

Healthy eating, activity and obesity prevention: a qualitative study of parent and child perceptions in Australia

K. HESKETH, E. WATERS, J. GREEN, L. SALMON and J. WILLIAMS

Centre for Community Child Health, Murdoch Childrens Research Institute and University of Melbourne, Royal Children's Hospital, Parkville, Victoria, Australia

SUMMARY

Preventative health strategies incorporating the views of target participants have improved the likelihood of success. This qualitative study aimed to elicit child and parent views regarding social and environmental barriers to healthy eating, physical activity and child obesity prevention programmes, acceptable foci, and appropriate modes of delivery. To obtain views across a range of social circumstances three demographically diverse primary schools in Victoria, Australia were selected. Children in Grades 2 (aged 7–8 years) and 5 (aged 10–11 years) participated in focus groups of three to six children. Groups were semi-structured using photo-based activities to initiate discussion. Focus groups with established parent groups were also conducted. Comments were recorded, collated, and themes extracted using grounded theory. 119 children and 17 parents participated. Nine themes emerged: information and awareness, contradiction between

knowledge and behaviour, lifestyle balance, local environment, barriers to a healthy lifestyle, contradictory messages, myths, roles of the school and family, and timing and content of prevention strategies for childhood obesity. In conclusion, awareness of food 'healthiness' was high however perceptions of the 'healthiness' of some sedentary activities that are otherwise of benefit (e.g. reading) were uncertain. The contradictions in messages children receive were reported to be a barrier to a healthy lifestyle. Parent recommendations regarding the timing and content of childhood obesity prevention strategies were consistent with quantitative research. Contradictions in the explicit and implicit messages children receive around diet and physical activity need to be prevented. Consistent promotion of healthy food and activity choices across settings is core to population prevention programmes for childhood obesity.

Key words: diet; obesity; physical activity; qualitative

INTRODUCTION

Overweight and obesity is increasing steeply in Australia (Magarey *et al.*, 2001; Booth *et al.*, 2001) and almost 25% of children are affected (Booth *et al.*, 2001) presenting a major challenge to develop contemporary, effective, population-based prevention and management strategies. To date, interventions have focused on improving the more amenable determinants of obesity: physical inactivity and consumption of energy-dense foods, but these have had limited

effectiveness (Campbell *et al.*, 2001). Intervention and strategy development, however, have largely overlooked the views of potential participants. Health promotion now recognizes the need to consult and engage people within the context of their community (Potvin *et al.*, 2003) and increasingly programmes aimed at improving the health of children are being designed in partnership with children and parents (Potvin *et al.*, 2003).

Nevertheless, research of community perceptions and recommendations for obesity prevention has focused on children's perceptions of body image, of how healthy both thin and overweight children are (Hill and Silver 1995), and professional (Chamberlin *et al.*, 2002) and maternal (Jain *et al.*, 2001) recommendations for obesity prevention in pre-school children and adolescents (Neumark-Sztainer *et al.*, 1999; Neumark-Sztainer *et al.*, 2000). There is an absence of published research relevant to the pre-adolescent school-aged population that has examined the views of children and their parents on how effective health promoting and sustainable obesity prevention programmes should be developed.

The aims of this study were to elicit the subjective views of primary school-aged children and parents in relation to: (i) perceptions, beliefs and attitudes towards social and physical environmental barriers to children's obesity prevention programmes and (ii) acceptable foci and modes of delivery of obesity prevention programmes for children.

METHODS

As the prevalence of overweight appears to be unequally distributed between population groups (Booth *et al.*, 2001; Waters and Williams, 2002), we aimed to access families from a range of social circumstances. We selected three demographically diverse primary schools in Victoria, Australia (Table 1); all agreed to participate. The study was conducted between November and December 2002.

Children—girls and boys—in Grades 2 (aged 7–8 years) and 5 (aged 10–11 years) were sampled to obtain views from children in the lower and upper primary school years. At the government schools, all children in these year levels were involved, whereas one class at each level was selected by the school principal at the independent school due to larger enrolment at this school (>25 students at each grade level).

Sampling children

Within each grade, semi-structured focus groups were held concurrently during class time, each led by a member of the research team. Focus groups comprised between three and six children, lasted approximately 30 minutes, were designed to be exploratory, and were structured around activities with accompanying questions designed to elicit discussion (Table 2). As children are more at ease conversing with peers than with adults (Mauthner, 1997), activities were designed to allow spontaneous discussion amongst the children, with the researcher acting as an observer and facilitator. The first activity involved prioritizing nine photographs of a range of healthy and unhealthy foods, the second involved sorting seven photographs of active and sedentary, indoor and outdoor activities, and the third activity involved discussion around a photograph of an overweight adolescent girl playing basketball. Photographs were used to encourage discussion amongst children, having previously been shown to be an effective method (Curtin, 2001). Each researcher kept a written record of the discussion of their focus groups including notation of children's responses, pertinent quotes, and facilitator observations.

Table 1: Description of schools and number of participants

Characteristic	School 1	School 2	School 3
School sector	Government	Government	Independent
Geographic location	Metropolitan	Rural	Metropolitan
Proportion of students receiving Education Maintenance Allowance*	50%	23%	0%
Ethnicity of families	Mixed	Predominantly Caucasian	Mixed
Students participating [<i>n</i> (response rate)]	38 (97%)	35 (85%)	46 (98%)
Parents participating, <i>n</i>	0	7	10

*Education Maintenance Allowance (EMA) provides an indication of the socio-economic status of a school population. The EMA is a means tested Victorian State Government allowance provided to assist low-income families with their child's education costs.

Table 2: Activities and questions used to promote discussion in child focus groups

Food photo sorting activity
Sort the photos from the healthiest to the unhealthiest
 Why are the foods healthy?
 What happens when we eat unhealthy foods?
Sort the photos from what you like to eat most to what you dislike eating
 Why do you like some foods?
 Why don't we always eat healthy foods?
 What foods should you eat more of?

Activity photo sorting activity
Sort the photos from the healthiest to unhealthiest activities
 Why are some activities healthier than others?
Sort the photos from most often to least often undertaken
 What would you like to spend more time doing?

Photo of an obese adolescent playing basketball
 What do we see in this photograph?
 Develop any observations related to obesity
 How do you think this happened?
 Does it matter?
 What should we do?

Additional questions
 Tell me about things about your school that you think are healthy
 Is there anything you think is not healthy?
 Anything you would like to change?
 What about life in general outside school—what could be done to make it healthier?

Sampling parents

Access to parents was facilitated by the school principal. For two of the schools we engaged with parents within already established parent groups, a Parents' Association and a weekly parent information and discussion session open to all parents. However, despite many alternative attempts it became apparent that it was very difficult to engage groups or individual parents from the lower socio-economic and ethnically diverse families of the inner city school in this study, due to vastly lower levels of parent engagement in school activities. In consultation with the principal we decided it was not possible in this instance to elicit their views using this methodology. (Note: the researchers are continuing to investigate more appropriate methods for engaging parents from these backgrounds.)

A series of questions were used to promote discussion (Table 3), however the focus group sessions were designed to be exploratory and relatively unstructured, allowing new ideas and interesting insights to be pursued. Sessions lasted approximately 45–60 minutes; one researcher led the discussion whilst another observed

Table 3: Questions used to promote discussion in parent focus groups

Overweight and, at its worst, obesity in young people is a common and persistent health problem. Why is it so significant in our community?
 What is the school role in developing healthy environments and behaviours in children and families?
 How does the school responsibility compare with parent and community responsibilities in developing healthy environments, attitudes and behaviours?
 What can school communities do to encourage healthy environments and behaviours?
 What more could be done to encourage more healthy environments and behaviours, especially those that may address this issue?

and generated a written record of relevant discussion points and quotes.

Researchers' records from the child and parent focus groups were collated. A single researcher coded each comment, quote and observation recorded from all the focus groups and then grouped those with similar content. From these groupings, themes were extracted which represented the main messages conveyed by the focus group data. A second researcher independently read the focus group records and confirmed the themes that were extracted from the data. These themes were discussed with all six facilitators/researchers for further validation.

Ethics approval was received from the Royal Children's Hospital (Melbourne, Australia) Ethics in Human Research Committee and the Victorian Government Department of Education. A parent/guardian of each participating child provided written informed consent and children provided verbal assent prior to commencement of the focus groups. Parents provided written informed consent for their own participation.

RESULTS

119 children (94% response rate) and 17 parents (two fathers, 15 mothers) participated (Table 1). The high child response rate across each school ensured a sample of children covering the spectrum of body mass index (BMI).

Themes arising

Information and awareness. Children were generally well informed about the health value

of different foods, could identify the healthy and unhealthy foods pictured, and were aware of the nutrients contributing to their perception of foods being more or less healthy. Many mentioned food labels as a source of information on the health value of foods and some discussed the health consequences of eating healthy [*'you lose weight if it's fat free'* (Grade 5); *'it makes your bones stronger'* (Grade 5)] and unhealthy foods [*'make your arteries block'* (Grade 5); *'make you sick'* (Grade 2)]. Younger children often used the absence of packaging, or the ability to identify the source of a food [*'milk comes from cows'* (Grade 2), *'fruit grows on a tree'* (Grade 2)] as an indicator of healthiness. However, many children found the coupling of 'healthy' and 'unhealthy' foods or preparation methods confusing. For example, *'chips [fries] are healthy because they're potato and that's a vegetable, which is healthy'* (Grade 2) competed with *'but they have salt and fat so they're unhealthy'* (Grade 2); *'Big M is healthy because milk is natural, it comes out of cows. The flavouring is only 1%'* (Grade 5) competed with *'milk is healthy but chocolate is unhealthy so chocolate milk is unhealthy'* (Grade 5).

Most children easily identified physically active pursuits as healthy and discussed the benefits of physical activity including fitness and fat reduction. They related the amount of movement involved in an activity with the health benefit provided; *'cricket is not as healthy as other sports because you stand around a lot'* (Grade 5). However, there was more diverse opinion on sedentary activities, such as computer use or creative play. *'Some computer programmes teach you things so that's healthy'* (Grade 2). Some children clearly believed sedentary activities were unhealthy, while others engaged in complex debate around the relative benefits of 'body healthy' versus 'brain healthy' activities. *'All the [activities in the] pictures are healthy. Some are healthy for the brain'* (Grade 5). In particular, many children were reluctant to rate school work and reading as unhealthy.

Parents believed their children knew which foods were healthy, but suspected they did not fully comprehend the consequences of eating unhealthy foods. Parents believed that children had not internalized the messages about eating unhealthy foods in the same way they had embraced messages about the negative health effects of smoking, for example. They postulated that the inconsistent messages about unhealthy

energy-dense foods, including attractive marketing and advertising strategies, confused children.

Parents themselves, although generally well informed, requested more parent education on healthy eating for children. In particular, they did not feel well equipped to distinguish between more and less healthy pre-packaged snacks in light of the huge array available and marketed to children. *'There's so much deception in marketing, it's hard to know which snacks are healthy'* (parent). Parents also reported the need for strategies to encourage their children to eat healthy foods and be more physically active, and strategies to resist the demands of their children for unhealthy foods.

Contradiction between knowledge and behaviour

Despite distinguishing the relative health value of different foods and activities, most children reported that they regularly ate unhealthy foods and frequently spent their unstructured time in sedentary pursuits. Children clearly exhibited a preference for the less healthy foods [*'I'd like to eat [fast food chain] everyday'* (Grade 2); *'it would be good if they could make broccoli taste good like chocolate'* (Grade 5)] but described their meals at home to be predominantly healthy. Conversely, similar proportions of children communicated a preference for sedentary and physically active pursuits. Parents were aware that their family diet and activity levels were not as healthy as they would like, despite their knowledge and awareness of what comprises a healthy lifestyle. They reported that lifestyle demands and pressure from their children as a result of advertising and child peer pressure were the main barriers.

Lifestyle balance

Children discussed the idea of a balanced diet; *'you get sick of eating the same foods every day so we eat a bit of everything in the photos'* (Grade 2). They recognized the use of unhealthy food as 'treats' or 'special occasion food' [*'you know it's healthy if you're allowed to have it all the time without asking [permission to have it]'* (Grade 5)].

Some children had an understanding of the energy intake–energy expenditure model. However, many believed that even small amounts of physical activity could counteract over-consumption of unhealthy foods. Some children

were confused about the relative effect of combining healthy and unhealthy activities; *'I walk to the shop every day to buy hot chips – is that healthy or unhealthy?'* (Grade 5).

Parents were conscious of not wanting to be too restrictive on the types of food they permitted their children to consume. *'Lunch orders are a treat and there's peer pressure against the healthy options'* (parent). All believed it was important to allow their children 'treats'. However, a range of views was expressed on how frequently children should be given food treats. The majority of parents thought that daily food treats were acceptable [*'School lunch is only one meal of the day. If it's balanced throughout the day [by the other meals] it's OK for kids to have treats in their lunch.'* (parent)], although a small number thought that food treats once a week was sufficient [*'We use the canteen as a treat – once a week or once a fortnight a pie is OK'* (parent)].

The local environment

The local environment, both their school and wider community, plays a role in shaping children's physical activity. Children indicated a high degree of integration with the local community; natural (ocean, paddocks) and built (bike paths, parks) resources were frequently utilized for physically active pursuits. Children also recognized the features of their school environment that encouraged activity, both incidental [*'you have to climb the stairs all day at school and that makes you healthy'* (Grade 5)] and planned [*'we have lots of sports equipment at school to play with'* (Grade 5)].

Parents also acknowledged that the local environment has an important role for encouraging children's physical activity and cited local community facilities such as playgrounds, bike tracks and sporting facilities as encouraging children to be physically active. They reported that their children frequently used the available facilities but expressed a need for a greater number and variety of facilities, particularly in light of the decreasing size of backyards.

Barriers to a healthy lifestyle

As well as providing opportunities for physical activity, children identified aspects of their local environment that hindered physical pursuits. Car fumes, pollution, roads which were unsafe for child cyclists, lack of playground equipment, neighbours who protested at the noise generated by children

playing outdoors, and general safety concerns were all nominated as barriers to children being more physically active in their local community. Children from lower socio-economic families reported that money is a barrier to participating in extracurricular activities and to physical activity generally: *'I used to ride [my bike] every day until I got a puncture [and my mum can't afford a new tyre]'* (Grade 5).

Many children suggested that *'junk foods are irresistible'* (Grade 5) and *'unhealthy food tastes good and is addictive'* (Grade 5). They recognized that advertising and packaging of unhealthy foods makes it appealing and suggested there should be more advertising of healthy foods and the effects of healthy and unhealthy foods on their bodies. The high number of unhealthy food options on school canteen menus was reported as a barrier to healthy eating.

Parents similarly recognized that aspects of the local environment could discourage children's physical activity and healthy eating. Safety concerns and the increasing distances between children's homes and schools were cited as the main obstacles to physical activity in addition to distractions within the home (such as televisions and computers), small backyards, and reduced time for physical activity at school. *'About 70% of our kids get the school bus because they live too far away from school to walk'* (parent). Lack of parent time was reported to be a major barrier to children participating in organised sport. Increasing numbers of fast food outlets and unhealthy options in school canteens were seen as obstacles to healthy eating. *'The issue is that kids buy stuff at the canteen and share it with their friends so kids whose parents don't want them eating at the canteen, they still get the [unhealthy] food'* (parent). Parents acknowledged child peer pressure as a major barrier to healthy lifestyle; the difficulty of enforcing healthy eating and limiting sedentary activities when their children want to conform to what their friends are eating and doing.

Contradictory messages

We elicited a number of contradictions in the messages children are receiving, which create confusion and may hinder children's ability to make healthy lifestyle decisions. Messages about the concurrent health benefits and detriments of eating particular foods or participating in particular activities is common; *'food with fat in it is unhealthy'* (Grade 2) but *'we need some fat or*

you get too skinny' (Grade 2); *'salt stops cramps'* (Grade 5) but *'salt makes your heart harden'* (Grade 5); *'meat has iron'* (Grade 2) but *'meat has fat in it'* (Grade 2); *'computer and television are unhealthy for you'* (Grade 2) but *'some computer programmes teach you things so that's healthy'* (Grade 2) and *'some television is educational'* (Grade 5) and *'we use computers at school'* (Grade 2).

Children appear to believe that school, and anything permitted at school, is inherently healthy. This impression was confirmed within both parent groups. Contradictions between the overt and covert messages children are receiving at school underpinned extensive debate amongst the children as to the relative healthiness of particular foods and activities. In particular, many foods that children are taught to recognize as unhealthy are available at the school canteen resulting in some children believing that *'they're not really bad for you'* (Grade 2).

Myths

Myths emerged in both the children's and parents' discussions. Children believed that products labelled 'diet' were healthy, and that foods derived from natural products were healthy regardless of the content of the final product; *'you pick fruit from a tree so fruit juice is good for you'* (Grade 2). They believed that poor people cannot afford healthy food and that there is a lack of healthy food available in shops because farmers do not grow enough. Children reported that eating fruit before junk food counterbalances the effects of junk food, and salt is good for you because it helps your blood flow. Further, children viewed that any amount of body movement constituted physical activity; *'playing piano or computer is a bit healthy because you're moving your fingers'* (Grade 2).

Some parents believed it was fine for children to have unhealthy school lunches as this was only one meal of the day and would be counteracted if the remaining daily meals were healthy. Many parents believed that daily 'treats' of unhealthy food snacks were acceptable and could be part of a healthy diet; *'I don't consider a packet of [sweet biscuits] junk food, I consider [fast food outlet] junk food'* (parent).

Roles of the school and the family

Parents consistently identified separate but complementary roles of schools and families in

encouraging healthy lifestyles and obesity prevention. They acknowledged the large amount of time children spend at school and the strong influence of peer interactions at school. Parents expect schools to take a role in setting a good example for children, both through the educational messages provided and through the general policies and school environment. However, the role of the school was considered secondary to that of the family; the main responsibility for engendering healthy lifestyle was seen to lie with parents.

Timing and content of prevention strategies for childhood obesity

There was consensus amongst parents that obesity prevention strategies needed to begin early in a child's life, long before they reached the school setting. Parents recognized that behaviours are shaped early in life and were largely already entrenched by the time children reached school age. *'The problems are already there way before kids get to school'* (parent). Parents acknowledged that children were exposed to peer pressure in child playgroups, and to advertising messages for unhealthy foods at a very young age. *'Even in playgroups there is [peer] pressure. If one mother gives certain foods the other kids want it and the other mothers feel they should keep up'* (parent). Thus, they believed that leaving healthy lifestyle education until children reached school gave unhealthy lifestyle messages a head start. *'Children see advertising [for unhealthy foods] from a very young age, but don't learn about healthy food until they get to school'* (parent).

Parents strongly believed they should play an important role in any obesity prevention strategies. They did not believe real and lasting behaviour change can be achieved by targeting children alone, suggesting strategies should target parents also. They recognized the important role of parents and teachers to model healthy lifestyles rather than merely to encourage children to consume healthier diets and increase physical activity. *'When we [our school] had parents and teachers running or walking with the kids, the kids were much more enthusiastic about doing it'* (parent). Parents believed the content of obesity prevention strategies should extend beyond education; they were enthusiastic about attempting innovative strategies both at home and within the school setting.

DISCUSSION

Parent recommendations regarding the timing and content of childhood obesity prevention strategies concur with epidemiological studies: parents suggested that prevention needed to begin before children were at school. With almost one-fifth of children already overweight at age five (Booth *et al.*, 2003), the usual age of school entry, school-based prevention strategies alone are too late to prevent overweight for this population of children. However, school-based strategies may be able to attenuate change over time.

Existing evidence demonstrates that effective early childhood interventions can change the balance between risk and protective factors (Shonkoff and Phillips, 2000); therefore, earlier intervention for childhood overweight and obesity is likely to shift the odds in favour of a more desired outcome. However, the range of heterogeneous services and environmental settings in which children spend their time during early childhood does not provide a systematic opportunity to engage families and children in healthy eating, physical activity promotion and obesity prevention efforts, with the exception of broad-based community strategies. Thus, the potential utility of the school environment as a base for intervention strategies cannot be dismissed. Certainly the finding that children believe anything permitted at school is inherently healthy points to both the importance of schools as models of healthy environments and the unique opportunity provided to schools to expose children to healthy behaviour. This is particularly relevant for children who may not have exposure to such experiences in their family environment. For example, whilst many parents in this study believed that daily food treats (unhealthy foods) were acceptable, schools may be able to alter children's and families' perception of what constitutes a treat by providing healthy foods in their canteens and as part of their fundraising activities.

In relation to parent involvement, there is extensive evidence that parent behaviour influences what children learn, how children respond to the external environment, and what children expect of themselves (Shonkoff and Phillips, 2000). Thus, it is concerning that many parents in this study expressed beliefs and described behaviours which are at odds with current thought on obesity prevention strategies (for example, that daily food treats are acceptable).

Coupled with the success of treatment interventions for childhood obesity which have involved parents and families, over those targeting children alone (Shepherd *et al.*, 2002; Summerbell *et al.*, 2003), prevention strategies involving parents as well as children have greater likelihood of success. Schools and communities therefore have a role in engaging parents in health education, behaviour change strategies and environmental modifications (e.g. influence on school food outlets, access to physical activity opportunities and school policies).

The views elicited from children and parents were generally consistent. Clearly apparent was the need for consistency in both explicit and implicit healthy lifestyle messages children receive around food and activity choice. The anti-smoking health promotion campaigns provided clear and consistent messages about smoking. Legislation around smoking in schools and public places sends a clear message that this is an unhealthy activity. The ban on advertising of tobacco related products has meant children are not exposed to attractive or enticing portrayals of smoking, instead, the only advertising they see is of the negative health consequences of smoking. Unlike smoking, both diet and activity exist on continuums. Whilst this makes it more difficult to draw the line between the healthy and unhealthy for the purpose of health promotion, it is still possible and important to provide clear and consistent messages to children about healthy food and activity choices. Eliminating the contradictions and consistently promoting the healthy choices across settings represented important steps in health promotion aimed at preventing obesity.

A limitation of this study was the inability to access parents from culturally diverse and lower socio-economic groups, despite access to their children. Lower literacy rates and lower rates of school involvement amongst parents from these groups are likely to have contributed. The views and issues raised by these parents may well have added to those expressed by the parents at the other two schools. However, the issues raised by the parents that we were able to access are no less valid, and strategies for their engagement are a priority.

Whilst child BMI was not obtained for the study, based on the high response rate for the child focus groups, combined with the fact that approximately one-quarter of all primary school children are overweight (Booth *et al.*, 2001), it can be assumed that the views obtained in this study came from

children who spanned the BMI spectrum. The beliefs expressed did not appear to differ between children who were overweight and those who were not. The parents in this study were a self-selected group, and may not have been truly representative of the school parent communities in terms of BMI, socio-demographics, knowledge, awareness or other values; however, the views of parents accessed at the two schools were strikingly similar, despite the schools being quite diverse.

Despite the high levels of child and parent knowledge about healthy foods and activities, this knowledge did not generally translate into reports of consistently healthy behaviours. It is crucial that the importance of a healthy lifestyle for all children be clearly understood by parents as many in this study, whilst acknowledging the enormity of the obesity problem for children in general, had not internalized the issue as relevant to their own child or family. Parents and children are enthusiastic and receptive to innovative strategies, which overcome the barriers to a healthy lifestyle and make it easier to make healthy food and activity choices. The education setting is but one arena in which to develop practical strategies to prevent obesity in children. It is likely that concurrent and inclusive strategies will need to be established across a variety of settings to ensure consistent messages are relayed to children and their parents.

ACKNOWLEDGEMENTS

We would like to acknowledge the contribution of Jeff Northfield in developing the methodology for the focus groups and for his involvement in running the focus groups. This study was funded by a small grant from the Murdoch Childrens Research Institute. K.H. is supported by a National Health and Medical Research Council Public Health Postgraduate Scholarship.

Address for correspondence:

Kylie Hesketh
Centre for Community Child Health
Royal Children's Hospital
Flemington Road
Parkville VIC 3052
Australia
E-mail: kylie.hesketh@mcri.edu.au

REFERENCES

- Booth, M. L., Chey, T., Wake, M., Norton, K., Hesketh, K., Dollman, J. and Robertson, I. (2003) Change in the prevalence of overweight and obesity among young Australians, 1969–1997. *American Journal of Clinical Nutrition*, **77**, 29–36.
- Booth, M. L., Wake, M., Armstrong, T., Chey, T., Hesketh, K. and Mathur, S. (2001) The epidemiology of overweight and obesity among Australian children and adolescents, 1995–97. *Australian and New Zealand Journal of Public Health*, **25**, 162–169.
- Campbell, K., Waters, E., O'Meara, S. and Summerbell, C. (2001) Interventions for preventing obesity in childhood. A systematic review (Cochrane Review). *Cochrane Database Syst. Rev.*, **1**.
- Chamberlin, L. A., Sherman, S. N., Jain, A., Powers, S. W. and Whitaker, R. C. (2002) The challenge of preventing and treating obesity in low-income, preschool children: perceptions of WIC health care professionals. *Archives of Pediatrics and Adolescent Medicine*, **156**, 662–668.
- Curtin, C. (2001) Eliciting children's voices in qualitative research. *The American Journal of Occupational Therapy*, **55**, 295–302.
- Hill, A. J. and Silver, E. K. (1995) Fat, friendless and unhealthy: 9-year old children's perception of body shape stereotypes. *International Journal of Obesity and Related Metabolic Disorders*, **19**, 423–430.
- Jain, A., Sherman, S. N., Chamberlin, D. L., Carter, Y., Powers, S. W. and Whitaker, R. C. (2001) Why don't low-income mothers worry about their preschoolers being overweight? *Pediatrics*, **107**, 1138–1146.
- Magarey, A. M., Daniels, L. A. and Boulton, T. J. (2001) Prevalence of overweight and obesity in Australian children and adolescents: reassessment of 1985 and 1995 data against new standard international definitions. *Medical Journal of Australia*, **174**, 561–564.
- Mauthner, M. (1997) Methodological aspects of collecting data from children: lessons from three research projects. *Children and Society*, **11**, 16–28.
- Neumark-Sztainer, D., Martin, S. L. and Story, M. (2000) School-based programs for obesity prevention: what do adolescents recommend? *American Journal of Health Promotion*, **14**, 232–235.
- Neumark-Sztainer, D., Story, M., Perry, C. and Casey, M. A. (1999) Factors influencing food choices of adolescents: findings from focus-group discussions with adolescents. *Journal of the American Dietetic Association*, **99**, 929–937.
- Potvin, L., Cargo, M., McComber, A. M., Delormier, T. and Macaulay, A. C. (2003) Implementing participatory intervention and research in communities: lessons from the Kahnawake Schools Diabetes Prevention Project in Canada. *Social Science and Medicine*, **56**, 1295–1305.
- Shepherd, J., Garcia, J., Oliver, S., Harden, A., Rees, R., Brunton, G. and Oakley, A. (2002) *Barriers to, and facilitators of the health of young people: a systematic review of evidence on young people's views and on interventions in mental health, physical activity and healthy eating*. EPPI-Centre, Social Science Research Unit, London.
- Shonkoff, J. P. and Phillips, D. A. (2000) Nurturing relationships. In Shonkoff, J. P. and Phillips, D. A. (eds), *From Neurons to Neighbourhoods: The Science of Early Childhood Development*. National Academic Press, Washington DC.
- Summerbell, C. D., Ashton, V., Campbell, K. J., Edmunds, L., Kelly, S. and Waters, E. (2003) Interventions for treating obesity in children. *Cochrane Database Syst Rev*, **3**.
- Waters, E. and Williams, J. (2002) Socio-cultural inequalities of child overweight and obesity. *Proceedings of the International Conference in Equity in Health*, Toronto, Canada.