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Mothers' views on portion sizes for children

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Abstract

Background: Childhood obesity has increased steadily over recent years and has coincided with a general trend towards larger portions of foods consumed both inside and outside the home. A causal link between portion size and weight gain has not been established, although there is evidence of an association between larger portions and greater energy intake. The present study aimed to investigate parent's attitudes, knowledge, practices, and concerns about appropriate portions for children.

Methods: Four focus groups with a total of 14 volunteer mothers of 8–11-year-old children taking part in a larger school-based study. Mothers were asked their views about portion sizes for their children and were asked to demonstrate typical servings that they would offer their children, by weighing five common foods provided. Conversations were tape-recorded and transcribed for thematic analysis.

Results: Participants were unconcerned about portion sizes and would not welcome official guidance, particularly if it involved weighing foods. Mothers fed their children the amount that they believed they would eat and felt that this varied across children and across occasions. The weighing task revealed a wide variation in portion sizes served to children, with portions of the more energy-dense foods being smaller on average than those of less energy-dense foods.

Conclusions: There was little understanding of age-appropriate serving sizes amongst mothers in this study. Education campaigns should be mindful of the need to make portion information clear and simple because parents may not be prepared to weigh the food that they serve to their children.

Introduction

The prevalence of childhood obesity has increased steadily over recent years (Lobstein & Frelut, 2003) and has coincided with a general trend towards larger portions of foods consumed both inside and outside the home (Nielsen & Popkin, 2003) in both children and adults. Although it is difficult to establish a causal relationship, it is plausible that ease of access to large portions of highly palatable, energy-dense foods may be promoting weight gain and obesity.

The majority of studies investigating portion size have focused on the relationship with energy intake. It is relatively well established that serving larger portions leads to increased energy intake in children and adults (Fisher *et al.*, 2007), although, in very young children, food intake may be relatively unaffected by portion size. Rolls *et al.* (2000) have shown that 3-year-old children consume a similar amount at a given meal regardless of portion size served, whereas, in 5-year-old children, there is a significant increase in energy intake with larger portions. However, Fisher *et al.* (2003) concluded that from the age of 3 years, children's energy intake is affected by portion size, although the magnitude of the effect increases with child age. In a further study, Fisher (2007) found that children as young as 2 years of age were affected by portion size. Taken together, these findings suggest that children under 2 years may have some innate ability to self-regulate their intake by responding to internal cues for hunger and satiety. As children get older, these internal cues appear to be overridden by external factors, leading them to overeat in an environment that offers numerous opportunities to snack on large portions of palatable foods (Birch & Fisher, 1998; McConahy *et al.*, 2004).

It is not clear why the amount of food offered has an increasing influence on children as they get older, but it has been suggested that early experiences may play an important role in explaining the portion size effect (Ello-Martin *et al.*, 2005). A study by Birch *et al.* (1987) demonstrated that the ability of preschool children to respond appropriately to physiological cues for hunger could be undermined by deliberately focusing their attention on external cues. It was found that, amongst 4-year-old children, those who were rewarded for eating all the food on their plates increased their energy intake, whereas those taught to focus on satiety cues consumed an appropriate amount of food. This suggests that parent feeding strategies that encourage children to finish all the food on their plate may result in children learning to eat in the presence of food rather than in the presence of hunger, which comprises an eating behaviour that might plausibly have long-term implications for weight regulation.

Most of the available evidence in adults and children suggests that the tendency to overeat when presented with large portions affects people of all weights and is not specific to heavier children and adults (Kral *et al.*, 2004; Fisher, 2007). However, recent research into associations between weight and portion size has yielded inconsistent findings. In a UK student sample, Brunstrom *et al.* (2008) found no evidence for such a relationship. This contrasts with the findings Burger *et al.* (2007) who observed a strong relationship between body mass index and large portion sizes for energy dense foods in a similar population from the USA. Obesity was also related to larger self-selected portion sizes in a sample of Swedish adults (Berg *et al.*, 2009) and Lioret *et al.* (2009) found some evidence of a link between meal portion size and increased body weight in children. Fisher & Kral (2007) suggested that the extent to which children are routinely exposed to large portions may be key in understanding the implications of portion size for children being overweight.

Despite evidence to suggest that young children consume significantly less when allowed to serve themselves (Fisher *et al.*, 2003), parents tend to play a central role in determining how much food their child will be given. Overall, there is evidence to suggest that portions consumed at home are increasing (Young & Nestle, 2002; Nielsen & Popkin, 2003; Smiciklas-Wright *et al.*, 2003). Because portion sizes have been found to significantly impact on energy intake by the end of the preschool period, it is important that parents are made aware of what is an appropriate amount of food to be offered. However, there appears to be a great deal of confusion in this area (Young & Nestle, 1995) and contributing to this is a lack of national guidance on appropriate portion sizes apart from those for fruit and vegetables (National Health Service).

Although it has been suggested that parents may make decisions about portion sizes on the basis of personal knowledge and beliefs, perceived norms and marketing practices (Rennie *et al.*, 2005; Wansink & van Ittersum, 2007), there is a lack of research directly investigating parents' views on portion sizes for children and factors influencing their beliefs and practices. One exception is a focus group study by Sherry *et al.* (2004), which revealed that mothers of 2–4-year-old children tended to determine portion sizes on the basis of simply knowing how much their children would, or needed to eat. However, several mothers in this study also expressed a desire for more information about age-appropriate portion sizes and guidance as to who should determine how much food is given to children.

Because most research in this area has been quantitative, the present study aimed for further understanding by employing a qualitative methodology to explore parents' views on portion sizes for children in more depth. Qualitative research seeks to understand a person's experiences and has been shown to be an effective method for examining beliefs, behaviour patterns and factors that influence how views and judgements are made (Crockett *et al.*, 1990; James *et al.*, 1996). The present study used focus group discussions to explore parental knowledge and concern about portion sizes for children and to consider factors influencing how judgements are made. An experimental participatory activity, in which parents were asked to demonstrate typical servings of various foods, was also employed to trigger discussion, supplement qualitative data and examine the degree of consistency in portion size estimation between individuals.

Materials and methods

Participants

Participants for the focus groups were drawn from a larger sample of parents of 6–7-year-old and 10–11-year-old children recruited for a previous study investigating the impact of giving feedback to parents about their child's weight. Full details of the recruitment procedure and sample characteristics are provided elsewhere (Grimmett *et al.*, 2008).

Parents of all children in Year 3 (6–7 years old) and Year 6 (10–11 years old) (n = 786) in participating schools in London were informed of the study by letter and invited to participate. Of the 786 parents invited to participate, written consent was obtained from 398 (51%). One hundred and sixty of these volunteered to take part in further research, of whom thirty, selected at random, were contacted by letter and followed up by a telephone call inviting them to take part in a group discussion about children's eating habits. A total of 14 parents agreed to take part in

the focus group study. Of these, seven had children aged 8 years (mean = 8.28 years) of whom three were male and four were female. The children of the remaining seven participants were 11 years of age (mean = 11.11 years) of whom five were female and two were male. Twelve participants were white British, one black British and one Asian. Five had Bachelor's degrees or higher, six had A levels or vocational qualifications and three had left school at the age of 16 years with O levels or GCSEs.

Data collection

The focus group protocol was designed by the research team and was based on issues raised in exploratory telephone interviews with other groups of parents about children's diets and healthy eating. The main aims were to obtain measures of typical portions of commonly consumed foods, using a practical weighing task and to more generally explore parents' views about children's portion sizes in group discussions. After introductions, the weighing task took place, followed by semi-structured questions and probes that were used to generate discussion and explore the parents' views in depth. The methodology employed allowed participants to engage in open discussion but ensured that the information gathered was relevant to the investigation and that comparisons could be made between groups. The full protocol for the focus groups is described in detail in Table 1.

The four focus groups were held with two to four randomly selected parents per group. A small number of participants were chosen for the focus groups to permit the inclusion of the weighing task (for a description of the method, see Table 1), which would be too time consuming in a larger group. The focus groups lasted an average of 90 min each and were conducted by the same two trained researchers.

Table 1 Protocol for focus group discussions

(1) Introduction and warm-up
Introductions.
Consent forms.
Ground rules: timing, allowing everyone to speak, confidentiality, etc.
Parents were asked to define a healthy diet for a child.
(2) Weighing task
Parents were presented with serving dishes of breakfast cereal, grated cheese, cooked pasta, cooked peas, and cooked chicken pieces. These foods were selected because they are foods commonly consumed by children, represent the four main food groups (starch, protein, dairy, and fruit/vegetables) and for practical reasons (ease of preparation).
Plates and bowls of varying sizes (to reflect those used at home) were available. Parents were asked to place the appropriate amount of each food item onto a plate or bowl to represent how much they would typically serve to their child at a meal.
The researcher weighed each of the portions using household weighing scales and recorded this.
(3) Exploration of views regarding food portions
How concerned are parents about the amount that their children eat?
Are they aware of any recommendations for portions sizes for children? Have parents ever been offered guidance regarding food portions? What was the nature of this and how helpful was it?
Do parents want further information about food portions? If so, what types of information and who would they want it from?
Do parents attempt to control the portion sizes that are given to children, and if so, how is this done? (Prompts if needed; who decides on the amount given at a meal, are second servings offered, does the child request second servings, what is the response to requests for second helpings).
How do parents make judgements about portion sizes? (Prompts if needed; prepackaged food, restaurant portions, own experiences, peers, child requests, etc.).
(4) Finishing up
Any further comments?
Thank you to focus participants and give booklets on healthy eating and physical activity as a thank you.

Analysis of focus group transcripts

Focus groups were audio-recorded with prior consent from the participants and transcribed verbatim by a trained typist. The resulting transcripts were checked for accuracy by one of the authors who had been present at the groups. Discussions of the main areas of interest (Table 1) were analysed for emerging themes by each of the authors, independently, using thematic analysis. Transcripts were read and issues raised and agreed upon by several members of the group were placed into a table, along with supporting quotes. This procedure was repeated for each focus group, allowing for comparison across groups. Key findings were defined as themes that were discussed most often and at greatest length by three or more focus groups. The authors met several times to review their findings and to reach a consensus on the main themes in each of the areas of interest. Supporting quotations were identified that were representative of discussions that occurred across groups.

Results

Defining a 'healthy diet'

Mothers strongly endorsed the importance of variety and balance as constituents of a healthy diet for children. There was general agreement that small quantities of fatty or sugary foods could be included in a healthy diet and most reported that they assessed the quality of their children's diet on a daily or weekly basis rather than by individual meals:

> For me, it's ensuring that on a daily basis over a week that I make sure that they don't have too many sweets, too much junk food.
>
> … and balance as well really. Everything in moderation.

A number of mothers stressed the particular importance of fruits and vegetables and were clearly aware of the 'five a day' public health message:

> Making sure that they've got five fruit and veg a day.
>
> Five fruit and veg would be the key thing for me.

Another widely endorsed aspect of healthy eating concerned regularity of mealtimes and most mothers considered planned snacks to be part of a desirable eating pattern:

> Three main and two snacks in between.
>
> Three meals a day … with not much in between.
>
> Healthy snacks as well.

Although having clear opinions about what a healthy diet is, the majority of mothers acknowledged the difficulty of achieving it:

> I think the whole thing about children and healthy eating personally is a bit of a battle.
>
> I don't find it's an easy job to get them all their veg and fruit.

Weighing task

Table 2 shows the means, standard deviations and ranges of portion size in grams and kilojoules of cereal, cheese, pasta, peas and chicken that the participants indicated they typically served to their children. There was considerable variation in weights of food served with the widest ranges being for pasta, peas and chicken. Levene's tests for homogeneity were significant [$P = 0.006$ for weight and $P = 0.007$ for kJ (kcal)] indicating the magnitude of these variances were significantly different. In addition, portions of the more energy dense foods (cereal and cheese) were smaller than those delivering less kJ g^{-1} (chicken, pasta and peas).

Beliefs and concerns regarding food portions

A number of themes arose during the focus group discussions on portion sizes. Key themes are discussed in relation to the main areas of interest outlined in Part 3 of the protocol. These centred around participants' concern about portion sizes, knowledge of recommendations, attitudes to receiving more information, control over portion sizes and methods used to judge appropriate servings.

Mothers were almost universally unconcerned about the issue of portion sizes:

> It is about combinations for me, so portion size is not that much of an issue.
>
> I think (whatever I) give them they will only have what they want to eat. Then portion size doesn't really come into it, does it?

However, one mother did express concern and implied that her child would continue to eat almost indefinitely if she were not prevented from doing so:

> With my daughter it's definitely about portions, because she'll eat until we say stop.

Awareness of recommendations

Most mothers did not know whether there were any recommended portion sizes for children, but at the same time did not appear to be especially concerned about this:

> I hadn't really got a clue about how much makes 30 g, or 60 g. You don't tend to weigh exactly how much you're giving.
>
> … you really don't know as a parent, do you? How much you should be giving the children. You kind of have a guess.

This lack of concern was reflected in attitudes towards the possible provision of more information about portion sizes. Mothers dismissed the idea and felt that more guidance would not be welcomed. Some mothers felt that they already received too much guidance and advice on parenting, and that information on weighing and measuring portions would not be helpful as this was not something that they would be prepared to do:

> You're given enough information what to do and what not to do.
>
> I don't know whether people would take much notice if they had to measure it.

Table 2 Portion size in grams and kJ (kcal) by food type from weighing task

Food type	Mean (SD) (g)	Range (g)	Mean (SD) kJ [kcal]	Range kJ (kcal)
Cereal	34.62 (17.73)	20–75	544.55 (278.95) [130.15 (66.67)]	314.64–1179.89 (75.2–282.0)
Cheese	24.31 (9.99)	10–48	418.02 (171.75) [99.91 (41.05)]	171.96–825.42 (41.1–197.28)
Pasta	116.92 (48.37)	50–220	777.85 (321.79) [185.91 (76.91)]	332.63–1463.56 (79.5–349.8)
Peas	63.93 (31.57)	25–145	184.56 (91.17) [44.11 (21.79)]	72.17–418.61 (17.25–100.05)
Chicken	99.29 (39.17)	30–160	635.59 (250.75) [151.91 (59.93)]	192.05–1024.24 (45.9–244.8)

Control over portion sizes

Despite a widespread disinterest in official portion size recommendations, it was clear that some of the mothers exerted considerable control over the amount of food that their children ate. A number of different methods were endorsed from covert strategies such as simply keeping potentially 'dangerous' foods out of the house, to using overt verbal commands:

> If I buy biscuits she will literally eat the whole packet so I just don't buy them.
>
> You don't buy what you don't want to eat.

In other families, children were given greater autonomy over their portion sizes:

> They serve themselves, but though we eat rice we don't eat too much of it.
>
> I think it's [portions] quite driven by the children.
>
> With pasta she would sometimes say: oh don't give me too much of that or I don't want loads or I can't eat all of that.

However, in this sample, decisions about portions were often made jointly by the parent and child. A number of the mothers suggested that they would often give their child a small amount of food to begin with and then allow them to have a second helping if they were still hungry afterwards:

> I give them smaller portions to begin with and then sometimes they ask for more.

In other cases, negotiations took place as food was being served:

> Last night when I put their food on their plates she said: oh you haven't given me enough. I said you can have one more piece of chicken but you're not having anything else. She was happy with that and she had an apple afterwards for pudding.

Judging appropriate portion sizes

Mothers talked about a variety of factors which they considered when deciding upon appropriate portion sizes for their children. The most frequently mentioned of these concerned the appetitive characteristics of the individual child itself. There was a widespread belief that all children are different and that the right amount for one particular child would be too much or too little for another:

> My (child's name) eats a quarter what (child's name) eats. But that has always been the case from day one.
>
> … some children eat even less than your own and you think I can't believe that. And then others come and eat adult portions.
>
> He has always been fussy with it being too much … I'd like him to eat a bit more. That is his kind of rebellion.

Not only did participants say that children differed from one another, but also their dietary needs differed from one time to another so that there was a need to be responsive rather than prescriptive at times:

> Sometimes she'll have Weetabix and then she'll have three or four, but then with her lunch she'll have one piece of bread and won't finish it.
>
> … if they are a bit off colour or tired or whatever (they eat less). Or a growth spurt (they eat more).

Mothers thought that the extent to which portion sizes needed to be controlled depended on the type of food concerned so that consumption of fruit was not restricted whereas quantities of less healthy foods would be limited:

> She likes fruit a lot so obviously there are no boundaries on fruit. And yoghurts. In fact, she does eat a lot of yoghurt before a meal.
>
> If grandma comes and there are sweets in her pocket, I give them one or so. Otherwise they'll eat so much if I don't control them.

Some mothers pointed out that the amount given at a particular mealtime would depend upon other food eaten during the day:

> … if your child is having lots of snacks and so on then perhaps they will eat a smaller portion in that family they'll be having lots of other bit and pieces in between.
>
> … it depends on what we are having and … on what we have eaten during the day

Others felt that portion sizes were a question of guesswork or intuition:

> You just have to guess and each child is different.

Discussion

The role of portion size in increasing energy intake in children is well established (Birch *et al.*, 1987; Rolls *et al.*, 2000), although the factors influencing parents' choice of children's portion sizes are unclear. This qualitative study explored mothers' attitudes, knowledge, practices and beliefs about portion sizes, both through focus group discussions and a practical food weighing task.

In defining the constituents of a healthy diet, mothers stressed the general importance of balance and variety with plentiful fruits and vegetables. Mothers believed that regular meals and minimal snacking was the ideal, but there was general agreement that these dietary goals are difficult to achieve. At this stage of the discussions, no parent mentioned appropriate portion sizes as an aspect of healthy eating.

When asked to demonstrate the quantity of various foods that they would serve to their children at a typical meal, wide variation was apparent: most notably for peas, chicken and pasta. The only widely publicised

portion size recommendation in the UK is that for fruit and vegetables (a portion being approximately 80 g) and is aimed at adults. The participants' average serving size of peas was less than this, at just under 64 g; however, children's dislike of vegetables (Cooke & Wardle, 2005) may be a more likely explanation for this than ignorance on the part of parents and it might be argued that this may, in fact, represent an adequate portion size for children of this age. Because guidelines are not available for other food types, the extent of variation observed is not surprising. Subsequent to our data being collected, a comprehensive assessment of portion sizes eaten by children aged from 18 months to 18 years has been published (Wrieden *et al.*, 2008). In the age group comparable with our sample (aged 7–10 years), serving sizes in grams were broadly similar, although their participants were served less peas (43 g versus 64 g), and chicken (67 g versus 99 g) and more pasta (130 g versus 116 g) and cheese (32 g versus 24 g). Average cereal portion sizes were identical, at 34 g. These differences may reflect the different socio-economic status profiles of our highly select sample compared to the National Survey samples. Aside from a lack of guidance, a further reason for wide variation in portion sizes may comprise the weight and activity level of the children concerned. This was not measured in the present study.

In subsequent discussions, parents' general lack of concern, indeed disinterest, in appropriate portion sizes was striking. There was a sense that parents already felt they were being bombarded with information about feeding their children, and there was consensus that, even if guidelines were available, these would be largely ignored because weighing and measuring food was not something that they would be prepared to do. Unlike the participants in the study by Sherry *et al.* (2004), there were no requests for advice on appropriate portion sizes for children. The findings of the present study may present a considerable problem for public health initiatives in this area because exhortations to UK parents to limit portion sizes may fall on deaf ears.

Despite the lack of interest in any official guidelines for portion sizes, parents were aware of the need to control portions to some extent. There was considerable variation in the degree of responsibility given to the child in determining portion size, with some mothers allowing their children to serve themselves and others exerting substantial control. One common strategy for controlling portions was to serve smaller amounts, and then allow second helpings if the child was still hungry.

In the absence of any particular interest or knowledge on whether there are recommended portion sizes for children, most parents appeared to make judgments on the basis of knowing the needs of their individual child. There was a general perception that there are fundamental individual differences in the amount of food required by different children. Parents appeared to judge portion sizes on their beliefs about their child's appetite, both in general and at the time of serving, recognising that this may fluctuate across food types and in accordance with previous intake over the course of the day. These findings are similar to those of Sherry *et al.* (2004) whose participants reported that they '… knew how much their children would or needed to eat'. Portion sizes were also determined by the nutritional status of the food being prepared, with healthier foods being viewed as more acceptable when given in larger amounts. Overall, parents felt that they generally used intuition and guess work in ensuring their child received a serving appropriate to their needs.

Conclusions from these data must be drawn with caution given the small sample of (presumably) highly-motivated participants contributing their views. Nevertheless, there was a high level of consensus on many issues, particularly in reactions to the prospect of official guidance on age-appropriate portion sizes, which were universally negative. Clearly, additional research in larger and more diverse samples would be desirable, although the findings of the present point to the important areas for further exploration.

Given that parents appear to be responding to feedback from their children in determining appropriate portion sizes, there is a need for parents to be made aware that children over 2 years of age may not always recognise when they are full and that serving bigger portions may result in increased energy intake (Fisher *et al.*, 2007). Parents appear to remain relatively ambivalent about portion sizes and are likely to be reluctant to heed advice recommending the weighing and measuring of food portions. The practical task illustrated the lack of consensus in parents' perceptions of appropriate portion sizes for children, which is hardly surprising given the absence of acceptable and accessible guidelines. Education campaigns should be mindful of the need to make portion information easy to understand and simple to follow because parents have neither the time, nor the inclination to weigh every item of food that they serve to their children. Further research should aim to seek the ideas and opinions of parents themselves regarding the best methods for guiding the public towards appropriate portion sizes for children and for effectively disseminating information about the relationship between portion size and energy intake.

Conflict of interest, source of funding and authorship

The authors declare that they have no conflict of interests.

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HC and LC designed the study and carried out data collection. All authors contributed to the analysis and interpretation of results and to writing the manuscript. All authors critically reviewed the manuscript and approved the final version submitted for publication.

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