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Children's understandings' of obesity, a thematic analysis

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Abstract
Childhood obesity is a major concern in today's society. Research suggests the inclusion of the views and understandings of a target group facilitates strategies that have better efficacy. The objective of this study was to explore the concepts and themes that make up children's understandings of the causes and consequences of obesity. Participants were selected from Reception (4–5 years old) and Year 6 (10–11 years old), and attended a school in an area of Sunderland, in North East England. Participants were separated according to age and gender, resulting in four focus groups, run across two sessions. A thematic analysis (Braun & Clarke, 2006) identified overarching themes evident across all groups, suggesting the key concepts that contribute to children's understandings of obesity are "Knowledge through Education," "Role Models," "Fat is Bad," and "Mixed Messages." The implications of these findings and considerations of the methodology are discussed in full.

Key words: *Obesity/overweight, health behaviour, children research, qualitative research*

The Health Survey for England 2009 illustrated that 65.9% of men and 56.9% of women have a body mass index (BMI) higher than 25 kg/m^2, classing them as overweight, obese (>30 kg/m^2), or morbidly obese (>40 kg/m^2). Obesity is linked to many chronic illnesses, including type II diabetes, heart disease, and some cancers—specifically bowel and others within the digestive system (Renehan, Tyson, Egger, Heller, & Zwahlen, 2008). As a result, the direct cost to the National Health Service (NHS) of treating obesity was estimated to be between £991 and £1,124 million, for the 2001/2002 financial year (McCormick & Stone, 2007).

Childhood obesity is of particular concern because obese children are far more likely than children of a normal weight to become obese adults (Alexander & Sherman, 1991). The Health Survey for England 2009 showed that between 1995 and 2008, the percentage of overweight and obese girls rose from 25.5 to 29.2% and from 24.5 to 31.4% for boys. This is despite the fact that during the same period reported total energy intake in the United Kingdom (UK) fell by around 20% (Statistics on Obesity, Physical Activity and Diet England, 2006). These contradictory figures highlight the complexity

of factors contributing to obesity, pointing to issues such as levels of physical activity, which have significantly fallen over the past two decades (Prentice & Jebb, 1995).

Many other factors influence incidences of obesity. The negative impact of childhood obesity causes the greatest concern and needs to be further understood. Obese children are more likely to become obese adults and experience increased health problems. Knowler, Pettitt, and Saad (1991), highlighted the links between childhood obesity and a poor immune system, risk of raised blood pressure, and cardiovascular problems. Studies have also identified that overweight and obese children are more likely to suffer psychological problems associated with low self-esteem, bullying, and social exclusion (Breat, Mervielde, & Vandereycken, 1997).

On an international scale, obesity can be seen as a problem of the developed world, a result of economic wealth, high food availability, and low levels of manual labour leading to lower levels of physical activity. This is in conjunction with high levels of car ownership and wide ranging public transport systems adding to the problem. In short, at the heart of obesity lies a homeostatic biological system that

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works constantly to maintain energy balance to keep the body at a constant weight. This system has not yet adapted to the world in which we currently live because the pace of technological progress has surpassed evolution resulting in a more sedentary lifestyle (Department of Innovation Universities and Skills, 2007). One surprising feature of the geographical distribution of obesity is its increased prevalence in economically and socially deprived areas in the western world, including the focus of this current piece of research, the United Kingdom. This phenomenon is very much a recent development, because historically deprived areas tended to see higher levels of under-nutrition. Brunt, Lester, Davies, and Williams (2008) illustrate how this situation has now reversed. They found between 1995 and 2005 the gap between obesity levels in the most deprived areas compared to the least (the latter typically having the higher levels) was steadily closing, and that by 2005 obesity levels in the most deprived areas had overtaken those in the least deprived areas, a phenomena that persists today.

The Childhood Measurement Programme (Department of Health and Department for Children, Schools and Families, 2008) demonstrated Sunderland in the north-east of England has some of the highest levels of overweight and obese children in the United Kingdom. This same publication also points out the strong positive correlation between areas considered as deprived and levels of obesity in children in Reception (4–5 year olds) and Year 6 (10–11 year olds). Areas of Sunderland are considered to be economically and socially deprived meaning the children who live there can be considered high risk. The statistics relating to Sunderland, where this study took place, demonstrate that 27.8% of Reception-aged children are either overweight or obese and for Year 6 pupils this rises to 38.4%.

The Foresight Report (Department of Innovation Universities and Skills, 2007), tackling obesity, points out that current policies are failing because they do not provide the depth and range of interventions needed. This might lead to positive interventions being ineffective if they are undermined by other areas in society such as social factors and the power of media advertising. The government launched its Healthy Schools Initiative in 2005; however, there has been no substantial reduction in obesity levels since 2005 (Department of Health and Department for Children, Schools and Families, 2008). With this in mind it would seem timely to approach the problem from a different perspective. Effective policies to tackle obesity need to consider all parties involved. However, current policies have been formed using a top down approach i.e., from government, health and education professionals, and

even celebrity chefs! Even though these groups are likely to have a broad understanding of the problem from its roots to the long-term consequences, there has been a notable failure to take into consideration the understandings of the individuals at highest risk of obesity, the children themselves. There is growing evidence that interventions incorporating the views of the target population have a greater level of success (Hesketh, Water, Green, Salmon, & Williams, 2005). In the United Kingdom there has been a strong movement to ensure the inclusion of children in decision making, particularly in relation to issues that directly affect them such as education, social care, and health (Department of Health, 2002; Department of Health and Department for Education and Skills, 2004). The collection and dissemination of the understandings of children relating to obesity could provide an insight into why so many strategies are failing. This in turn could lead to the development of policies that can be delivered to provide more successful outcomes.

There is a clear shortage of research examining children's understandings' of obesity, the studies that have attempted to explore this domain have focused on exploring parent and care giver perceptions (Young-Hyman, Herman, Scott, & Schlundt, 1999), and the understandings of health professionals (Chamberlin, Sherman, Jain, Powers, & Whitaker, 2002). More recently studies have considered the understandings of care givers, health professionals, and teachers alongside those of the children themselves (Borra, Kelly, Shirreffs, Neville, & Geiger, 2003; Hesketh et al., 2005). Studies that have examined children's understanding have been focused on body image, overweight versus underweight (Hill & Silver, 1995), and peer perceptions of overweight and eating behaviour (Bell & Morgan, 2000; Oliver & Thelen, 1996), but not on the understandings' of the children themselves with regards to the causes and consequences of obesity.

Focus groups have proved to be a particularly useful method for collecting data from children, they are most effective with groups of three children and in situations where the children know and like each other. Groups must be carefully selected to ensure the children are comfortable with each other. Talking together in small groups is familiar territory for children because it simulates class work. This method allows the researcher to structure the discussion around themes or topics rather than direct questions. This in turn enables the children to take control of the discussion (Mauthner, 1997) with the researcher present to keep things on track. Conducting group discussions in single sex groups can also prove to be more successful because boys are often louder and more willing to talk and this can mean they

direct the topic of conversation. It has also been noted the use of some sort of structured activity such as drawing, reading, or sorting cards, can help focus discussion in particular with young children. When discussing diet with children, nutritionists and dieticians regularly use replica food items to help visualise the topic under discussion and photos depicting scenes of physical activity have proved effective in qualitative studies (Hesketh et al., 2005).

In summary the objective of this research is to investigate the understandings of a high risk group of children (high risk because of their socio-economic status so determined by their locality), of some of the causes and consequences of obesity, and its links to diet and physical activity. The concepts and themes generated by this research should be used to provide an insight that may inform local policies and interventions that need to be developed to provide a broader and deeper range of options to address this multi-faceted issue.

Method

Approach

In order to address the gaps in current literature it was decided this research should focus on identifying themes within the participants understanding. This would provide the researcher with scope for further investigation of the subject in question. It was therefore decided that the most appropriate method of analysis would be a thematic analysis. However, there have been criticisms of this approach in the past due to the lack of clear guidelines for researchers employing such methods. This has subsequently contributed to some researchers omitting "how" they actually analysed their results (Attride-Stirling, 2001). It was of upmost importance to the authors in this current study to employ a clear, replicable, and transparent methodology.

Braun and Clarke (2006) outline a series of phases through which researchers must pass in order to produce a thematic analysis. This procedure allows a clear demarcation of thematic analysis, providing researchers with a well-defined explanation of what it is and how it is carried out whilst maintaining the "flexibility" tied to its epistemological position. The authors in this paper take a position that acknowledges our desire to incorporate the individual experiences of the participants and the meanings they attach to them. However, we also wish to consider the impact of the wider social context on these meanings. Braun and Clarke describe such a position as "contextualist," sitting firmly between essentialism or realism and constuctionism. Not all theorists describe these two poles of epistemological

outlook in the same way; Madill et al. (2000) refers to them as "naive realist" and "radical relativist." Methodologies that go hand in hand with this midground position are typically phenomenological in nature, but the flexibility of thematic analysis means that it can also be underpinned by an "in-between" epistemological position. Willig (2008, p. 13) summarises this by explaining a position that argues "while experience is always the product of interpretation and, therefore, constructed (and flexible) … it is nevertheless 'real' to the person who is having the experience." We wish to consider the reality of obesity to the participants, through an exploration of their experiences and the meanings they attach to them, whilst incorporating the broader role society plays in contributing to and shaping the participants meaning making and subsequent understandings.

Participants

Twelve participants were selected through liaising with the school and class teachers, this was particularly important considering the sensitive nature of the research topic and the fact that the participants taking part in this study were children—a vulnerable group. Measures were taken to prevent any of the participants feeling stigmatised. Therefore, under the guidance of the class teachers, the participants approached to take part in the study were carefully selected to ensure no children who may have been made to feel uncomfortable by the discussion were included, and to make sure that the children selected to be in the same focus groups were comfortable with each other. Six (three boys and three girls) were selected from two school years; Reception, aged between 4 and 5 years and Year 6 aged between 10 and 11. The motivation for selecting these age groups was that government statistics relating to childhood obesity are published for these two age brackets. These age groups are viewed as critical points in measuring children's BMI and in monitoring their changing health status. Through looking at these age groups, it may help us to gain an insight into what understandings children arrive at school with (primarily shaped by their experiences set within a home environment) and those that they have later on in their school life when further social influence (school and peers) may play a role in shaping their understandings. Efforts were made to make the sample representative of ethnicities attending the school so a proportionate number of children of Bangladeshi and Afro-Caribbean heritage took part. Participants were not recruited on account of their BMI or weight status. The parents of the children were provided with a study information

letter and, in addition, received a phone call from the school's community liaison officer to ensure that parents fully understood the nature of the study because the researcher was aware that for some parents English was not their first language. The phone calls were made in their mother tongue thus allowing the parents to sign the parental assent form with all their queries being answered. Participants were also asked for their verbal assent on the day prior to the study taking place.

Procedure

The study had received ethical approval from Northumbria University's School of Psychology and Sports Science Ethics Board prior to commencing. The researcher had also been approved by means of an enhanced criminal records background check clearing her to work with children; this approval was required by both the school and the university.

The focus groups all took place in the same quiet room at the school and were conducted by the principal investigator (referred to herein as the researcher). On arrival, the researcher introduced herself and provided name badges for the participants. The researcher briefly explained to the participants that she was there to talk to them about food and exercise. The researcher also explained to the participants that she wanted them to assume that she knew nothing, they were not being tested, and she was only interested in hearing what they had to say—not whether they were right or wrong. Verbal instructions were provided to the participants and they provided verbal assent prior to the recording commencing. A series of questions were developed by the research team, these were designed to keep the focus group sessions on track whilst exploring issues relevant to the research question. The sessions started initially with a discussion centred on the replica food items laid out on the table. Participants were asked to use the replica food and pick out healthy foods and make what they thought would be a healthy lunch. They were asked to explain why it was healthy and what made it healthy. Participants were then asked about foods they liked and why they liked them. In addition, they were asked about the sorts of things they normally ate at home and in school and things they liked to eat. Once conversation had dwindled concerning the replica food the researcher introduced the laminated picture cards, and the discussion moved to physical activity with the researcher encouraging the participants to explore the relationship between diet and exercise. Questions focussed on what activities they thought were healthy (as the images depicted activities that were both physical and sedentary; that is, one image

of somebody running another of somebody playing computer games). The participants were asked about what sorts of activities they liked doing and what made those activities good for them. They were asked what activities they regularly engaged with, the sorts of sports their parents and siblings took part in, and the activities they did as families. The themes of discussion were encouraged around the two elements pertinent to any strategy looking to reduce obesity: healthy eating and physical activity. Furthermore, questions also probed at what the participants thought the benefits were of following a healthy lifestyle and what the consequences were of not following one. They were also asked what advice they would give somebody who wanted to be healthier and how important it was to them to be healthy. The focus group guide was intended to provide a structure but not rigidly dictate the line of questioning. The researcher included prompts and encouraged participants to expand on their initial responses and followed up on notions that the participants raised themselves. The sessions on the first day lasted between 20 and 30 min, ending when the participants input was insufficient to continue. At the end of each session the researcher read out the participant debrief and provided each participant with a parental debrief information sheet to take home.

In order to strengthen the analysis process and gather the most appropriate data, the researchers reviewed the recording made on the first day and reflected on the procedures employed in the focus groups. Similar approaches of reviewing data to informing further data collection are used in methods such as grounded theory and it was felt that doing so would strengthen the current study. The decision was made not to use the props (replica food and cards) used on the first day in the second round of focus groups, as at times they had proved to be a distraction to the participants. As an alternative, Reception children were given colouring pens and paper to focus their attention. Year 6 focus groups were run again allowing for free discussion, following on from issues and understandings they had raised in the initial session. The second round of focus groups, other than the changes already detailed above, followed the same sequence as they had on day one and lasted around 30 min. The recordings were transcribed combining the recordings from both days creating four transcripts, one for each group.

Data analysis

The data collected from all the focus groups was transcribed by the principal investigator, during this

process the initial thoughts and ideas were noted down as this is considered an essential stage in analysis (Riessman, 1993). The transcribed data was then read and re-read several times and, in addition, the recordings were listened to several times to ensure the accuracy of the transcription. This process of "repeated reading" (Braun & Clarke, 2006) and the use of the recordings to listen to the data, results in data immersion and refers to the researcher's closeness with the data. Following on from this initial stage and building on the notes and ideas generated through transcription and data immersion is the coding phase. These codes identified features of the data that the researcher considered pertinent to the research question. Furthermore, as is intrinsic to the method, the whole data set was given equal attention so that full consideration could be given to repeated patterns within the data. The third stage involved searching for themes; these explained larger sections of the data by combining different codes that may have been very similar or may have been considered the same aspect within the data. All initial codes relevant to the research question were incorporated into a theme. Braun and Clarke (2006) also suggest the development of thematic maps to aid the generation of themes. These helped the researchers to visualise and consider the links and relationships between themes. At this point any themes that did not have enough data to support them or were too diverse were discarded. This refinement of the themes took place on two levels, primarily with the coded data ensuring they formed a coherent pattern, secondly once a coherent pattern was formed the themes were considered in relation to the data set as a whole. This ensured the themes accurately reflected what was evident in the data set as a whole (Braun & Clarke, 2006). Further coding also took place at this stage to ensure no codes had been missed in the earlier stages. Once a clear idea of the various themes and how they fitted together emerged, analysis moved to phase five. This involves defining and naming the themes, each theme needs to be clearly defined and accompanied by a detailed analysis. Considerations were made not only of the story told within individual themes but how these related to the overall story that was evident within the data. In addition, it was highly important to develop short but punchy names that conveyed an immediate indication of the essence of the theme. The final stage or the report production involved choosing examples of transcript to illustrate elements of the themes. These extracts clearly identified issues within the theme and presented a lucid example of the point being made.

Results

The thematic analysis process that was applied to the transcripts elicited key concepts that were evident in the data. These themes are viewed as essential in determining the understandings of all the participants. These categories have been labelled as "Knowledge through Education," "Role Models," "Fat is Bad," and "Mixed Messages." There are of course aspects of the participants' understandings that overlap across these categories. This, however, should be viewed as a good interpretation of understandings and attitudes in general, which are never made up of isolated concepts but are all relative to each other.

Knowledge through education

This theme is defined by the ability of all the participants to understand the roles of diet and physical activity. This is, in part, likely to be defined by different levels of education that the two age groups represented have, but nothing conclusive can be drawn given the relatively small sample size. The impact of their education on their knowledge will be demonstrated through evidence from the transcript.

All participants in the reception age group expressed the ability to name and identify different food items from the replica food. When they were asked to prepare a healthy lunch from the food items, they were able to point out food that would typically be classified as healthy.

I: No none of it is real! So what have you put in your healthy lunches girls? You tell me what you have got.
*: Apple, I've got pasta, egg, cracker, grapes, bun and cheese.

Girls reception

However, despite displaying that they "know" what healthy means there is evidence of confusion, and it would seem the concept of something being "good" for them is interpreted to be things they like to eat. This suggests that they don't yet fully understand the concept of "healthy" food.

I: And why's rice healthy?
*: Because it's nice.
I: What healthy food do you eat?
*: Chips

Boys reception

Their definition of healthy is centred on food they believe will make them grow for which fruit is highlighted as being particularly important. However,

they also attribute this property to the food that makes up their personal diets. This understanding might result from being told to eat so they grow up to be big and strong. It is important to consider younger children's understandings are likely to be primarily shaped by their home environment, where the emphasis is often on how much children are eating as opposed to what they are eating.

> I: Why is a banana important?
> *: Because it makes you strong so you can grow you have to have fruit so you can grow.
> I: Can you tell me then girls, we have found all these things that are good, as an example can you tell me, sausage, why is sausage good?
> *: Because it makes you feel strong.
>
> Girls reception

This understanding of the reception-aged girls represented in this study of eating so they can grow up to be strong is also evident with the boys in the same age group. However, the reception boys also place great importance on the necessity of exercise to develop strength, this demonstrates another aspect in their knowledge.

> I: What about this one here, swimming, who likes swimming?
> *: Me
> *: Me
> *: Me
> I: And why is swimming good for you?
> *: Cos it makes you strong.
>
> Boys reception

It is fair to say Year 6 groups relished the opportunity to express their knowledge. They were able to identify and name different food groups and discuss different types of physical activity; what's more they understand the link between the two in relation to obesity. It seems other influences have impacted on the children's understandings' such as school and extracurricular groups.

> *: This is a banana.
> I: Ok why's a banana healthy?
> *: Because it's got seeds inside, because it's a fruit.
>
> Girls year 6

The ability to identify a particular fruit by one of its universal characteristics shows a deeper level of understanding and suggests that a higher degree of learning. In fact it is explicitly stated that this nutritional knowledge has been gained at school.

> I: So do you know the different groups of food like carbohydrates, I heard you say protein and dairy before?
> *: Done it in science.
>
> Girls year 6

Moreover, it isn't just a nutritional knowledge they have developed through education. They appear well versed in the concept of a balanced diet and also understand the importance of a balanced lifestyle in relation to physical activity. They are able to articulate the notion of a balanced, healthy lifestyle through a consideration of the consequences of over eating and not exercising.

> I: So what happens to you if all you do is you do watch TV and play the computer, eat the food that you told me was the bad food, what would happen to you?
> *: You would have a miserable life.
> *: Get fat, teeth will fall out.
>
> Girls year 6

In the case of the Year 6 boys who took part in this study, it is apparent that although a great deal of their knowledge has come through education at school, other avenues have helped them develop different aspects of their understandings. In this case it seems to be through taking part in activities, typically sport outside of school, or and more uniquely to this group through the influence of their fathers.

> *: I would say my dad likes fish so I eat fish loads.
> *: My dad likes chicken, so he gives me chicken cos after school I do sport, like boxing, he gives me a sandwich with loads of different toppings in cos meats a muscle maker and vegetables is like an energy maker, so if you eat those you will get fitter and healthier.
>
> Boys year 6

It is evident where the ability exists, or is encouraged, to apply knowledge they have in a context relevant to their own lives, the knowledge becomes embedded in their understandings; it is applicable to them and, therefore, moves from being written on the board in school to being important to their own existence. This is exhibited by those participants, in particular the boys who participated, who have an involvement in sport. Having a motivation to understand nutrition and exercise leads to a desire to apply it because they comprehend the potential benefits. This aspect within the initial theme of knowledge through education leads directly on to the next

theme of role models. The key difference between these two themes is the first relates to information that is directly and intentionally meant to inform the children about healthy lifestyles in an institutional setting, while the second theme is typified by understandings that are formed through interactions with other people.

Role models

The application of knowledge gained through education is often facilitated by role models such as family members who reiterate this information through example. Role models play an important role in the concepts described by all the groups, for example, the older boys reported that their fathers helped encourage healthy behaviours, above and beyond the nutritional knowledge in the previous theme.

⋆: Like sometimes on an afternoon my dad goes to the gym, then there is these tracks outside, and I practice every day on my 100 meter sprint and I can do it in 12 seconds, and when I started doing it I was 21 second, so I keep practicing.

Boys year 6

This demonstrates some of the participants' understandings have developed by examples set for them by significant individuals in their lives. This is evident in the younger children's understandings in a less explicit manner; the example below demonstrates good health behaviours can be established through everyday behaviour exhibited by role models.

I: What about this one, walking to school? ... Why is it good for you?
⋆: Because me and my mam walk to school and its good.

Girls reception

There is some evidence that examples set to the girls who took part in this study, at home and by other role models, can encourage behaviours or ideals that are not beneficial to the girls health. Girls appear to look up to older female family members who aspire to be skinny.

⋆: I like to be skinny, my nana does as well, and she wants to be skinny because she's fat now but I still love her.

Girls reception

They also appear to have developed unrealistic ideas about weight loss and the consequences in terms of treatment. Viewing hospital treatment as a solution

to obesity, demonstrates a lack of understanding about the role of lifestyle behaviours in the condition. This may also suggest that these participants don't appreciate the importance of lifestyle behaviours in the onset of obesity.

⋆: Guess what, I seen this film right the boy was fat right, his legs was right down to the bottom, he had a fat tummy, I was hiding cos I hated him, he was horrible, he will have to go to hospital, he was fat.

Girls reception
I: So what would you tell somebody if you pretend that I was really, really fat, what would you tell me to do.
⋆: Go to the doctors ... hospital, operation.

Girls reception

There was some evidence that the older girls in this study had a more balanced outlook on what sort of body shape was healthiest, because they were aware of the negative health consequences associated with being underweight. It is interesting, however, that they are aware that maintaining a healthy lifestyle may be a challenge and this may result in a barrier to adopting healthier practices.

I: What about the other end of the scale, you know if you've got overweight being fat on this side what about being underweight at this end?
⋆: It's bad cos you're all bony and you can't do anything cos you're not strong enough, you're weak.
⋆: So you need to be in the middle.
I: Is it easy to stay in the middle?
⋆: No, because sometimes you can't be bothered to eat well and exercise.

Girls year 6

Within the theme of role models, there was some evidence of a difference between the genders in terms of available role models. The participating boys often cited football heroes as people whom they looked up to and aspired to be like. This highlights the role of the celebrity in providing a role model for today's children; the evidence from the participants in this study may suggest that typically boys look to footballers and other sporting heroes. It can be argued that such individuals do not always provide a strong moral code; they are seen as following a healthy lifestyle in terms of diet and exercise. It would seem that the female participants in this study often looked up to celebrities who weren't so explicitly seen to be following healthy lifestyles, or

a sense of caution was attached to following healthier behaviours.

⋆: Yeah like Wayne Rooney.
I: And why is he fit?
⋆: Cos he's good at footballing.
I: Do you think that they have to eat special food?
⋆: Yes
I: And what special food do they have to eat?
⋆: Bananas and apples.

Boys reception

⋆: Actually you can put weight on running cos muscle weighs more than fat so you can put weight on—like Katie Price she put on 10 pounds cos she started running.

Girls year 6

Another interesting aspect of the notion of role models' is that the girls were more concerned with how they appeared in a physical sense; it was particularly striking that the Year 6 boys identified unhealthy behaviour in their female peers attributing this to a desire to be like models.

⋆: Yes, she wants to be a model so she starves herself, her mam gives her a big packed lunch and she puts most of it in the bin, she's like that skinny then she walks out of the dinner hall.

Boys year 6

There were many aspects of the transcript that highlighted participants were aware that being underweight was as worrying as being overweight. However, across the board they were far more critical of individuals who were overweight and discussed wide ranging consequences for these individuals, this leads on to the next theme evident in the analysis.

Fat is bad

There was a united consensus that being fat was something to avoid, that it was a bad thing, and had typically negative consequences. Elements of this theme have been demonstrated throughout the discussion of the previous two themes; however, this illustrates how their understanding impacts on their attitudes toward obesity.

⋆: Like all the fat goes through your blood and stuff.
⋆: Like sugar, like all the sugar goes through your blood if you eat too much of it would clog up your arteries and you might die.

Boys year 6

I: Like how? What would happen to you? Is something going to happen straight away or is it something that's going to happen to.
⋆: You would get rotten teeth and you would not be as strong as you would be if you ate healthy and stuff.
⋆: You could die.

Girls year 6

⋆: Because fat would be horrible.
⋆: Because it's bad for you, because it looks bad.
⋆: Because people call you big fat.

Girls reception

In addition to the health issues and those relating to physical attractiveness were the issues of bullying and social exclusion, which seemed to play a big role in the children's understandings of what it would be like to be overweight. The stigma attached to being overweight is evident as participants often started giggling when talking about people being overweight.

I: Is it important to eat things that are good for you?
⋆: Laughter
I: What do you think happens to you if you eat lots of these biscuits?
⋆: Fat
I: And what good would stop you from getting fat, or would help you not be fat?
⋆: Giggling

Boys reception

Inability to have a successful career and even death were understood to be the results of obesity. Participants felt people who were overweight were in some way bad or an embarrassment. There was even a sense of fear toward people who they considered overweight, indicating that they would avoid being seen with somebody who was obese.

I: So ... so what do you think about being fat, like if you see somebody in the street who looks like they are not very healthy do you think?
⋆: They can't do much, like most of the things you want to do in life, like swimming, jogging.
⋆: Jobs when you grow older.

Girls year 6

⋆: Like if my parents were proper massive and I went to the town with them I would just say they took me to the town and I don't know them.

Boys year 6

It is clear that the participants' understanding is that obesity is a very negative issue. However, there is also evidence that they understand the complexity of the condition and are also aware being underweight maybe as much of a problem. The older children in this study seemed to understand that it is a complex issue and fully grasped the concept of moderation. They often refer to the fact that you can have a small amount of things that maybe classified as unhealthy, as long as you don't eat them all the time or balance them out with exercise.

I: And what sort of things for eating well?
*:   Like fruit and vegetables.
*:   Some Sugar.
*:   If you eat vegetables and fruit and you might get back to underweight.
*:   And you want to be in the middle.
*:   You need a bit of fat on you.

<div align="right">Girls year 6</div>

This category of Fat is Bad highlights an issue that clouds all the children's understandings of issues surrounding obesity and that is of conflicting messages. This notion of mixed messages forms the final theme evident in the data.

Mixed messages

The evidence presented here would suggest the information intended to educate and inform children is often met with equal amounts of contradictory or confusing messages and behaviours. The result of this is easily demonstrated by comparing what the children know they should be doing with what they actually talk about doing. For the majority of the participants their knowledge did not always match with their described behaviour, their food preferences often overriding their knowledge. This was perhaps not so surprising; knowledge does not by any means dictate behaviour.

I: Do you have breakfast most mornings? Do you normally have some breakfast, what do you normally have for breakfast?
*:   Miss I have chocolate cookies.
I: What did you have for your tea last night?
*:   I just had for my supper.
I: What did you have last night for your supper?
*:   Err sandwiches, cake and
I: What about what did you have last night for your tea?
*:   Pizza

<div align="right">Girls reception</div>

I: You eat two, two pieces of fruit?
*:   Yes, cos my mam chops it into two halves.

<div align="right">Boys reception</div>

Conflict existed in a number of forms in the understandings expressed by the participants. It is worth reiterating that the younger girls who participated believed treatment for obesity was to go to the hospital and have an operation—something they have picked up from a TV documentary—this conflicts with diet and exercise education they receive at school. Other participants gave more specific and direct examples of receiving contradictory information. This ranged from conflicts in direct health messages to conflicting information and action between school and home. They felt that at times it was difficult to know which information was the right information, not only was it conflicting but it was forever changing.

*:   And people say if you make fruit smoothies its healthy for you but it said in the news something about being obese again it said that if you drink a smoothie one a day you'll put on 13 pounds, that's nearly a stone in a year.

<div align="right">Boys year 6</div>

I: What about at home? You know if you're taught all this stuff at school what happens when you go home? Do Mum and Dad teach you the same things or is it different?
*:   Different
I: And why is it different?
*:   I eat more sweets.

<div align="right">Girls year 6</div>

In addition to this, older children also pointed out they felt that healthy lifestyle information wasn't always delivered in the correct manner, there was a belief that stigmatising people who were overweight was negative. There was an awareness that there is a psychological aspect to overeating, and in some individuals it is this that needs to be addressed. Moreover, there was a feeling again demonstrated solely by the older participants that being overweight/obese could be difficult to rectify and maintaining a healthy weight could be a challenge.

*:   So you need to be in the middle.
I: Is it easy to stay in the middle?
*:   No, because sometimes you can't be bothered to eat well and exercise.

<div align="right">Girls year 6</div>

I: Do you think it's quite easy to lose weight?
*:   Yes

*: Well for some people.

*: If you put your mind to it, it is.

I: No go on cos everyone's got different ideas.

*: You can't just lose weight quickly.

*: Cos my dad when he was young he was obese so he told me, but he's sort of addicted really.

*: Addicted to what.

*: Addicted he cannot stop but he's trying.

*: He cannot stop what.

*: Eating when he was young, he like learnt now he's saying to me about being fit cos he tells me about what happened when he was young so I try it.

Boys year 6

This understanding of the complex nature of the obesity problem, coupled with the confusion and conflict in both the information and behaviours the participants are exposed to, can help explain some of the barriers to individuals adopting a healthier lifestyle.

Discussion

Comprehensive understanding

The results detailed above highlight some important findings as to how children understand obesity in terms of some of its causes and consequences. It was particularly clear that knowledge, often imparted in a school setting, is getting through to the children who participated in this study. However, it appears equally evident that this knowledge in many cases does not transfer to behaviour. Further examination of the results allows us to explore the potential reasons behind the knowledge-behaviour gap.

Role models by their nature provide examples for both the children's beliefs and their behaviour. There are a wide variety of potential role models for children from parents, teachers, peers, and celebrities. What seems particularly important, in terms of being a positive role model with regards to healthy lifestyles, is that children have an opportunity to view the process of being healthy. In this study, this was typified by the examples of the Year 6 boys who participated in sport with their fathers. It appears this close and active relationship allows the knowledge that has been started at school to grow. Allowing children the opportunity to apply their knowledge and see the steps taken by a role model to get or stay fit help translate this knowledge into behaviour. What is interesting, however, is that it seems passive behaviours by role models can have the same impact. It was the case with these participants that the effect of passive knowledge transfer seemed to be more negative, but that is by

no means to say that passive behaviours by role models will not also encourage positive lifestyle behaviours in other cases. The most obvious example of this within this data set was the seemingly implicit messages that the girls received about being skinny. There was not an overtly explicit attempt on the behalf of the role models described here to encourage a "skinny" ideal; however, messages seemed to reach the participants that would indicate this is the case. The key difference between these active and passive role models appears to come from whether the role models place focus on the process; taking part in sport (in the example of the older boys) or outcome being skinny (in the example of the girls). Focus on the action of being physically active or enjoying a healthy diet in the case of these participants produces a healthier outlook on maintaining a healthy body weight. When that focus is on the outcome—the weight loss or the weight gain—there seems to be less concern for actually "being healthy" in terms of body weight and lifestyle. This notion about process and outcome is intrinsically linked to the theme of Fat is Bad.

It is interesting to note that whilst the children expressed an understanding of fat as a component of diet and were able to identify high fat foods and their link to obesity, the focus was on fat as an outcome and not so much about it as input. It is a well-documented fact that fat is a requirement of a balanced diet. The participants were able to recite in great detail the consequences of becoming fat but were not so forthright about the processes involved in becoming fat. It can be suggested that by focussing on the process of becoming fat and understanding the need for fat in moderation and being physically active it may help to discourage fat becoming the output. This may also help to draw away the focus from physical appearance that is so closely tied to the stigma attached to being overweight and place it on living a healthy lifestyle and being healthy.

The key finding of this study is that it is evident that children receive contradictory messages when it comes to following a healthy diet and taking part in exercise. The research presented here highlights children's understandings of some of the causes of obesity and the consequences of becoming overweight. However, it is equally evident that this information has reached them on a knowledge level but has not or cannot be fully translated into behaviour. It appears that central to this problem are the multiple discourses that exist around diet and exercise. Whilst government campaigns may impart facts and figures and provide advice on changes that can be made, there are a whole host of other sources to contend with. There is an undoubted role played

by the media both in terms of active advertising campaigns for junk food or sedentary games and the passive portrayal of unattainable body shapes and sizes in magazines and by celebrity culture. However, more than this, health messages are competing against a variety of cultural values, social, and personal norms that may well go against messages that encourage certain behaviours. What is more is that ultimately individuals have the power and autonomy to make their own choices about diet and exercise. Stakeholders need to ensure that people are in a position to make an informed decision and not one where their judgement is clouded by an array of contradicting messages. There is also a responsibility to ensure that individuals are able to act on advice given and to provide advice that is relevant and tailored to individual circumstances. It is easy to understand why parents on a low income may struggle to incorporate "5 a day" into their families diets when they perhaps don't have access to a car and the nearest shop selling fresh fruit and vegetables is several miles away. Ensuring people know that frozen fruits and vegetables are just as good and, in some cases better, is a far more useful and usable message.

Comparisons with past research

The objective of this study was to explore children's understandings of obesity in terms of diet and physical activity; the children included were considered high risk because of their socio-economic status. To meet this objective, focus group data was analysed using thematic analysis. This analysis produced key themes pertaining to the understandings of the participants. There is not a wealth of prior research in this domain and it was for this reason thematic analysis was chosen to analyse the data. The method proved to be particularly useful in generating these exploratory data that are discussed here in relation to previous findings.

The theme of knowledge has previously been identified by Hesketh et al. (2005) in terms of information and awareness that is pertinent to children's perceptions of healthy eating, activity, and preventing obesity. Increasing knowledge relating to diet and physical activity cannot prevent obesity but it can encourage children to make informed choices.

This study, as have others (Hesketh et al., 2005; Borra et al., 2003; Musaiger, Mater, Alekri, & Mahdi, 1991), identified misunderstandings in children's knowledge as barriers to healthful behaviour. It might be useful to address this issue, particularly with younger children who are developing their knowledge. Previous literature has identified young

children often consume their recommended daily intake of fruit but fall well short when it comes to vegetables (Dennison, Rockwell, & Baker, 1998). Government campaigns encourage people to eat five portions of fruit and vegetables a day (www.5a-day.nhs.co.uk); however, nutritionists would encourage three portions of vegetables and two of fruit—fruit having high sugar content. There was no evidence in the transcripts that any of the children were aware of or understood this distinction. This needs further investigation; however, education should encourage an understanding of fruit and vegetables as separate entities to help increase the consumption of vegetables (Gibson, Wardle, & Watts, 1998).

The evidence in this study suggests children grasp the causes of obesity, overeating, and low levels of physical activity; however, there was a general lack of understanding of the underlying physiological processes. There was a limited understanding of the concept of energy balance or that there might also be medical reasons for the obesity. Bell and Morgan (2000) demonstrated providing medical explanations for obesity can have a positive effect on children's attitudes to obese individuals. Overweight individuals were generally stigmatised by the participants in this study, so providing better medical information could help to alleviate these negative attitudes. It is fair to say those children who did have more in-depth knowledge of obesity were more sympathetic in their considerations of overweight individuals acknowledging the difficulty in making lifestyle changes.

The influence of parents concerning diet and exercise behaviours is well documented (Prout, 1996). Hesketh et al. (2005), Borra et al. (2003), and Young-Hyman et al. (2000) consider parental influence to be a determining factor in children's attitudes and understandings of obesity. It is clear this influence can be as detrimental as it can be beneficial. Previous research (Borra et al., 2003) argues interventions need to be developed that consider the role of the parent. Children cannot be expected to apply the information they receive at school to themselves if it is not reiterated at home. Nutritional education and physical education have not formed a core or extensive part of school curriculums in the United Kingdom in previous years, and there is now a generation of young parents who do not have the skills to attractively present appropriate foods (Tuttle & Truswell, 2002) or who regularly take part in sport themselves. The impact of this on their children's behaviour is that they don't always have examples of healthy behaviour to model their own on.

Of particular importance was the finding that children feel that they often receive mixed and contradicting messages. This is of great relevance when considering the development of policies and strategies that can be more effective. More over this backs up the findings of Dorey and McCool (2009) who conclude that nutritional messages evident in health promotion and advertising were often perceived by child audiences to be ambiguous. The authors warn that these contradictory messages could potentially serve to weaken the trustworthiness viewers have in health promotion initiatives. This really points to a key area in which health professionals can target efforts to tackle obesity. Clarity and consistency in healthy messages and recommendations are central to helping people take on board and act on the information they receive. Contradiction allows room for people to question the advice given and when effort is required to make a change in behaviour that change is less likely to be made if there is reason to doubt the accuracy of information. Furthermore, coherent messages need to consider person specific factors that may inhibit behaviour change; when individuals are encouraged to behave in a certain way but the constraints of day-to-day life lead to another, the results are confusion and hostility to the initial message (Owens & Driffill, 2008).

Procedural issues

The main methodological issue arising was participants from Reception struggled to engage fully in conversation, and the sessions followed a structure more a kin to an interview (i.e., question and answer). It was difficult to encourage responses that were longer than a few words; often one word responses were given. There is the potential to gain some very useful information from children in this age group; however, it can be a long and time-consuming process to elicit enough information to make the analysis process worthwhile. The length of the sessions also must be kept relatively short because attention spans are not long lasting; this was a finding similar to that of Miller (2000). The replica food items selected to help provide structure to the focus groups were useful and did provide a catalyst for discussion; however, for very young children (i.e., those in Reception) they resemble toys too closely, this then leads to them becoming more of a distraction, hindering the discussion. The use of the picture cards and pens and paper as suggested by Backett and Alexander (1991) provided a more a suitable means of structuring focus groups for young children.

There were at times issues with certain members of the groups making themselves heard more than others, thus the researcher had to encourage those happier to sit back and let others take the lead (Kirk, 2007). However, through a little encouragement all participants appeared comfortable talking with each other and participated equally, a result of the careful selection process. It also appeared to be beneficial speaking to boys and girls separately, with the boys often more excitable in their discussion style in comparison to the girls. It also facilitated the identification of some important issues, for example, the Year 6 boys identified eating behaviours present in the Year 6 girls that the girls themselves did not discuss.

Implications for the future

The Foresight Report (Department of Innovation Universities and Skills, 2007), in tackling obesity, points out that current policies are failing because they do not provide the depth and range of interventions needed. This present study has determined that central to children's understandings of the causes and consequences of obesity are the concepts of knowledge, the opportunity to apply this knowledge to their own lives, and the existence of role models to set an example. There exist certain myths and misconceptions that need to be addressed and children need to believe they can trust the health messages they receive because they are aware some messages are misleading or forever changing.

The key to this issue seems to be children learn by example, they can have all the knowledge in the world provided to them through an institution such as a school but this information needs to be supported by life at home. This provides evidence that campaigns need to target parents to tackle childhood obesity; this is an issue that policy makers are already aware of (National Institute for Health and Clinical Excellence, 2006). However, this means health messages delivered to the general public need to be clearer and avoid ambiguity. There needs to be careful considerations of the context in which health messages are received, taking into account the understandings of the target population (Hesketh et al., 2005).

There were some issues raised in the focus group that were beyond the scope of this particular study. There was a representation of different ethnic minorities in the groups, and slight differences in the understandings of these different groups were identified. Further research should investigate the understandings of different minority groups to see if ethnicity influences or results in divergent concepts. Future study also needs to look at strategies that

enable children to apply healthy lifestyle information to their own lives.

Children spend, on average, a quarter of their waking lives in schools; therefore, schools can be seen as an effective environment and source to help encourage healthy lifestyles. However, that leaves three quarters of a child's time in which they are out of the control of the school environment. Strategies must be developed to unite the teaching at school with practices in the home. This supports the conclusions of Hughes, Sherman, and Whitaker (2010) who write that strategies need to be framed in a manner that makes low income mothers feel more supported in addressing issues their children may have with their weight. Ensuring that approaches to encourage healthy lives take on a holistic format will also help to provide consistent and realistic role models. There needs to be a concerted effort from within society to develop role models who have a healthy relationship with food and exercise. These seem to already exist for young boys in the form of sporting heroes but seem in short supply for young girls who already consider that being healthy is the ideal but then look to surgery as a form of weight loss. Lieberman, Gauvin, Bukowski, and White (2001) highlight the importance of role models and peer influence in the onset of disordered eating in young girls and this needs to be seriously taken into account when sending out messages that being overweight is bad, girls need to be aware that being underweight also has severe health consequences.

In conclusion, the time children spend eating and taking part in physical activity out of school is likely to be the biggest challenge to preventing the continuing obesity problems in the United Kingdom, and this is where current strategies appear to be failing. Children understand obesity and its contributing factors in terms set out to them by those people they consider role models. It is only by helping these role models to provide consistent and reliable information by setting suitable active examples and by being aware of the impact of their passive actions that we can begin to address the problem of obesity.

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