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Parental perceptions of weight status in children: the Gateshead Millennium Study

Angela R Jones, PhD^a, Kathryn N Parkinson, PhD^a, Robert F Drewett, DPhil^b, Robert M Hyland, PhD^c, Mark S Pearce, PhD^d, Ashley J Adamson, PhD^a, and Gateshead Millennium Study core team*

^aInstitute of Health and Society, Human Nutrition Research Centre, Newcastle University, William Leech Building, Framlington Place, Newcastle upon Tyne, NE2 4HH, UK

^bDepartment of Psychology, Durham University, Science Laboratories, South Road, Durham, DH1 3LE, UK

^cSchool of Education, Durham University, Queen's Campus, University Boulevard, Stockton on Tees, TS17 6BH, UK

^dInstitute of Health and Society, Newcastle University, Sir James Spence Institute of Child Health, Royal Victoria Infirmary, Newcastle upon Tyne, NE1 4LP, UK

Abstract

Objectives—To investigate parents' perceptions of weight status in children and to explore parental understanding of and attitudes to childhood overweight.

Design—Questionnaires and focus groups within a longitudinal study.

Subjects—536 parents of Gateshead Millennium Study children, of which 27 attended 6 focus groups.

Main outcome measures—Parents' perception of their child's weight status according to actual weight status as defined by International Obesity Taskforce (IOTF) cut-offs. Focus group outcomes included parental awareness of childhood overweight nationally and parental approaches to identifying overweight children.

Results—The sensitivity of parents recognising if their child was overweight was 0.31. Prevalence of child overweight was underestimated: 7.3% of children were perceived as 'overweight' or 'very overweight' by their parents, 23.7% were identified as overweight or obese using IOTF criteria. 69.3% of parents of overweight or obese children identified their child as being of 'normal' weight. During focus groups parents demonstrated an awareness of childhood overweight being a problem nationally but their understanding of how it is defined was limited. Parents used alternative approaches to objective measures when identifying overweight in children such as visual assessments and comparisons with other children. Such approaches relied heavily on extreme and exceptional cases as a reference point. The apparent lack of relevance of childhood overweight to their child's school or own community along with scepticism towards both media

Corresponding author: Dr Angela R Jones, Institute of Health and Society, Human Nutrition Research Centre, Newcastle University, William Leech Building, Framlington Place, Newcastle upon Tyne, NE2 4HH, UK, Tel: +44 (0) 191 222 5276, Fax: + 44 (0) 191 222 5581, A.R.Jones@ncl.ac.uk.

*Gateshead Millennium Study core team: Ashley Adamson, Anne Dale, Robert Drewett, Ann Le Couteur, Paul McArdle, Kathryn Parkinson, Mark Pearce, John Reilly, Charlotte Wright

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messages and clinical measures commonly emerged as grounds for failing to engage with the issue at a personal level.

Conclusion—Parents' ability to identify when their child was overweight according to standard criteria was limited. Parents did not understand, use or trust clinical measures and used alternative approaches primarily reliant on extreme cases. Such approaches underpinned their reasoning for remaining detached from the issue. This study highlights the need to identify methods of improving parental recognition of and engagement with the problem of childhood overweight.

Keywords

Qualitative Research; Parents; Child; Perception; Overweight; Obesity

INTRODUCTION

Childhood overweight and obesity is a growing public health concern with significant implications for both immediate and long-term health.¹ Recent analyses of the Health Survey for England data found that the predicted prevalence of overweight and obesity in children aged 2-11 years in 2020 has fallen.² Despite these promising findings, childhood overweight and obesity remains an important public health issue and the identification of effective preventive strategies is urgently needed.

Potential for success in obesity prevention may lie with family-based interventions.³ Parents not only play an important role in the shaping of children's health related behaviours⁴ but are also relied upon to recognise unhealthy weight gain in their children and independently seek the appropriate support.⁵ A systematic review which reports a meta-analysis of parents' ability to identify their child's overweight status according to internationally recognised standards found, however, that in 19 out of 23 studies examined, less than 50% of parents correctly recognised their child was overweight.⁵ More recent reviews provide similar evidence.^{6, 7} Doolen *et al*⁶ further add that given the existence of such a clear disconnect in parental perceptions of child weight status it is necessary to explore why this phenomenon occurs.

The purpose of the present analysis was to examine parents' perceptions of weight status in both their own child and in children nationally and how these compare to child weight status according to a recognised body mass index (BMI) based standard. Our aim was to gain a greater understanding of parental perceptions and understanding of childhood overweight.

MATERIALS AND METHODS

Participants

Participants were children and parents from the longitudinal Gateshead Millennium Study (GMS). The children were recruited shortly after birth between 1999 and 2000 in Gateshead, an urban district in northeast England. All infants born to mothers resident in Gateshead in pre-specified weeks were eligible for recruitment. The study recruited 1029 infants, 82% of those eligible, and was comprised of largely white British children.⁸ Full details of recruitment and measures taken since birth are reported elsewhere.^{9, 10}

Procedure

At 6-8 years the children were visited at school where they completed questionnaires on food knowledge and eating behaviour. Data were also collected on their physical activity levels, dietary intake and a range of anthropometric measurements. Parents were visited at

home; they completed questionnaires on health and lifestyle related issues including their perception of their child's weight status and childhood overweight.

Following the collection of these data, parents were invited to register their interest in participating in the multi-stage qualitative aspect of the GMS. From this group participants were recruited to explore parental knowledge and perceptions of childhood overweight and potential strategies for intervention.

A favourable ethical opinion was obtained from Gateshead and South Tyneside Local Research Ethics Committee for this phase of the GMS.

Measures

Child Anthropometric Measures—Using equipment purchased from Chasmors, London, UK, height was measured to 0.1cm using a Leicester portable height measure with the head in the Frankfort plane, and weight to 0.1kg using Tanita scales TBF-300MA (TANITA Corporation, Tokyo, Japan).

Parental Perceptions—Parental perceptions of weight status in children were assessed using both quantitative and qualitative techniques. Parents' perception of their child's weight status was rated using the question 'How would you describe your child's weight at the moment?' (very underweight, underweight, normal, overweight, very overweight).¹¹ Parental perspectives of children's body weight at a societal level were examined using a question designed for this study: 'Do you feel concerned about the national rise in number of overweight children?' (yes, no, not sure).

Focus groups were conducted to explore and understand parental perceptions of weight status in children as previously described.¹² Prior to any discussion the purpose of the study was stated and participants were informed that the session would examine issues relating to overweight in children approximately the same age as the GMS children (primary range: 4-11 years). It was made clear that parents were not required to discuss their own children unless they wished to do so and that the term 'overweight' would be used to include all levels of overweight regardless of extent and other terms used elsewhere. Confidentiality and anonymity in any reporting was assured. Focus groups followed a semi-structured guide which incorporated activities to encourage group interaction. The following questions were employed specifically to explore parental awareness and perceptions of childhood overweight: 'What is it?', 'How can you tell if a child is overweight?' and 'Is childhood overweight a problem in England?'

All focus groups were audio recorded and transcripts checked by two independent researchers (ARJ and RMH).

Data Analysis

One twin from each pair was dropped at random to ensure statistical independence (n=14). For focus groups, the same procedure was used (n=2).

Child height and weight measurements were used to calculate BMI (weight (kg) / height (m)²). Child overweight and obesity status were identified using International Obesity Taskforce (IOTF) cut-offs (defined to pass through BMI of 25 and 30 kg/m² respectively at age 18).¹³ Child underweight status was identified as thinness grade 2 (defined to pass through BMI of 17 kg/m² at age 18).¹⁴

Parents' perceptions of their child's weight status and their level of concern for the national rise in childhood overweight were analysed using cross-tabulation according to their child's

actual weight status. Data were included for analysis when a parent had responded to both questions and a measure of BMI had been obtained for their child. The sensitivity of parents recognising if their child was overweight was assessed. The specificity and positive predictive value were also examined. In order to do this, responses to the parental perceptions question were combined as follows: 'very underweight' was combined with 'underweight' and 'normal'; 'overweight' was combined with 'very overweight'. Actual child weight status categories were also combined: 'underweight' with 'healthy weight' and 'overweight' with 'obese'. A chi-square test was undertaken to identify if parental concern for the national rise in childhood overweight was dependent on their child's actual weight status. To achieve enough responses in the weight status categories to perform the test the categories of child weight status were collapsed: 'underweight' was grouped with 'healthy weight' and 'overweight' was grouped with 'obese'. A cross tabulation was also performed using responses from parents of overweight and obese children to assess level of concern for national childhood overweight according to parental ability to identify their child's unhealthy weight status. Responses from parents of overweight and obese children were further assessed using a chi-square test to determine whether parental ability to identify their child's unhealthy weight status was dependent on the mother's highest educational qualification at birth. SPSS Statistics 17.0 (SPSS Inc, Chicago, IL, USA) was used.

All focus group data were analysed using the qualitative data analysis package NVivo 7 (QSR International Pty. Ltd, Doncaster, VA, Australia) which was used to assess data both thematically across questions and for emergent themes. The main focus discussion guide headings directed the analysis process that involved the systematic and continuous development of categorisation codes that organised the data and identified important themes and issues.¹² Quotes are used for illustrative purposes. All quotes presented are from mothers and tagged by group number (FG 1-6), focus group interviewee ID and their child's gender (Boy or Girl). The moderator is indicated as *.

RESULTS

Sample Characteristics

Data from 536 children and their parents were available for quantitative analyses. There were no differences in age or BMI at 6-8 years or sex between those children who were included in analyses and those who were not. A significant difference was found in mother's highest educational qualification category at birth ($P < 0.0001$) and mother's age at 6-8 years ($P = 0.01$) between those children included in analyses and those who were not. The majority of mothers, whether included in analyses or not, reported their highest educational qualification category at birth to be either 'NVQs or none' or 'GCSEs or equivalent'. However, a greater proportion of mothers included in analyses reported their highest educational qualification category at birth to be either 'A levels or equivalent' or 'Degree or equivalent'. Median maternal age at 6-8 years was 36.4 years for those included in analyses and was 32.2 years for those not included in analyses. Most parent questionnaires were completed by the child's mother ($n = 528$), the remainder were either completed by the child's father ($n = 6$), step mother ($n = 1$) or grandparent ($n = 1$). The characteristics of the children and their mothers are shown in Table 1. Of the 23.7% overweight and obese children, 17.0% were overweight and 6.7% were obese.

Of all those parents who participated in the 6-8 year phase of the GMS ($n = 617$),⁹ 259 (42.0%) registered their interest in the qualitative element of the study. A random selection were invited to participate in a focus group. Six focus groups were held and 27 parents (26 mothers, 1 father) participated. Their characteristics and their children's characteristics are also detailed in Table 1; 23.1% of their children were overweight and 3.8% were obese.

Quantitative Parental Perceptions of Child Weight Status

Analyses of parents' perception of their child's weight status according to objectively measured weight status are presented in Table 2. The sensitivity of parents recognising if their child was overweight was 0.31. Both the specificity and positive predictive value were 1.

For children at all levels of child weight status, most parents perceived their child as being of 'normal' weight (Table 2). Almost 10% of healthy weight children, according to IOTF criteria, were perceived to be less than a healthy weight by their parents and the prevalence of child underweight was overestimated by more than 8 fold; 7.8% of parents perceived their child as 'underweight' or 'very underweight' (Table 2) while only 0.9% were identified as underweight using international standards (Table 1). Conversely, the prevalence of child overweight was underestimated with 7.3% of children being perceived as either 'overweight' or 'very overweight' by their parents (Table 2) and 23.7% being identified as overweight or obese according to international standards (Table 1).

Examination of responses from parents of overweight and obese children found that more than two-thirds (69.3%, Table 2) underestimated their child's weight, classifying them as 'normal' weight. Only 30.7% (n=39) of overweight and obese children were perceived as 'overweight' or 'very overweight' by their parents, the majority of which (n=38) were described as 'overweight'. Of the 38 children identified by their parents as being 'overweight', 26 (68.4%) were obese according to IOTF criteria.

Analyses of parental concern for the national rise in number of overweight children according to child weight status showed that almost three quarters (73.5%) of all parents expressed concern and only 7.3% were unconcerned (Table 2). A high level of concern was found amongst parents of both boys and girls and for all levels of child body weight with the greatest proportion of parents expressing concern being those of overweight and obese children (80.3%). A Chi-square test, however, found no association between parental concern for national childhood overweight and child weight status ($P=0.098$). Further analysis of those responses from the 127 parents of overweight and obese children also showed a high level of concern for national childhood overweight irrespective of parental ability to correctly identify their child's weight status. 92.3% (12/13) of parents who correctly and 78.9% (90/114) of parents who incorrectly identified their child's overweight or obese status stated they were concerned about the national rise in the number of overweight children. The Chi-square analysis also performed on those responses from parents of overweight and obese children found no association between parental ability to correctly identify their child's weight status and mother's highest educational qualification at birth (n=114; $P=0.737$).

Qualitative Parental Perceptions of Child Weight Status

What is childhood overweight?—It was difficult for some parents to define childhood overweight. In several focus groups it was described as when a child's weight exceeded an acceptable level or clinical parameter yet understanding of such measures often were unclear.

Is it looking at the parameters, the sort of set parameters of what a GP or the medical profession would say is...a standard weight for a child and then any child over and above a certain weight? And I don't know if it's against height or it's just against age. I don't know. [FG3, ID3, Girl]

Childhood overweight was also described as something that was visible and 'larger than the average'.

Just children who are larger than the average...you can blatantly tell, can't you, the ones that are overweight. [FG2, ID3, Girl]

To a lesser extent, childhood overweight was understood to be an issue that impacted upon physical activity and the manifestation of poor health related behaviours.

You know you can look at a child and see it's eating wrong or...he or she is not getting exercise...there's other problems. [FG4, ID3, Boy]

Is childhood overweight a problem?—When asked if they thought childhood overweight was a problem nationally, participants in most focus groups either stated that it was or was becoming more of an issue.

I think it's becoming more a problem. I think obviously it, it wasn't a problem for a long time but I think you can see more and more now... [FG2, ID2, Boy]

Some participants also demonstrated an awareness of government concerns for the prevalence of childhood overweight and of school-based health promotion initiatives. For some parents though there was a level of scepticism towards the scale of the problem. Parents questioned the media's interpretation of the issue and suggested that the reported prevalence of childhood overweight may be disproportional to reality.

I sometimes wonder if it's a bit over hyped...there's all these reports in the press...and...I don't know any statistics but just reading in the press it just sounds as if there's sort of like a big, you know sort of like millions, like about half of the children are obese. And I think well I don't know where these children are cos [because] you see them but not like a huge percentage. [FG4, ID4, Boy]

During several focus groups participants discussed how they felt the incidence of childhood overweight differed with location. Parents commented that the prevalence of overweight children varied both from region to region and within a region and there was an awareness of differences in socio-demographic backgrounds.

I think it varies from region to region as well...and even within the northeast...it varies. It depends on whereabouts you, where you live. [FG2, ID2, Boy]

I think that varies depending on your socio-economic class. [FG3, ID3, Girl]

During one focus group parents also demonstrated awareness that childhood overweight is not only an issue for poorer families.

...but then again then you're classing obese children as being from the poorer backgrounds. [FG4, ID3, Boy]

and they're not always. [FG4, ID4, Boy]

and they're not, so. [FG4, ID3, Boy]

Definitely not. [FG4, ID2, Boy]

Age was also discussed in relation to the prevalence of childhood overweight. Parents stated that the frequency of overweight children increases with age and that this was a more noticeable issue for children attending secondary school (age 11-16 years) than primary school (age 4-11 years).

...I think it's more after [age] 11 [that] I notice more overweight than what I would at that [primary school] age group. [FG2, ID1, Boy]

I wouldn't say I've noticed a great increase in...the junior school they go to, but I've got a senior school...and I'm amazed at the amount of big...sorry...fat...boys and girls...I'll see them into the junior school and then I see them at the senior school and within a year or two, well...there's a lot more fatter ones, bigger ones, chubbier, whatever you want to call it... [FG3, ID1, Boy]

To a lesser extent, parents identified differences in prevalence of childhood overweight between boys and girls. However, there was also some confusion about the role of other factors such as the onset of puberty.

There seems to be more heavier girls...It's like chicken and egg...you don't know whether...girls are getting pubescent because of their weight or are they getting pubescent...for other factors and therefore they're storing more weight? [FG3, ID2, Girl]

How can overweight children be identified?—Following direct questioning and during discussions of the prevalence of childhood overweight nationally, parents demonstrated their commonsense approaches to identifying overweight children. The most frequently employed means of identifying an overweight child were that of visual assessment or appearance and by comparing children within a class, school or area. These approaches emerged in all the focus groups.

*So is there a way that you could tell if they were overweight or not?

By their size. [FG2, ID1, Boy]

Their size, yeah. [FG2, ID3, Girl]

Their stature, basically. [FG2, ID2, Boy]

Having a pot belly. A big round chubby face. [FG2, ID2, Boy]

Yeah, a bit of an unhealthy look sometimes. Red in the face. [FG2, ID1, Boy]

...there are a couple of children in [child's name] class who are large I would say there are a couple of boys who are really quite big I think for their age but I think they're the exception I don't see generally, if I look at the school in assembly or something, you know, you don't see lots and lots of big children. [FG4, ID2, Boy]

A child was also judged to be overweight when their weight had a detrimental effect on their physical fitness or mobility.

...I can think of children who I know...you can tell it by their, they struggle with activity. That's a good judge. [FG5, ID1, Girl]

To a lesser extent parents used the size or fitting of clothes to identify overweight status.

From personal experience, it's when you go to the shops and you're buying clothes and you're thinking, well he's only 8 and I'm having to buy size, age 13. [FG1, ID2, Boy]

The use of more 'official' approaches in detecting excess weight in children was debated by some participants and one mother stated that a combination of methods was needed in order to identify an overweight child.

...I would say a [an] overweight child is visibly overweight by the amount of fat that they have on their body that's may be holding them back when they try to, to do some exercise. I don't think I'd ever take any notice of what the scales say. [FG3, ID2, Girl]

It must be, I mean there's more than one factor, obviously it's partly visual, it'll partly be down to what they actually weigh on the scales and partly whether you consider someone's overweight I suppose depends on whether it impacts as well on their day to day life, whether it stops them from being active. [FG6, ID3, Boy]

Grounds for not engaging with the issue—As discussions continued a greater understanding of the methods used by parents to identify overweight children was obtained and common themes emerged highlighting the grounds on which parents fail to recognise and engage with the issue.

A common reason, discussed in most focus groups, expanded upon the scepticism towards media messages regarding overweight in children. Parents were aware of childhood overweight as being an issue discussed by the media; however, the persuasive nature of the media, its potential to portray extreme cases and non-consumer friendly information led to a lack of parental confidence in reporting.

It's quite a bit of it in the news and in the papers...[FG2, ID3, Girl]

But do you not think that makes it more...that you think there's more because they've put in the papers...[FG2, ID1, Boy]

...quite a lot of the journalists will be arts based rather than science based...if they are science based, they might not be able to get the facts and figures across in the way that a normal person who doesn't have a statistical understanding would be able to gather it... [FG5, ID3, Girl]

Since overweight in children was described largely as a visual issue that was difficult to identify, except for extreme cases, the lack of trust in the 'statistics' and belief in the scale of the problem was expanded upon. Interestingly, the term 'statistics' was used interchangeably referring to both facts regarding the population and also the objective measures used in deriving such data. The apparent presence of conflicting messages provided to parents regarding appropriate weight gain in infancy and childhood led to further questioning of the reliability of clinical reference data used by health professionals.

But we're safe with obese, aren't we? We're not safe with overweight...You can look at a child and think oh yes they're, that's obese and like 'tut-tut' the parents, it's all the parents' fault isn't it cos [because]...that's the way people are but if then they're overweight, it's not, it's not safe at all... because, are they overweight? [FG5, ID2, Girl]

They can make statistics do whatever they want to. [FG5, ID3, Girl]

Oh yes, they can prove anything with statistics. [FG5, ID4, Boy]

They can make a study of, you know, a thousand people suddenly be...applied to everyone...So, I think that the, I think the statistics are difficult to understand for the general public...and we can't even decide on what an overweight child would look like so...[FG5, ID3, Girl]

But BMI isn't very...I've got a personal gripe against BMI. [FG3, ID2, Girl]

Yes...some of your fittest athletes have a big BMI, don't they? James Cracknell's BMI is absolutely sky high, but let's face it, we would like to be half as fit as he is. [FG3, ID3, Girl]

...there's a lot of celebrating –oh you popped out a good big baby, isn't there? [FG3, ID3, Girl]

Yeah, well done, how much has your baby put on this week? And oh your baby hasn't gained, or they're not on the right line in the book...the centile line. There's a lot of emphasis on having a nice big fat rounded baby but then they don't want you to have a rounded fat child. [FG3, ID2, Girl]

Scepticism towards the identification of a child as being overweight was further justified during several focus groups because of the natural variety in body shape amongst children and the continuous changes that take place in growth and development during the maturation process.

I think that's difficult to be definite about because kids go through phases where... [FG5, ID1, Girl]

They go up then out, don't they? [FG5, ID4, Boy]

...puppy fat comes to mind. I think you've gotta be very careful not to make them focus on that and think that they are overweight when quite often they have a growth spurt and they're skinny again. [FG5, ID1, Girl]

Because I think as they seem to get older, they seem to sort of...thin up, if you know what I mean, as they're growin', sort of thing. [FG1, ID1, Girl]

Again, the importance of clothing size for some parents was illustrated by one mother who questioned the significance of clinical measures since her child was able to wear 'standard sized' clothes.

...I certainly wouldn't class my son as being overweight...but I certainly wouldn't have classed him as being obese but maybe his BMI would be higher than it should...But, he's still in standard trousers so he can't be that bad! [FG5, ID4, Boy]

For some there was concern that emphasising overweight status in children could have a negative impact and result in the development of eating disorders and underweight.

I'm not gonna [going to] make my child anorexic and worried about her weight when there's no issue. [FG5, ID3, Girl]

Some parents added that their greater concern was health status and the diet and exercise capabilities of children rather than clinical weight status.

...I would be more concerned about children with bad diets. I appreciate that it leads into the overweight issue but I think again, it's hard to, to judge when children are overweight...But, I think it stems from the bad diet. That's my concern as a mother, when I see around what children are actually eating...[FG5, ID2, Girl]

I would say we should be more concerned with what's unhealthy rather than what's overweight...my son may be heavier but he's certainly...he always used to win his races and he's certainly fit and healthy, still plays football...things like that. And I would say that to look at their physical fitness... rather than just...how much they weigh...is much more important. [FG5, ID4, Boy]

DISCUSSION

In this large cohort study parents' ability to correctly identify when their child was overweight according to internationally recognised standards was limited. Recent reviews have reported similar findings.⁵⁻⁷ Most parents of overweight and obese children in our study perceived their child to be of 'normal' weight with less than one third recognising that their child was overweight. Moreover, most children identified as 'overweight' by their parents were, in fact, obese. A study by Johnson *et al.*¹⁵ has observed a shift in the threshold for 'overweight' amongst British adults and our findings support previous suggestions^{11, 16, 17} that the same phenomenon is occurring in parents' perceptions of overweight in children. The qualitative findings in this study adds to the existing evidence by providing useful insights into parents' views of overweight in children and the reasons for such disparity between parental perceptions of child weight status and objective measures.

During discussions parents demonstrated a limited understanding of how childhood overweight is actually defined and their comprehension of the measures which guide the clinical and scientific community was vague. Parents therefore used a range of alternative approaches to objective measures when determining overweight in children which relied on extreme and exceptional cases as a reference point. Understanding how parents actually identify childhood overweight and their beliefs of what constitutes an 'overweight' child is important. This study indicates that the alternative approaches and 'definitions' used by parents¹⁸ underpin both their negation of overweight in children and their reasoning for being detached from the problem.

A common approach used by parents in this study to identify childhood overweight was to compare children with others. The tendency of parents however to associate 'overweight' with the extreme cases which are so often illustrated in the media led to a lack of trust in the information accompanying such depictions. Interestingly, parents not only questioned the 'statistics' regarding the scale of the problem but also the methods by which such data are

derived (i.e. BMI). Parents suggested that such measures fail to take into account the range of and changes in body shape seen amongst children and talked about the 'phases' children go through and how they 'thin up' with age. Previous research with parents has also found that they did not favour 'official' methods of identifying overweight and believed they were irrelevant for their child,^{19, 20} and that parents describe their child's overweight as something they 'grow out of'.^{19, 21}

Consistent with previous studies, parents discussed other approaches used when determining weight status such as considering a child's ability to be physically active and their clothing size.^{20, 22} The reliability of clinical measures was therefore also challenged in this study if a parent was able to purchase clothing for their child within conventional ranges. Importantly, however, changes are being made to children's clothes sizes in response to the obesity epidemic²³ and parents may be unaware of the false reassurance these changes offer.

Further parental uncertainty towards the pertinence of childhood overweight arose from the apparent contradictory advice given to parents regarding appropriate weight gain during early childhood. It was described how weight gain during early life and having a 'big baby' was encouraged but the opposite was true for having a 'big child'. Some parents also took a broader perspective and raised concerns similar to those described previously²⁴ that such attention given to the 'obesity epidemic' and acting upon it may bring about disordered eating and issues of underweight in children. Parents also discussed physical health; for some parents a child's apparent health status and health related behaviours were of more concern than their objectively measured weight category. The Healthy Weight, Healthy Lives Consumer Insight Summary has also found that many parents assumed their children were 'healthy' provided that they seemed happy and demonstrated no obvious health problems.²⁴

Our findings provide some promise for those involved in tackling the rising rates of childhood overweight and obesity. The majority of parents in this study were concerned about the increasing number of children being identified as overweight nationally, and most focus group participants described feeling that unhealthy weight gain in children was or was becoming a national concern. However, they did not consider it a problem that was personally relevant. This draws attention to an important issue for future interventions and health promotion strategies. Since evidence suggests that parents who perceive their child's weight status as being a health problem are more likely to make changes to their lifestyle,⁴ a considerable proportion would be unlikely to see the need to take action with their own child. Further work is therefore required to explore and identify appropriate methods of improving parental recognition of childhood overweight and their engagement with healthy weight maintenance strategies for children. Since this study found that, for some parents, childhood overweight was perceived as more prevalent in particular groups of society that is those other than themselves it is important that any work on prevention strategies takes this into consideration.

Strengths of the present study are that parental perceptions of child weight status were examined in a large population-based cohort of children, and that a combination of quantitative and qualitative techniques were used. A limitation of the study, however, relates to the sensitivity of the method used to examine parents' perceptions of their own child's weight status. Since we know that parents use extreme cases as a reference point when determining childhood overweight asking them to assess whether they think their child has a 'healthy' or 'unhealthy' weight may be more informative than asking them about 'normal' weight or 'overweight'. In addition, the sample for this study is predominantly Caucasian⁸ and the ability to generalise our findings to other cultures and ethnic groups is limited. It also explored mainly maternal perceptions and attitudes to childhood overweight. Previous

research has shown that amongst some cultures a large body shape is not necessarily perceived negatively but is in fact desired and a sign of both health and wealth,²⁴ and that mothers are more likely to accurately assess their child's weight than fathers.⁷ In-depth research is therefore required with families from various cultures and with other potentially influential figures such as fathers and other caregivers to assess their level of understanding and engagement as well as their support needs.

In summary, the ability of parents in the present study to recognise childhood overweight and obesity according to an internationally recognised standard was limited. Parents did not understand, use or trust clinical measures and relied on extreme cases to identify the problem. The alternative approaches used by parents to identify overweight in children underpinned their reasoning for being detached from the issue and although most parents demonstrated concern for unhealthy weight gain in children nationally, it was not regarded as personally relevant. The identification of overweight and obesity in children and guidance relating to health related behaviour change could be made by health professionals. However, unless parents believe or acknowledge 'the problem' they are unlikely to engage with or follow any 'guidance' provided. This study therefore highlights the urgent need to identify successful methods of improving parental recognition of and engagement on a personal level with the issue of childhood overweight; such recognition is an important pre-requisite to behaviour change. Given the reliance of parents on visual assessments it may be that the use of visual images of overweight and obesity would be beneficial. Since parents also fail to correctly estimate their children's physical activity levels²⁵ it would also be useful to consider a multifaceted approach which addresses both parental perceptions of their child's weight status and their views on health related behaviours.

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Table 1

Sample characteristics of mothers and children, focus group participants and their children.

	n	%	Median	Interquartile range
Overall				
Mothers:				
Age (decimal years)	536		36.4	32.25 40.08
Highest educational qualification at birth ¹	502			
Degree or equivalent	109	20.3		
A Levels or equivalent	46	8.6		
GCSEs or equivalent	267	49.8		
NVQs or none	80	14.9		
Missing	34	6.3		
Children:				
Age (decimal years)	536		7.4	7.17 7.75
Sex	536			
Boys	271	50.6		
Girls	265	49.4		
BMI (kg/m²)	536		16.2	15.23 17.81
Weight status ²	536			
Underweight	5	0.9		
Healthy weight	404	75.4		
Overweight and Obese	127	23.7		
Focus Groups	6			
Mothers: ³				
Age (decimal years)	26		38.0	34.94 41.25
Highest educational qualification at birth	25			
Degree or equivalent	11	42.3		
A Levels or equivalent	2	7.7		
GCSEs or equivalent	10	38.5		

	n	%	Median	Interquartile range
NVQs or none	2	7.7		
Missing	1	3.8		
Participant's children:				
Age (decimal years)	26		7.4	6.96 7.69
Sex	26			
Boys	17	65.4		
Girls	9	34.6		
BMI (kg/m²)	26		16.1	15.03 18.21
Weight status^{1,2}	26			
Underweight	1	3.8		
Healthy weight	18	69.2		
Overweight and Obese	7	26.9		

All data presented represent sample after one twin from each set was removed

¹Percentage column does not add up to 100 due to rounding

²Overweight and obesity were determined using international cut-off points, defined to pass through BMI of 25 and 30 kg/m² respectively at age 18¹³; Underweight was determined using international cut-off points, defined to pass through BMI of 17 kg/m² at age 18¹⁴

³One father participated in the focus groups

Abbreviation: BMI, body mass index; GCSE, General Certificate of Secondary Education; NVQ, National Vocational Qualification.

Table 2

Parental perceptions of their child's weight status and their concern for the national rise in number of overweight children according to their child's objectively measured weight status.

Child weight status (n = 536)¹				
Parents' perception of their child's weight status	Underweight n (%)	Healthy weight n (%)	Overweight and Obese n (%)	Total n (%)
<i>Very underweight or Underweight</i>				
Overall	2 (40.0)	40 (9.9)	0 (0.0)	42 (7.8)
Boys	1 (50.0)	27 (12.9)	0 (0.0)	28 (10.3)
Girls	1 (33.3)	13 (6.7)	0 (0.0)	14 (5.3)
<i>Normal</i>				
Overall	3 (60.0)	364 (90.1)	88 (69.3)	455 (84.9)
Boys	1 (50.0)	183 (87.1)	38 (64.4)	222 (81.9)
Girls	2 (66.7)	181 (93.3)	50 (73.5)	233 (87.9)
<i>Overweight or Very overweight</i>				
Overall	0 (0.0)	0 (0.0)	39 (30.7)	39 (7.3)
Boys	0 (0.0)	0 (0.0)	21 (35.6)	21 (7.7)
Girls	0 (0.0)	0 (0.0)	18 (26.5)	18 (6.8)
Total n (%)				
Overall	5 (100.0)	404 (100.0)	127 (100.0)	536 (100.0)
Boys	2 (100.0)	210 (100.0)	59 (100.0)	271 (100.0)
Girls	3 (100.0)	194 (100.0)	68 (100.0)	265 (100.0)
Concern for the national rise in number of overweight children				
<i>Yes</i>				
Overall	4 (80.0)	288 (71.3)	102 (80.3)	394 (73.5)
Boys	2 (100.0)	150 (71.4)	53 (89.8)	205 (75.6)
Girls	2 (66.7)	138 (71.1)	49 (72.1)	189 (71.3)
<i>No</i>				
Overall	0 (0.0)	34 (8.4)	5 (3.9)	39 (7.3)
Boys	0 (0.0)	21 (10.0)	2 (3.4)	23 (8.5)
Girls	0 (0.0)	13 (6.7)	3 (4.4)	16 (6.0)
<i>Not sure</i>				
Overall	1 (20.0)	82 (20.3)	20 (15.7)	103 (19.2)
Boys	0 (0.0)	39 (18.6)	4 (6.8)	43 (15.9)
Girls	1 (33.3)	43 (22.2)	16 (23.5)	60 (22.6)
Total n (%)				
Overall	5 (100.0)	404 (100.0)	127 (100.0)	536 (100.0)
Boys	2 (100.0)	210 (100.0)	59 (100.0)	271 (100.0)
Girls	3 (100.0)	194 (100.0)	68 (100.0)	265 (100.0)

¹Overweight and obesity were determined using international cut-off points, defined to pass through BMI of 25 and 30 kg/m² respectively at age 18¹³; Underweight was determined using international cut-off points, defined to pass through BMI of 17 kg/m² at age 18¹⁴