48 of family-based interventions to manage obesity in early childhood.

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 childhood¹⁻³, 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 ages⁴⁻⁶. 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 level⁷. 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~~weight.⁸

Most studies have applied a quantitative approach to describe parents' miscategorization of children's weight status; however, the underlying factors have not been identified conclusively⁶. To date, only two studies^{9 10} 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~~moreover, distrusted pediatric growth charts, and attributed childhood obesity to genetics, rather than to factors modifiable in the home environment.⁹ 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 95th percentile. These parents, notably, were aware of obesity related health risks¹⁰. 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

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93 sizes can be defined as extreme, thus skewing their perceptions of what a healthy body size
94 is¹¹.
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96 So far, existing research on parental perceptions of children's body weights has focused
97 almost exclusively on mothers, and has not acknowledged the critical influence of
98 other family members, such as fathers and grandparents¹². Because family-based
99 interventions have been proposed as the most effective approach to treating child obesity^{13 14},
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^{15 16}. 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^{15-17 17-19},
113 and as it is more difficult to recruit and retain these families in intervention programs^{18-19 20 21},
114 we chose to target a low income population.

116 METHODS

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Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield metropolitan area, Oregon) were recruited in February – May 2011 through advertisements about the study, published in a local newspaper and the volunteers' and job seekers' sections of Craigslist and local newspapers. The study's main research aim was to evaluate (the role of grandparents most widely used classified advertisement website in the development of preschoolers' lifestyles early in life, such that the United States). The active involvement of grandparents in family life (defined as spending time with the grandchild at least twice a month) was the primary criterion for inclusion in the study. Consequently, only families in which at least one parent and one grandparent were willing to be interviewed were included in the study. The other inclusion criteria specified that the child's age must be between 3-5 years, and that the child should have no underlying medical condition or disability which would affect his/her weight. The study was approved by the Internal Review Board of the Oregon Social Learning Center. All families who contacted the study coordinator and were found to fulfill the inclusion criteria were recruited to the study. The study was approved by the Internal Review Board of the Oregon Social Learning Center. When the participants first met with the researchers, and before the interviews took place, the researchers verbally explained the informed consent forms to each participant, and answered any questions participants had. If the parents/grandparents agreed to participate, they were asked to read and sign the written project description and project consent forms. The families received a copy of the written study description and informed consent forms.

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

and two thirds of grandparents had overweight or obesity, according to WHO criteria²⁰. Of the children, 56% were either overweight or obese (overweight: 85th percentile \leq BMI $<$ 95th percentile; obesity: BMI \geq 95th percentile)²¹⁻²³; those five who were categorized as obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI. The majority of children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific Northwest.

Insert Table 1 here.

Parents and grandparents were interviewed separately at the Oregon Social Learning Center. Free child care was provided on site, and the children were not present during the interviews. Each interviewed participant received compensation of \$50 for participating in the study. Prior to the interview, parents and grandparents completed a comprehensive sociodemographic questionnaire: routinely used in research projects involving families at the Oregon Social Learning Center; the questionnaire included items concerning family composition, parental education, employment status, and living conditions. All the interviewed parents and grandparents as well as the preschooler in focus had their height and weight measured, without shoes and wearing only light clothing, by trained research staff prior to the interviews. The weight status using height and weight was not calculated prior the interview, thus the interviewer and the family members were not informed about the child's or family members' weight status. The interviews, which were conducted by a single researcher (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of family members in shaping a child's lifestyle. Before coding, all participant names were changed to ensure confidentiality.

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168 This paper focuses on the parents’ and grandparents’ perceptions of young children’s body
169 weights, with particular emphasis on overweight and obesity ~~from a life course perspective,~~
170 parental responsibility for childhood obesity, and contexts in which parents and grandparents
171 discuss preschoolers’ body weights. The main questions were: (1) Do you think that how
172 much a child weighs matters? If yes, why? If not, why? (2) How much do you think that a
173 child’s weight is possible to control/controllable? If yes, what lifestyle choices do you think
174 are the most important? How/when do you think they can be promoted, and who do you think
175 can do that? And who in the family plays the most important role when it comes to
176 influencing the child’s weight? If no, what makes you think that way? (3) What do you think
177 about your child’s (or grandchild’s) weight? As compared to his/her siblings, cousins, other
178 children, to the child’s parents. Are you concerned/not concerned? (4) What do you think that
179 the parents of your grandchild think about your grandchild’s weight (or grandparents of your
180 child about your child’s weight)? Examine: If there are two parents (grandparents) in the
181 house, do they have the same opinion? (5) Do you talk about your child (grandchild’s) weight
182 with his/her grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two
183 parents in the house, which of them do you talk the most with and why? (6) Do you know if
184 your child (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it?
185 Did that happen in your presence? If yes, what did you say? If your child doesn’t think about
186 his/her weight, is it good or bad?
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188 It should be noted that while all participants were asked the same main questions, the
189 interview process allowed for fluidity, and follow-up questions were adapted according to
190 each participant’s responses. Additionally, while the majority of data directly refer to the main
191 questions listed, the present analysis includes pertinent comments the participants made
192 throughout the interviews. The interviews were videotaped and transcribed in full;

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193 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this
194 paper, transcript sections that related to the main questions were extracted and collated. The
195 transcripts were then coded independently by the first and the last author, using a thematic
196 discourse analysis approach. Discourse analysis is concerned with people's use of language to
197 describe and make sense of their realities, and is an appropriate approach for qualitative
198 studies that examine people's definitions of and spoken attitudes towards health issues^{24 22}.
199 Thematic analysis facilitates the identification of patterns in qualitative data, and therefore
200 allowed the researchers to delineate themes across the data set²³. Over several in-person
201 meetings and email correspondence, the two coders compared and discussed their codes, to
202 examine and resolve potential disagreements, and reach consensus on the clustering of codes
203 into themes and on the grouping of themes under thematic categories.

205 RESULTS

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

216 Participants' characteristics are summarized in Table 1. All data refer to parents and
217 grandparents who were interviewed as part of the study. Due to the targeted recruitment

process (ads in job advertisement sections) the sample displayed low levels of education and income; as many as 50% of parents were unemployed. The majority of children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific Northwest.

All the interviewed parents and grandparents as well as the preschooler in focus had their height and weight measured, without shoes and wearing only light clothing, by trained research staff prior to the interviews. These measurements were taken in order to contextualize the participants' stated perceptions of and attitudes toward childhood overweight/obesity and associated lifestyle factors. The participants' and the children's BMI statuses were not calculated prior to the interviews, so as not to bias the interview process. Thus, the interviewers and the participants were not informed about the child's or any of the adult family members' weight status. More than half of parents and two thirds of grandparents had overweight or obesity, according to World Health Organization criteria²⁵. Of the children, 56% were either overweight or obese (overweight: 85th percentile < Body Mass Index (BMI) < 95th percentile; obesity: BMI ≥ 95th percentile)²⁶⁻²⁸; those five who were categorized as obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.

Insert Table 1 here.

The analysis yielded twelve major themes, clustered under four thematic categories: Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions of parental responsibility and blame for childhood obesity, and perceptions of appropriate contexts for speaking about preschoolers' body weights. While the number of fathers was not high enough to enable an assessment of differences between fathers' and mothers' perceptions

and attitudes, it is possible to say that 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. Examples of participant quotes from each of the thematic categories and their constituent themes are presented in table format (Tables 2-5). The complete sets of pertinent participant quotes are provided as supplemental material ([Supplementary Tables 1-4](#)).

Insert Tables 2-5 here.

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 (99th 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 (>90th 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)

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7 268 The participants spoke of obesity as a problem that may affect the preschoolers in the future,
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9 269 but not at present. Several participants indicated that a high body weight becomes problematic
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11 270 when the child reaches school age, particularly due to the risk of teasing, social exclusion, and
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13 271 bullying. Participants also said that a high body weight becomes problematic when it
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15 272 negatively affects the child's health, activities, behaviors, or mood. However, only one
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17 273 participant, whose child was in the 99th percentile for weight, said that she could notice the
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19 274 detrimental effects of the child's body weight at present. Thus, even when speaking of obesity
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21 275 in terms of impact on activity and health, the participants placed it outside the remit of the
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23 276 preschoolers' current experience. Participants also spoke of obesity as problematic due to its
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25 277 manifestations in adulthood, expressing that children's body weights and their eating and
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27 278 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing]
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29 279 more trouble as an adult'.
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32 281 **Perceptions of parental responsibility and blame for childhood obesity (Table 4)**
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34 282 The participants identified parents as bearing primary responsibility for their children's eating
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36 283 and exercise habits and for their body weights. Even those participants who spoke of body
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38 284 size as being affected by genetics asserted that parents can still influence their children's body
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40 285 weights. Likewise, participants who mentioned that children may be overweight or obese due
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42 286 to a health condition (e.g. glandular dysfunction) said that parents are responsible for making
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44 287 sure the child's medical problem is identified and resolved. The participants argued that
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46 288 parents are responsible for children's body weights because they can control what their
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48 289 children eat, provide a healthy food environment at home, encourage their children to play
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50 290 outside and be active, and model healthy behaviors themselves.
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The participants' concepts of parental responsibility linked with their attitudes towards parental blame for childhood obesity. Several participants said they 'judged' parents whose children were obese; some even said that the parents of obese children were guilty of child neglect or abuse. Participants identified childhood obesity as being transmitted from one generation to the next, and as the result of 'lazy' parenting. Having an obese child was an outward sign of 'failing' as a parent, and one mother whose child was obese spoke of feeling blamed by clinicians for the child's ~~unexplained weight gain~~ weight gain, which, as she said, neither she nor the child's clinicians could explain.

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.~~ Some participants cited their preschoolers' ~~'comfortable' behaviors~~ apparent 'comfort' with – or lack of self-consciousness about – their bodies 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.

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~~Notably,~~ Notably, excepting the parents of the two children with the height weight statuses, all
parents avoided discussing their children’s body weights not only with the children
themselves, but also with the children’s grandparents; likewise, excepting one grandmother,
all 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 heredity⁹. 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

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

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 pudgy' or 'cute baby fat'.

346 Like Jain et al⁹, 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 al¹¹, 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.

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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depictions of obesity revealed a disconnect between knowledge and perception, previously shown by Rich et al¹⁰. Although they were aware of their preschoolers' growth chart percentiles, most participants did not link these percentiles with the categories of 'overweight' and 'obesity'. Likewise, although participants were aware of the health risks associated with obesity in adulthood, they did not link their preschoolers' body weights with potential problems in the present tense.

While the participants did not associate obesity with early childhood, they did take responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise practices. Along similar lines, however, the participants – including some whose children were classified as obese –blamed parents for childhood obesity. The participants' expressions of judgment toward the parents of obese children were aligned with broader social stigma attached to obesity^{25-2629 30}. Given the participants' stigmatizing attitudes, it is not surprising that they did not discuss their preschoolers' body weights with other family members.

Although parents and grandparents did discuss children's body sizes through comments on how 'big', 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were classified as overweight or obese did not discuss their body weights with family members, except when there was a perceived health problem. It is possible that, for the participants, discussion of body weight threatened to expose both themselves and their children to the risk of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is important to note that, in deciding not to discuss body weight with their preschoolers (unless the children themselves raised the topic), the participants protected the children's body image and self-esteem. ~~Moreover, like the parents described by Andreassen et al²⁷~~ Moreover, like the parents described by Andreassen et al³¹, those parents who recognized their children needed to lose weight attempted to enact weight loss strategies without

explicitly mentioning weight. As previous studies have shown, parental comments about body weight are associated with body dissatisfaction and reduced self-esteem^{28-30,15,32,33}, such that the participants' stance on avoiding 'weight talk' with children was positive and should be encouraged. A recent study has proposed a set of guidelines to help parents discuss body image and eating with preschool aged children in a supportive way that is protective of children's self-esteem¹⁶.

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

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

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childhood, such as hypertension (present ~~at~~ⁱⁿ more than 50% of children with obesity),
dyslipidemia, motor skill development and orthopedic complications³⁴⁻³⁶³⁷⁻³⁹.

The results also suggest that the countering of stigma should be an important part of the clinical management of childhood obesity. Given the social stigma and blame attached to parents of children with obesity, parents might contest a child's obesity diagnosis and be reluctant to take part in interventions to manage their child's condition^{37, 40}. It is therefore crucial that clinicians directly address stigma when they speak to parents, emphasizing that childhood obesity is not the parents' fault, and that managing this condition together is a positive step. Similarly, clinicians should avoid addressing parents of children with obesity in ways that might make them feel guilty or judged. Finally, it is important that clinicians frame discussions of children's body weights sensitively, and encourage parents and grandparents to address children's eating and physical activity practices through positive words and actions, without emphasizing body weight to the children themselves.

This study had some limitations. While the sample was the largest ever reported in a qualitative investigation of parents' and grandparents' perceptions and attitudes concerning preschoolers' body weights, the ~~children themselves were not interviewed. Moreover, the sample primarily consisted of families~~^{families were mainly} of Caucasian origin, representing the ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence of cultural background on perceptions of children's body sizes, which several studies have identified as important^{5 +618 2630}, could not be investigated. As the study targeted families of low socioeconomic status, further research is needed to determine whether the results can be generalized to other populations. Additionally, as several participants were single mothers, the number of fathers was not high enough to enable an assessment of

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.

446 CONCLUSION

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.

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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.

476 **COMPETING INTERESTS**

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

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483 03443).

485 **DATA SHARING**

486 Online supplementary table S6-9 containing complete sets of pertinent participant quotes. No
487 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.
9. — Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics* 2001;107(5):1138-46.
10. — Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of health status and play activities in parents of overweight Hispanic toddlers and preschoolers. *Fam Community Health* 2005;28(2):130-41.
11. — Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes (Lond)* 2011;35(7):953-62.
12. — Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding healthy behaviours for preventing overweight and obesity in young children: a systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
13. — Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009(1):CD001872.
14. — Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
15. — Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body dissatisfaction and unhealthy eating patterns in preschool children: A Delphi consensus study. *Body Image* 2014;11(4):418-25.
17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in body weight of German children reverse direction between the ages of 2 and 6 years. *J Nutr* 2003;133(3):789-96.

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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.
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.

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- 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%)

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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~~ The main reasons for unemployment among parents were child care, pursuing higher education, and not finding work; among grandparents, unemployment was due to not finding 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).~~

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

Table Legends: Gp# - family group number; P - parent; G – grandparent.
* = parent/grandparent of ~~the thematic categories and their constituent themes. The complete~~
~~sets~~child with normal weight
** = parent/grandparent of ~~pertinent participant quotes are provided as supplemental material.~~
child with overweight
*** = 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.

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

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

* = parent/grandparent of the thematic categories and their constituent themes. The complete

setschild with normal weight

** = parent/grandparent of pertinent participant quotes are provided as supplemental

material-child with overweight

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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.

Table 5. ~~Pereceptions~~Examples of participants’ quotes on perceptions of appropriate contexts for speaking about preschoolers’ body weights. ~~Examples of participant quotes from each~~

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

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

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

*** = parent/grandparent of child with obesity

Theme 9: Parents and grandparents ~~do not~~ discuss preschoolers’ body weights with them, unless 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.

~~10.1 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 Gp14G1 (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.~~

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

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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.

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
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<i>Theme 1: Young children are ‘pudgy’ or ‘big for their age’, but not obese</i>
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

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

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.

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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.

7.2 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

1	sure they're being active.
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5	7.11 Gp04G2 (Mother's father) *: I see a lot of kids just go and play their computer games and
6	TVs sitting down eating chips, and that's not the kid's fault.
7	
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9	7.12 Gp09P1 (Mother) *: three year-olds should be running around, they should be active and
10	they shouldn't be sitting on the couch eating Cheetos all day. So that's not a very healthy
11	lifestyle and to each their own with parenting but in my personal opinion, I think it can be
12	controlled.
13	
14	7.13 Gp12G3 (Father's mother) ***: If you are active, the kids will be active. If you are into
15	nutrition, the kids will be into nutrition.
16	
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18	7.14 Gp12P2 (Father) ***: There are some genetic factors. In terms of parents directing
19	nutrition and activity, they have probably 95% control.
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21	7.15 Gp15P1 (mother) *: some kids will be more susceptible to gaining weight than others (...)
22	but I think it's totally controllable what you're going to feed them.
23	
24	Theme 8: The parents of obese children are blamed by themselves and by others
25	
26	8.1 Gp04P2 (Mother) *: Honestly, when I see kids that are incredibly overweight I think it's
27	child abuse, it really upsets me.
28	
29	8.2 Gp05G3 (Mother's mother) *: Sometimes I see heavy parents who don't seem to exercise,
30	and don't seem to eat right. And I see their children, and I say, "Oh my gosh, they are passing
31	that down to the next generation."
32	
33	8.3 GP10G4 (Stepmother of the father) **: They [obese children] are trying to get some safety
34	net through food because they are neglected by their parents or grandparents.
35	
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37	8.4 Gp13P1 (Mother) ***: If I had a fat kid, it would be looking at me every day, "I'm a failure.
38	I'm doing something wrong."
39	
40	8.5 Gp04P2 (Mother) *: I think most adults who are overweight can probably attribute it to their
41	parents.
42	
43	8.6 Gp11P1 (Mother) ***: I hate those parents who are like, "Well, she'll only eat at
44	McDonald's." "No! She won't. You let her only eat at McDonald's. Or you let her only eat fruit
45	snacks."
46	
47	
48	8.7 Gp13P1 (Mother) ***: you see these kids that can barely move, and it's like how do you not
49	be judgmental about that, because you look at the parent, and they look like a miniature of their
50	parent.
51	
52	8.8 Gp13G2 (Mother's father) ***: to me, seeing an overweight six year old, it's like what is
53	going on here? I think it's the adults, the parents, guardians, are the ones who have the most
54	effect on that.
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57	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?"

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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 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 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.

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“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 parents and grandparents' perceptions of preschoolers' body sizes. Interview questions also explored perceptions of 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 a classified website (Craigslist) and in a local newspaper. 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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43 **CONCLUSIONS:** The results suggest that clinicians should clearly communicate with
44 parents and grandparents about the meaning and appearance of obesity in early childhood, as
45 well as counteract the social stigma attached to obesity, in order to improve the effectiveness
46 of family-based interventions to manage obesity in early childhood.
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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.

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66 INTRODUCTION

67

68 While there is growing evidence of the superior effectiveness of lifestyle interventions
69 initiated early in childhood¹⁻³, 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 ages⁴⁻⁶. 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 level⁷. 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.⁸

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 conclusively⁶. To date, only two studies^{9 10} 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 environment⁹. 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 95th percentile. These parents, notably, were
88 aware of obesity related health risks¹⁰. More recently, focus groups revealed that, in assessing
89 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 is¹¹.

So far, existing research on parental perceptions of children's body weights has focused almost exclusively on mothers, and has not examined the critical influence of other family members, such as fathers and grandparents¹². Because family-based interventions have been proposed as the most effective approach to treating child obesity^{13 14}, knowledge about how other adult caretakers perceive and discuss young children's body weights will contribute to understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-judgmental communication about children's eating practices and body sizes is important for the prevention of body dissatisfaction and disordered eating in childhood and adolescence^{15 16}.

To examine caretakers' perceptions of young children's body weights from a broader familial perspective, we designed this study to include family sets of parents and grandparents actively involved in taking care of preschool age children. While investigating communication about food and physical activity among parents and grandparents of preschoolers was the main aim of the study, the participants' perceptions of children's body weights were essential to the study. All participants answered several questions about this topic, resulting in rich and unique material. Given this, we found that this topic merited dedicated discussion, apart from the larger study. As childhood obesity remains high among families with low socioeconomic status¹⁷⁻¹⁹, and as it is more difficult to recruit and retain these families in intervention programs^{20 21}, we chose to target a low income population.

METHODS

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114 Families of children aged 3-5 years from the Pacific Northwest (Eugene and Springfield
115 metropolitan area, Oregon) were recruited in February – May 2011 through advertisements
116 about the study, published in a local newspaper and the volunteers’ and job seekers’ sections
117 of Craigslist (the most widely used classified advertisement website in the United States). The
118 active involvement of grandparents in family life (defined as spending time with the
119 grandchild at least twice a month) was the primary criterion for inclusion in the study.
120 Consequently, only families in which at least one parent and one grandparent were willing to
121 be interviewed were included in the study. The other inclusion criteria specified that the
122 child’s age must be between 3-5 years, and that the child should have no underlying medical
123 condition or disability which would affect his/her weight. All families who contacted the
124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.
125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.
126 When the participants first met with the researchers, and before the interviews took place, the
127 researchers verbally explained the informed consent forms to each participant, and answered
128 any questions participants had. If the parents/grandparents agreed to participate, they were
129 asked to read and sign the written project description and project consent forms. The families
130 received a copy of the written study description and informed consent forms.
131
132 Parents and grandparents were interviewed separately at the Oregon Social Learning Center.
133 Free child care was provided on site, and the children were not present during the interviews.
134 Each interviewed participant received compensation of \$50 for participating in the study.
135 Prior to the interview, parents and grandparents completed a comprehensive
136 sociodemographic questionnaire routinely used in research projects involving families at the
137 Oregon Social Learning Center; the questionnaire included items concerning family
138 composition, parental education, employment status, and living conditions. All the

139 interviewed parents and grandparents as well as the preschooler in focus had their height and
140 weight measured, without shoes and wearing only light clothing, by trained research staff
141 prior to the interviews. The interviews, which were conducted by a single researcher (either
142 the second or the last author), lasted 1.5-2.5 hours and explored the different roles of family
143 members in shaping a child's lifestyle. Before coding, all participant names were changed to
144 ensure confidentiality.

145

146 This paper focuses on the parents' and grandparents' perceptions of young children's body
147 weights, with particular emphasis on overweight and obesity, parental responsibility for
148 childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body
149 weights. The main questions are summarized in Table 1.

150

151 *Insert Table 1 here.*

152

153 It should be noted that while all participants were asked the same main questions, the
154 interview process allowed for fluidity, and follow-up questions were adapted according to
155 each participant's responses. Additionally, while the majority of data directly refer to the main
156 questions listed, the present analysis includes pertinent comments the participants made
157 throughout the interviews. The interviews were videotaped and transcribed in full;
158 videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this
159 paper, transcript sections that related to the main questions were extracted and collated. The
160 transcripts were then coded independently by the first and the last author, using a thematic
161 discourse analysis approach. Discourse analysis is concerned with people's use of language to
162 describe and make sense of their realities, and is an appropriate approach for qualitative
163 studies that examine people's definitions of and spoken attitudes towards health issues²².

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Thematic analysis facilitates the identification of patterns in qualitative data, and therefore allowed the researchers to delineate themes across the data set²³. Over several in-person meetings and email correspondence, the two coders compared and discussed their codes, to examine and resolve potential disagreements, and reach consensus on the clustering of codes into themes and on the grouping of themes under thematic categories.

RESULTS

In total, 49 family members (70% female) from sixteen families were interviewed. The sample included 22 parents and 27 grandparents – subsample sizes suitable for data saturation²⁴. Seven families consisted of single parent with sole responsibility for the child (five single mothers and two single fathers). In ten families, only one grandparent was interviewed; in two families, two grandparents were interviewed; in three families, three grandparents were interviewed; and in one family, four grandparents were interviewed. In five of the families, all grandparents who had contact with the grandchild were interviewed. The most common reason for not being able to include full sets were the other grandparents’ residing outside the study area.

Participants’ characteristics are summarized in Table 2. All data refer to parents and grandparents who were interviewed as part of the study. Due to the targeted recruitment process (ads in job advertisement sections) the sample displayed low levels of education and income; as many as 50% of parents were unemployed. The majority of children, parents and grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific Northwest.

188 All the interviewed parents and grandparents as well as the preschooler in focus had their
189 height and weight measured, without shoes and wearing only light clothing, by trained
190 research staff prior to the interviews. These measurements were taken in order to
191 contextualize the participants' stated perceptions of and attitudes toward childhood
192 overweight/obesity and associated lifestyle factors. In most cases, the researcher who took the
193 participants' weight and height measurements also interviewed them. However, this did not
194 influence the study, as the participants' and the children's BMI statuses were not calculated
195 prior to the interviews, so as not to bias the interview process. Thus, the interviewers and the
196 participants were not informed about the child's or any of the adult family members' weight
197 status. The interviewers were informed about the participants' and the children's weight
198 statuses following the interviews; the participants were not informed about their own or their
199 children's weight statuses. More than half of parents and two thirds of grandparents had
200 overweight or obesity, according to World Health Organization criteria²⁵. Of the children,
201 56% were either overweight or obese (overweight: 85th percentile < Body Mass Index (BMI)
202 < 95th percentile; obesity: BMI ≥ 95th percentile)²⁶⁻²⁸; those five who were categorized as
203 obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.

204

205 *Insert Table 2 here.*

206

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

218
219 *Insert Tables 3-6 here.*

220
221
222 **Perceptions of young children’s body sizes (Table 3)**

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

235
236 **Perceptions of the timeline of obesity (Table 4)**

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 99th 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 exercise habits are important because they translate into 'long lasting effects' and 'hav[ing] more trouble as an adult'.

Perceptions of parental responsibility and blame for childhood obesity (Table 5)

The participants identified parents as bearing primary responsibility for their children's eating and exercise habits and for their body weights. Even those participants who spoke of body size as being affected by genetics asserted that parents can still influence their children's body weights. Likewise, participants who mentioned that children may be overweight or obese due to a health condition (e.g. glandular dysfunction) said that parents are responsible for making sure the child's medical problem is identified and resolved. The participants argued that parents are responsible for children's body weights because they can control what their children eat, provide a healthy food environment at home, encourage their children to play outside and be active, and model healthy behaviors themselves.

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261 The participants’ concepts of parental responsibility linked with their attitudes towards
262 parental blame for childhood obesity. Several participants said they ‘judged’ parents whose
263 children were obese; some even said that the parents of obese children were guilty of child
264 neglect or abuse. Participants identified childhood obesity as being transmitted from one
265 generation to the next, and as the result of ‘lazy’ parenting. Having an obese child was an
266 outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling
267 blamed by clinicians for the child’s weight gain, which, as she said, neither she nor the child’s
268 clinicians could explain.

269
270
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.

284

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

296

297

298 DISCUSSION

299

300 This study's findings suggest that the parents and grandparents of preschool age children face
301 difficulties in identifying and discussing their preschoolers' overweight and obesity. Previous
302 research has found that low income mothers are not concerned about preschoolers'
303 overweight because they attribute body weight to genetic heredity⁹. However, in this study,
304 the participants strongly endorsed the idea that parents bear primary responsibility for their
305 children's eating and exercise habits and body weights. Nevertheless, the participants did not
306 speak of their own children or grandchildren as overweight or obese. Notably, the
307 participants' responses were consistent across the sample, and no generational differences
308 were observed between the parents' and the grandparents' perceptions of their preschoolers'
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 al⁹, 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 al¹¹,

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 al¹⁰. Although they were aware of their preschoolers’ growth chart

334 percentiles, most participants did not link these percentiles with the categories of ‘overweight’

335 and 'obesity'. Likewise, although participants were aware of the health risks associated with
336 obesity in adulthood, they did not link their preschoolers' body weights with potential
337 problems in the present tense.

338

339 While the participants did not associate obesity with early childhood, they did take
340 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise
341 practices. Along similar lines, however, the participants – including some whose children
342 were classified as obese –blamed parents for childhood obesity. The participants' expressions
343 of judgment toward the parents of obese children were aligned with broader social stigma
344 attached to obesity^{29 30}. Given the participants' stigmatizing attitudes, it is not surprising that
345 they did not discuss their preschoolers' body weights with other family members. Although
346 parents and grandparents did discuss children's body sizes through comments on how 'big',
347 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were
348 classified as overweight or obese did not discuss their body weights with family members,
349 except when there was a perceived health problem. It is possible that, for the participants,
350 discussion of body weight threatened to expose both themselves and their children to the risk
351 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is
352 important to note that, in deciding not to discuss body weight with their preschoolers (unless
353 the children themselves raised the topic), the participants protected the children's body image
354 and self-esteem. Moreover, like the parents described by Andreassen et al ³¹, those parents
355 who recognized their children needed to lose weight attempted to enact weight loss strategies
356 without explicitly mentioning weight. As previous studies have shown, parental comments
357 about body weight are associated with body dissatisfaction and reduced self-esteem in
358 children^{15 32 33}, such that the participants' stance on avoiding 'weight talk' with children was
359 positive. In cases where children are enrolled in clinical treatment programs for obesity

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360 management, however, it is important that clinicians, parents, and grandparents identify
361 sensitive and supportive ways of framing the topic of body weight. A recent study has
362 proposed a set of guidelines to help parents discuss body image and eating with preschool
363 aged children in a supportive way that is protective of children’s self-esteem¹⁶.
364
365 The results of this study suggest that there are important gaps between clinical definitions and
366 lay perceptions of childhood obesity. While parents and grandparents are aware of their
367 preschoolers’ growth chart percentiles, these measures do not translate into recognition of
368 young children’s overweight or obesity. Without visual examples of how a preschool age
369 child with overweight or obesity might look, such as sketched silhouettes or photographs at
370 different weight categories³⁴⁻³⁶, parents and grandparents continue to speak of children’s
371 excess weight as ‘cute’ or ‘healthy’, and perceive obesity as problematic only in later
372 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss
373 young children’s body weights with the children and with one another, this might affect the
374 success of clinical interventions for childhood obesity, in which children’s caretakers are
375 forced into a new and uncomfortable discussion.
376
377 The clinical implications of this study include several components. In discussions with parents
378 and grandparents of preschool age children, clinicians should clarify how children’s fat
379 distribution and body sizes typically change with age. Clinicians should also speak with
380 children’s caretakers about the meaning of growth chart percentiles, and provide visual
381 examples of how children might look in each of the percentile categories. Moreover,
382 clinicians should emphasize the immediate problems associated with obesity in early
383 childhood, such as hypertension (present in more than 50% of children with obesity),
384 dyslipidemia, motor skill development and orthopedic complications³⁷⁻³⁹.

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 condition⁴⁰. 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^{5 18 30}, 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 standards²⁴. 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.

435

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440

441 CONTRIBUTORSHIP STATEMENT

442 Karin Eli: Dr Eli coded the interviews and analyzed them together with Dr Nowicka, wrote

443 the manuscript, and approved the final manuscript as submitted.

444 Kyndal Howell: Ms Howell coordinated the data collection, critically reviewed the

445 manuscript, and approved the final manuscript as submitted.

446 Philip A. Fisher: Professor Fisher contributed to the design of the study, critically reviewed

447 the manuscript and approved the final manuscript as submitted.

448 Paulina Nowicka: Dr Nowicka conceptualized and designed the study, coordinated and

449 supervised data collection and analysis, coded the interviews and analyzed them together with

450 Dr Eli, critically reviewed the manuscript and approved the final manuscript as submitted.

451 COMPETING INTERESTS

452 We have read and understood BMJ policy on declaration of interests and declare that we have

453 no competing interests.

454

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458 03443).

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DATA SHARING

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

For peer review only

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.
9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics* 2001;107(5):1138-46.
10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of health status and play activities in parents of overweight Hispanic toddlers and preschoolers. *Fam Community Health* 2005;28(2):130-41.
11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes (Lond)* 2011;35(7):953-62.
12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding healthy behaviours for preventing overweight and obesity in young children: a systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009(1):CD001872.
14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body dissatisfaction and unhealthy eating patterns in preschool children: A Delphi consensus study. *Body Image* 2014;11(4):418-25.
17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in body weight of German children reverse direction between the ages of 2 and 6 years. *J Nutr* 2003;133(3):789-96.

18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity among young U.S. children living in low-income families, 2008-2011. *Pediatrics* 2013;132(6):1006-13.

19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development of socioeconomic inequalities in obesity among Dutch pre-school and school-aged children *Obesity (Silver Spring)* 2014;In press

20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.

21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al. Strategies for Recruitment and Retention of Families from Low-Income, Ethnic Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child Weight. *Child Health Care* 2013;42(3):198-213.

22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.

23. Braun V, Clarke V. Using thematic analysis in psychology. . *Qualitative Research in Psychology* 2006;3(2):77-101.

24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59-82.

25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. . *World Health Organ Tech Rep Ser*, 2000:1-253.

26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. *Adv Data* 2000(314):1-27.

27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 CDC Growth Charts for the United States: methods and development. *Vital Health Stat 11* 2002(246):1-190.

28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.

29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull* 2007;133(4):557-80.

30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)* 2009;17(5):941-64.

31. 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.

32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old girls. *Pediatrics* 2001;107(1):46-53.

33. 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.

34. 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.

35. Warschburger P, Kroller K. Maternal perception of weight status and health risks associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.

36. 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.

37. 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.

38. 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.
39. 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.
40. Puhl RM, Heuer CA. Obesity stigma: important considerations for public health. *Am J Public Health* 2010;100(6):1019-28.

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?
If yes, what lifestyle choices do you think are the most important? How/when do you think they can be promoted, and who do you think can do that? And who in the family plays the most important role when it comes to influencing the child's weight?
If no, what makes you think that way?
 3. What do you think about your child's (or grandchild's) weight? (As compared to his/her siblings, cousins, other children, to the child's parents. Are you concerned/not concerned?)
 4. What do you think that the parents of your grandchild think about your grandchild's weight (or grandparents of your child about your child's weight)? (Examine: If there are two parents (grandparents) in the house, do they have the same opinion?)
 5. Do you talk about your child (grandchild's) weight with his/her grandparents (parents)? (If yes, why, how? If not, why? Examine: If there are two parents in the house, which of them do you talk the most with and why?)
 6. Do you know if your child (grandchild) thinks about his/her weight? (Probe: Does he/she ever comment on it? Did that happen in your presence? If yes, what did you 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 %)

* The main reasons for unemployment among parents were child care, pursuing higher education, and not finding work; among grandparents, unemployment was due to not finding 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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Table 4. Examples of participants' quotes on perceptions of the timeline of obesity.

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

4.3 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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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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<i>Theme 7: Parents have control over children's eating, physical activity, and body weights</i>	
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.
<i>Theme 8: The parents of obese children are blamed by themselves and by others</i>	
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 <i>The Biggest Loser</i> 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 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.

12.7 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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“A ~~little~~ Little on the ~~heavy~~ Heavy ~~side~~ 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 parents and grandparents' perceptions of preschoolers' body sizes. Interview questions also explored perceptions of 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 [a classified website \(Craigslist\)](#) and [in a local newspaper](#)s. 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.

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.

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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.

INTRODUCTION

While there is growing evidence of the superior effectiveness of lifestyle interventions initiated early in childhood¹⁻³, 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 ages⁴⁻⁶. 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 level⁷. 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 weight.⁸

Most studies have applied a quantitative approach to describe parents' miscategorization of children's weight status; however, the underlying factors have not been identified conclusively⁶. To date, only two studies^{9 10} 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, moreover, distrusted pediatric growth charts, and attributed childhood obesity to genetics, rather than to factors modifiable in the home environment⁹. 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 95th percentile. These parents, notably, were aware of obesity related health risks¹⁰. 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 is¹¹.

So far, existing research on parental perceptions of children's body weights has focused almost exclusively on mothers, and has not examined the critical influence of other family members, such as fathers and grandparents¹². Because family-based interventions have been proposed as the most effective approach to treating child obesity^{13 14}, knowledge about how other adult caretakers perceive and discuss young children's body weights will contribute to understanding familial barriers to treatment. Moreover, the fostering of sensitive and non-judgmental communication about children's eating practices and body sizes is important for the prevention of body dissatisfaction and disordered eating in childhood and adolescence^{15 16}.

To examine caretakers' perceptions of young children's body weights from a broader familial perspective, we designed this study to include family sets of parents and grandparents actively involved in taking care of preschool age children. While investigating communication about food and physical activity among parents and grandparents of preschoolers was the main aim of the study, the participants' perceptions of children's body weights were essential to the study. All participants answered several questions about this topic, resulting in rich and unique material. Given this, we found that this topic merited dedicated discussion, apart from the larger study. As childhood obesity remains high among families with low socioeconomic status¹⁷⁻¹⁹, and as it is more difficult to recruit and retain these families in intervention programs^{20 21}, we chose to target a low income population.

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
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17 119 grandchild at least twice a month) was the primary criterion for inclusion in the study.
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19 120 Consequently, only families in which at least one parent and one grandparent were willing to
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21 121 be interviewed were included in the study. The other inclusion criteria specified that the
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23 122 child’s age must be between 3-5 years, and that the child should have no underlying medical
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25 123 condition or disability which would affect his/her weight. All families who contacted the
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27 124 study coordinator and were found to fulfill the inclusion criteria were recruited to the study.
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29 125 The study was approved by the Internal Review Board of the Oregon Social Learning Center.
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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
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35 128 any questions participants had. If the parents/grandparents agreed to participate, they were
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37 129 asked to read and sign the written project description and project consent forms. The families
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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.
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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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interviewed parents and grandparents as well as the preschooler in focus had their height and weight measured, without shoes and wearing only light clothing, by trained research staff prior to the interviews. ~~The weight status using height and weight was not calculated prior the interview, thus the interviewer and the family members were not informed about the child's or family members' weight status.~~ The interviews, which were conducted by a single researcher (either the second or the last author), lasted 1.5-2.5 hours and explored the different roles of family members in shaping a child's lifestyle. Before coding, all participant names were changed to ensure confidentiality.

This paper focuses on the parents' and grandparents' perceptions of young children's body weights, with particular emphasis on overweight and obesity, parental responsibility for childhood obesity, and contexts in which parents and grandparents discuss preschoolers' body weights. The main questions are summarized in Table 1. ~~were: (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? If yes, what lifestyle choices do you think are the most important? How/when do you think they can be promoted, and who do you think can do that? And who in the family plays the most important role when it comes to influencing the child's weight? If no, what makes you think that way? (3) What do you think about your child's (or grandchild's) weight? As compared to his/her siblings, cousins, other children, to the child's parents. Are you concerned/not concerned? (4) What do you think that the parents of your grandchild think about your grandchild's weight (or grandparents of your child about your child's weight)? Examine: If there are two parents (grandparents) in the house, do they have the same opinion? (5) Do you talk about your child (grandchild's) weight with his/her grandparents (parents)? If yes, why, how? If not, why? Examine: If there are two parents in the house, which of them do you talk the most with and why? (6) Do you know if~~

~~your child (grandchild) thinks about his/her weight? Probe: Does he/she ever comment on it?~~
~~Did that happen in your presence? If yes, what did you say? If your child doesn't think about~~
~~his/her weight, is it good or bad?~~

Insert Table 1 here.

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It should be noted that while all participants were asked the same main questions, the interview process allowed for fluidity, and follow-up questions were adapted according to each participant's responses. Additionally, while the majority of data directly refer to the main questions listed, the present analysis includes pertinent comments the participants made throughout the interviews. The interviews were videotaped and transcribed in full; videotaping allowed for the inclusion of non-verbal expressions in the transcriptions. For this paper, transcript sections that related to the main questions were extracted and collated. The transcripts were then coded independently by the first and the last author, using a thematic discourse analysis approach. Discourse analysis is concerned with people's use of language to describe and make sense of their realities, and is an appropriate approach for qualitative studies that examine people's definitions of and spoken attitudes towards health issues²². Thematic analysis facilitates the identification of patterns in qualitative data, and therefore allowed the researchers to delineate themes across the data set²³. Over several in-person meetings and email correspondence, the two coders compared and discussed their codes, to examine and resolve potential disagreements, and reach consensus on the clustering of codes into themes and on the grouping of themes under thematic categories.

RESULTS

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

198 Participants' characteristics are summarized in Table 42. All data refer to parents and
199 grandparents who were interviewed as part of the study. Due to the targeted recruitment
200 process (ads in job advertisement sections) the sample displayed low levels of education and
201 income; as many as 50% of parents were unemployed. The majority of children, parents and
202 grandparents were Caucasian, reflecting the ethnicity profile of this region of the Pacific
203 Northwest.

205 All the interviewed parents and grandparents as well as the preschooler in focus had their
206 height and weight measured, without shoes and wearing only light clothing, by trained
207 research staff prior to the interviews. These measurements were taken in order to
208 contextualize the participants' stated perceptions of and attitudes toward childhood
209 overweight/obesity and associated lifestyle factors. In most cases, the researcher who took the
210 participants' weight and height measurements also interviewed them. However, this did not
211 influence the study. The as the participants' and the children's BMI statuses were not
212 calculated prior to the interviews, so as not to bias the interview process. Thus, the

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interviewers and the participants were not informed about the child's or any of the adult family members' weight status. The interviewers were informed about the participants' and the children's weight statuses following the interviews; the participants were not informed about their own or their children's weight statuses. More than half of parents and two thirds of grandparents had overweight or obesity, according to World Health Organization criteria²⁵. Of the children, 56% were either overweight or obese (overweight: 85th percentile < Body Mass Index (BMI) < 95th percentile; obesity: BMI ≥ 95th percentile)²⁶⁻²⁸; those five who were categorized as obese were in the 95th, 96th, 98th (two children) and 99th percentiles for their BMI.

Insert Table ~~1~~2 here.

The analysis yielded twelve major themes, clustered under four thematic categories: Perceptions of young children's body sizes, perceptions of the timeline of obesity, perceptions of parental responsibility and blame for childhood obesity, and perceptions of appropriate contexts for speaking about preschoolers' body weights. While the number of fathers was not high enough to enable an assessment of differences between fathers' and mothers' perceptions and attitudes, there did not appear to be gender differences in participants' accounts. Furthermore, no generational differences were observed between the parents' and the grandparents' perceptions of their preschoolers' body sizes.~~While the number of fathers was not high enough to enable an assessment of differences between fathers' and mothers' perceptions and attitudes, it is possible to say that 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.~~ Examples of participant quotes from each of the thematic categories and their constituent themes are presented in table

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

Insert Tables ~~23-56~~ here.

Perceptions of young children's body sizes (Table ~~23~~)

None of the participants used the words 'obese' or 'overweight' to describe the preschoolers ~~who were later identified 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 (99th 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 (>90th 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 ~~34~~)

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

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negatively affects the child’s health, activities, behaviors, or mood. However, only one participant, whose child was in the 99th 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 exercise habits are important because they translate into ‘long lasting effects’ and ‘hav[ing] more trouble as an adult’.

Perceptions of parental responsibility and blame for childhood obesity (Table 45)

The participants identified parents as bearing primary responsibility for their children’s eating and exercise habits and for their body weights. Even those participants who spoke of body size as being affected by genetics asserted that parents can still influence their children’s body weights. Likewise, participants who mentioned that children may be overweight or obese due to a health condition (e.g. glandular dysfunction) said that parents are responsible for making sure the child’s medical problem is identified and resolved. The participants argued that parents are responsible for children’s body weights because they can control what their children eat, provide a healthy food environment at home, encourage their children to play outside and be active, and model healthy behaviors themselves.

The participants’ concepts of parental responsibility linked with their attitudes towards parental blame for childhood obesity. Several participants said they ‘judged’ parents whose children were obese; some even said that the parents of obese children were guilty of child neglect or abuse. Participants identified childhood obesity as being transmitted from one generation to the next, and as the result of ‘lazy’ parenting. Having an obese child was an

outward sign of ‘failing’ as a parent, and one mother whose child was obese spoke of feeling blamed by clinicians for the child’s weight gain, which, as she said, neither she nor the child’s clinicians could explain.

Perceptions of appropriate contexts for speaking about preschoolers’ body weights

(Table 56)

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. Some participants cited their preschoolers’ ‘apparent ‘comfort’ with – or lack of self-consciousness about – their bodies 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, ~~excepting the parents of the two children with the height weight statuses,~~ all parents, ~~with the exception of two,~~ avoided discussing their children’s body weights not only with the children themselves, but also with the children’s grandparents; likewise, excepting one grandmother, all 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

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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 heredity⁹. 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 ⁹, the authors of the present study suggest that most participants used these words not as euphemisms, as underscored by the participants’ consistent descriptions of

children's higher body weights in positive terms – as 'cute' or 'healthy'. While participants said that preschoolers' body weights would be problematic if the child became 'visibly overweight', it was less clear how a 'visibly overweight' preschooler might look. The participants' discussions focused, instead, on signs that might negate 'visible overweight' in a preschooler, including tallness, muscularity, and physical strength. As noted by Jones et al¹¹, when participants described obesity, it was through extreme cases of morbid obesity in later childhood or adulthood, with some citing examples of older children who were 'miniatures of their parents' and contestants on *The Biggest Loser* who weighed 400 lbs. Future research should explore how a 'visibly overweight' preschooler might look to parents and grandparents.

Just as the participants visualized obesity through images of older children or adults, they also spoke of obesity as a problem that might affect children later in life, but not in preschool age. Participants spoke of suffering from teasing as a school age child, or from poor health as an adult, as the consequences that marked obesity as a problem. While participants did say that they would recognize a body weight problem if their preschoolers showed negative changes in behavior, activity, and mood, they did not name immediate health risks. The participants' depictions of obesity revealed a disconnect between knowledge and perception, previously shown by Rich et al¹⁰. Although they were aware of their preschoolers' growth chart percentiles, most participants did not link these percentiles with the categories of 'overweight' and 'obesity'. Likewise, although participants were aware of the health risks associated with obesity in adulthood, they did not link their preschoolers' body weights with potential problems in the present tense.

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362 While the participants did not associate obesity with early childhood, they did take
363 responsibility for their preschoolers' body weights, and endorsed healthy eating and exercise
364 practices. Along similar lines, however, the participants – including some whose children
365 were classified as obese –blamed parents for childhood obesity. The participants' expressions
366 of judgment toward the parents of obese children were aligned with broader social stigma
367 attached to obesity^{29 30}. Given the participants' stigmatizing attitudes, it is not surprising that
368 they did not discuss their preschoolers' body weights with other family members. Although
369 parents and grandparents did discuss children's body sizes through comments on how 'big',
370 'strong', 'healthy', or 'muscular' they were, most participants whose preschoolers were
371 classified as overweight or obese did not discuss their body weights with family members,
372 except when there was a perceived health problem. It is possible that, for the participants,
373 discussion of body weight threatened to expose both themselves and their children to the risk
374 of blame, reduced self-esteem, and stigma attached to obesity. At the same time, it is
375 important to note that, in deciding not to discuss body weight with their preschoolers (unless
376 the children themselves raised the topic), the participants protected the children's body image
377 and self-esteem. Moreover, like the parents described by Andreassen et al ³¹, those parents
378 who recognized their children needed to lose weight attempted to enact weight loss strategies
379 without explicitly mentioning weight. As previous studies have shown, parental comments
380 about body weight are associated with body dissatisfaction and reduced self-esteem in
381 children^{15 32 33}, such that the participants' stance on avoiding 'weight talk' with children was
382 [positive. In cases where children are enrolled in clinical treatment programs for obesity](#)
383 [management, however, it is important that clinicians, parents, and grandparents identify](#)
384 [sensitive and supportive ways of framing the topic of body weight.](#) A recent study has
385 proposed a set of guidelines to help parents discuss body image and eating with preschool
386 aged children in a supportive way that is protective of children's self-esteem¹⁶.

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388 The results of this study suggest that there are important gaps between clinical definitions and

389 lay perceptions of childhood obesity. While parents and grandparents are aware of their

390 preschoolers' growth chart percentiles, these measures do not translate into recognition of

391 young children's overweight or obesity. Without visual examples of how a preschool age

392 child with overweight or obesity might look, such as sketched silhouettes or photographs at

393 different weight categories³⁴⁻³⁶, parents and grandparents continue to speak of children's

394 excess weight as 'cute' or 'healthy', and perceive obesity as problematic only in later

395 childhood or adulthood. Moreover, as parents and grandparents find it difficult to discuss

396 young children's body weights with the children and with one another, this might affect the

397 success of clinical interventions for childhood obesity, in which children's caretakers are

398 forced into a new and uncomfortable discussion.

399

400 The clinical implications of this study include several components. In discussions with parents

401 and grandparents of preschool age children, clinicians should clarify how children's fat

402 distribution and body sizes typically change with age. Clinicians should also speak with

403 children's caretakers about the meaning of growth chart percentiles, and provide visual

404 examples of how children might look in each of the percentile categories. Moreover,

405 clinicians should emphasize the immediate problems associated with obesity in early

406 childhood, such as hypertension (present in more than 50% of children with obesity),

407 dyslipidemia, motor skill development and orthopedic complications³⁷⁻³⁹.

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409 The results also suggest that the countering of stigma should be an important part of the

410 clinical management of childhood obesity. Given the social stigma and blame attached to

411 parents of children with obesity, parents might contest a child's obesity diagnosis and be

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412 reluctant to take part in interventions to manage their child’s condition⁴⁰. It is therefore crucial
413 that clinicians directly address stigma when they speak to parents, emphasizing that childhood
414 obesity is not the parents’ fault, and that managing this condition together is a positive step.
415 Similarly, clinicians should avoid addressing parents of children with obesity in ways that
416 might make them feel guilty or judged. Finally, it is important that clinicians frame
417 discussions of children’s body weights sensitively, and encourage parents and grandparents to
418 address children’s eating and physical activity practices through positive words and actions,
419 without emphasizing body weight to the children themselves.
420
421 This study had some limitations. While the sample was the largest ever reported in a
422 qualitative investigation of parents’ and grandparents’ perceptions and attitudes concerning
423 preschoolers’ body weights, the families were mainly of Caucasian origin, representing the
424 ethnic distribution of the population in Eugene and Springfield, Oregon. Thus, the influence
425 of cultural background on perceptions of children’s body sizes, which several studies have
426 identified as important^{5 18 30}, could not be investigated. As the study targeted families of low
427 socioeconomic status, further research is needed to determine whether the results can be
428 generalized to other populations. Additionally, as several participants were single mothers, the
429 number of fathers was not high enough to enable an assessment of differences between
430 fathers’ and mothers’ perceptions and attitudes. Finally, while a number of families had a full
431 or nearly-full set of grandparents participating, some had only one or two grandparents
432 participating, due to circumstances such as the other grandparents’ living outside the area.

434 **CONCLUSION**

435

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 standards²⁴. 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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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.

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DATA SHARING

Online supplementary table S1-4 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.
9. Jain A, Sherman SN, Chamberlin LA, Carter Y, Powers SW, Whitaker RC. Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics* 2001;107(5):1138-46.
10. Rich SS, DiMarco NM, Huettig C, Essery EV, Andersson E, Sanborn CF. Perceptions of health status and play activities in parents of overweight Hispanic toddlers and preschoolers. *Fam Community Health* 2005;28(2):130-41.
11. Jones AR, Parkinson KN, Drewett RF, Hyland RM, Pearce MS, Adamson AJ. Parental perceptions of weight status in children: the Gateshead Millennium Study. *Int J Obes (Lond)* 2011;35(7):953-62.
12. Pocock M, Trivedi D, Wills W, Bunn F, Magnusson J. Parental perceptions regarding healthy behaviours for preventing overweight and obesity in young children: a systematic review of qualitative studies. *Obes Rev* 2009;11(338-353).
13. Oude Luttikhuis H, Baur L, Jansen H, Shrewsbury VA, O'Malley C, Stolk RP, et al. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2009(1):CD001872.
14. Hoelscher DM, Kirk S, Ritchie L, Cunningham-Sabo L. Position of the Academy of Nutrition and Dietetics: interventions for the prevention and treatment of pediatric overweight and obesity. *J Acad Nutr Diet* 2013;113(10):1375-94.
15. Smolak L, Levine MP, Schermer F. Parental input and weight concerns among elementary school children. *Int J Eat Disord* 1999;25(3):263-71.
16. Hart LM, Damiano SR, Chittleborough P, Paxton SJ, Jorm AF. Parenting to prevent body dissatisfaction and unhealthy eating patterns in preschool children: A Delphi consensus study. *Body Image* 2014;11(4):418-25.
17. Langnase K, Mast M, Danielzik S, Spethmann C, Muller MJ. Socioeconomic gradients in body weight of German children reverse direction between the ages of 2 and 6 years. *J Nutr* 2003;133(3):789-96.
18. Pan L, May AL, Wethington H, Dalenius K, Grummer-Strawn LM. Incidence of obesity among young U.S. children living in low-income families, 2008-2011. *Pediatrics* 2013;132(6):1006-13.
19. Bouthoorn SH, Wijtzes AI, Jaddoe VW, Hofman A, Raat H, van Lenthe FJ. Development of socioeconomic inequalities in obesity among Dutch pre-school and school-aged children *Obesity (Silver Spring)* 2014;In press
20. Summerbell CD, Ashton V, Campbell KJ, Edmunds L, Kelly S, Waters E. Interventions for treating obesity in children. *Cochrane Database Syst Rev* 2003(3):CD001872.
21. Brannon EE, Kuhl ES, Boles RE, Aylward BS, Ratcliff MB, Valenzuela JM, et al. Strategies for Recruitment and Retention of Families from Low-Income, Ethnic Minority Backgrounds in a Longitudinal Study of Caregiver Feeding and Child Weight. *Child Health Care* 2013;42(3):198-213.
22. Starks H, Trinidad SB. Choose your method: a comparison of phenomenology, discourse analysis, and grounded theory. *Qual Health Res* 2007;17(10):1372-80.
23. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology* 2006;3(2):77-101.

24. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. *Field Methods* 2006;18(1):59-82.

25. Report of a WHO consultation. Obesity: preventing and managing the global epidemic. . *World Health Organ Tech Rep Ser*, 2000:1-253.

26. Kuczmarski RJ, Ogden CL, Grummer-Strawn LM, Flegal KM, Guo SS, Wei R, et al. CDC growth charts: United States. *Adv Data* 2000(314):1-27.

27. Kuczmarski RJ, Ogden CL, Guo SS, Grummer-Strawn LM, Flegal KM, Mei Z, et al. 2000 CDC Growth Charts for the United States: methods and development. *Vital Health Stat 11* 2002(246):1-190.

28. Krebs NF, Himes JH, Jacobson D, Nicklas TA, Guilday P, Styne D. Assessment of child and adolescent overweight and obesity. *Pediatrics* 2007;120 Suppl 4:S193-228.

29. Puhl RM, Latner JD. Stigma, obesity, and the health of the nation's children. *Psychol Bull* 2007;133(4):557-80.

30. Puhl RM, Heuer CA. The stigma of obesity: a review and update. *Obesity (Silver Spring)* 2009;17(5):941-64.

31. 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.

32. Davison KK, Birch LL. Weight status, parent reaction, and self-concept in five-year-old girls. *Pediatrics* 2001;107(1):46-53.

33. 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.

34. 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.

35. Warschburger P, Kroller K. Maternal perception of weight status and health risks associated with obesity in children. *Pediatrics* 2009;124(1):e60-8.

36. 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.

37. 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.

38. 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.

39. 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.

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

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?

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

If no, what makes you think that way?

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

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

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

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

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%)

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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 %)

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

Table 23. Examples of participants’ quotes on perceptions of young children’s body sizes.

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.

1.14 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.

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

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

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

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.

7.5 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.

Table 56. Examples of participants’ quotes on perceptions of appropriate contexts for speaking about preschoolers’ body weights.

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 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.

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

<i>Theme 1: Young children are ‘pudgy’ or ‘big for their age’, but not obese</i>
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

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

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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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 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 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.