

Short Communication

Developing a nutrition intervention in children's centres: exploring views of parents in rural/urban settings in the UK

Heather R Ohly¹, Arabella Hayter², Clare Pettinger³, Hynek Pikhart², Richard G Watt² and Gail A Rees^{1,*}

¹School of Biomedical and Biological Sciences, University of Plymouth, Drake Circus, Plymouth PL4 8AA, UK:

²Department of Epidemiology and Public Health, University College London, London, UK: ³School of Health Professions, University of Plymouth, Plymouth, UK

Submitted 16 December 2011: Final revision received 14 June 2012: Accepted 17 July 2012: First published online 31 August 2012

Abstract

Objective: The present study explored parents' requirements for healthy eating support prior to the development of a tailored intervention.

Design: A cross-sectional study of parents attending children's centres.

Setting: Children's centres in Cornwall (rural south-west England) and Islington (urban London borough).

Subjects: A total of 261 parents (94.2% female) of pre-school children (aged 2–5 years) completed a questionnaire on factors influencing food choice, and preferences for and views on healthy eating support.

Results: Parents reported that health, taste, freshness and quality were the most important factors influencing their food choices for their pre-school children. The importance of individual factors varied according to level of educational attainment. Over a third (38%) of parents said they wanted more advice on healthy eating for children. Less educated parents showed the greatest interest in learning more about several aspects: what a 'healthy diet' means, how to prepare and cook healthy food, how to understand food labels, budgeting for food, examples of healthy food and snacks for children, appropriate portion sizes for children and ways to encourage children to eat well.

Conclusions: There was demand for healthy eating support among parents of pre-school children, especially those who are less educated, in one rural and one urban area of England.

Keywords
Nutrition
Intervention
Children
Parents

The most recent National Diet and Nutrition Survey in the UK showed that the diets of children aged 1.5–3 years contained less than the recommended amount of fruit and vegetables⁽¹⁾. Almost a third of toddlers' non-milk extrinsic sugars intake was from drinks including soft drinks (12%) and fruit juice (15%), despite advice from health professionals to give under-5s water and milk between meals and diluted fruit juice at mealtimes only⁽²⁾. Eating habits developed in childhood are likely to persist into adulthood, so it is important that such nutritional issues are addressed⁽³⁾.

Large-scale nutrition interventions in the UK have also focused mainly on school-aged children^(4–6). There is a lack of evidence from the UK to facilitate the implementation of effective healthy eating programmes targeting pre-school children⁽⁷⁾. One major national intervention is Mini-MEND, a healthy lifestyle programme for families with overweight children aged 2–4 years⁽⁸⁾, but early evaluations did not

include dietary assessments⁽⁹⁾. In the USA and Australia, recent pre-school nutrition interventions have been more rigorously designed and evaluated, showing significant dietary improvements^(10–12). These complex interventions involved parent education programmes and community capacity building and were developed through consultation with stakeholders including parents. This kind of consultation with parents has been recommended in the UK to develop food and nutrition interventions in early years settings⁽¹³⁾.

Parents are the primary food providers for young children, as well as being important role models⁽¹⁴⁾. However, parents' food choices on behalf of their children may be influenced by a multitude of factors. A study in Southampton found that women of low educational attainment felt a lack of control over food choices for themselves and their families because of the cost of healthy food, the need to avoid waste, the temptation to

*Corresponding author: Email gail.rees@plymouth.ac.uk

snack and limited cooking skills⁽¹⁵⁾. It is important that we further investigate the factors influencing food choice, which may vary geographically, so that we can develop appropriate and effective interventions involving parents.

The current exploratory study was undertaken to inform the development of a family-centred nutrition intervention, to be delivered in children's centres in two distinct geographical locations (one urban and one rural) in the UK. Children's centres are Government-funded early years settings where children under 5 years of age and their families can receive integrated services and support, such as access to health and parenting services, advice and information on healthy lifestyles, training and return to work, and (in some areas) high-quality early years child care⁽¹⁶⁾. It was considered essential to consult parents in this study to ensure that the resulting intervention met their needs and addressed the real-life challenges of providing a healthy diet for young children.

Therefore, the aims of the present study were: (i) to explore factors influencing parental food choices for their children and (ii) to assess parents' views and perspectives on healthy eating support.

Methods

A cross-sectional questionnaire study of parents attending children's centres in two contrasting rural and urban locations was undertaken. The study received ethical approval from Camden and Islington Community Research Ethics Committee (REC reference: 09/H0722/56).

Study populations

Cornwall (rural study location) and Islington (urban study location) were chosen to represent the diverse range of low-income communities across England. Cornwall has a history of disadvantage arising from its isolated geographical location and the decline of traditional industries. Its most deprived district, Penwith, was ranked the 21st most deprived district in England in 2007⁽¹⁷⁾. The Borough of Islington is located in inner London and was ranked the sixth most deprived district in England in 2007⁽¹⁷⁾. The two locations have very different ethnic profiles. The population of Cornwall was 97% white British in 2001, compared with 57% in Islington and 87% in the whole of England⁽¹⁸⁾.

Sampling

Children's centres in each geographical location were randomly selected to participate in the study. Based on the results from a similar study investigating barriers to healthy eating and physical activity in school-aged children in New Zealand (n 101)⁽¹⁹⁾ and sample size estimation using intra-cluster correlation, a minimum sample size of 200 parents was required. Based on an estimate of approximately fifteen parents participating on average in each centre, fifteen children's centres (30% of total) were

randomly selected across the two locations (10/34 in Cornwall and 5/16 in Islington). The selected centres were contacted for permission to collect data. At the individual level, parents were included if they had a child aged 2–5 years without any medical dietary requirements. Mothers and fathers were included, but only one parent per family.

Questionnaires

The questionnaire was developed specifically for the current project, to further explore themes that emerged from previous focus groups with different groups of parents (findings to be published separately). Some questions, for example those on food choice, were modified from other relevant validated questionnaires^(10,20,21). The draft questionnaire was piloted with parents (n 14) to ensure that it was clear, unambiguous and could be completed within 15 min.

The final questionnaire consisted of a variety of multiple-choice and open-ended questions. First, parents were asked about basic demographic and social characteristics such as gender (parent/child), age (parent/child), marital status, ethnicity, employment status and educational attainment. Level of educational attainment was grouped into three categories: 'low' (none or GCSE), 'medium' (A Level or Diploma) or 'high' (university or professional qualification). Parents were asked about factors influencing food choice: 'It is important to me that the food I serve to my child on a typical day is ... familiar to my child; something my child likes; something the whole family likes; quick and easy to prepare; easily available in local shops or markets', etc. They were asked to indicate whether each factor was 'very important', 'moderately important' or 'not important'. Parents were then asked what sort of healthy eating support they would like: 'Which of the following would you find useful at your children's centre? Learning about what is a healthy balanced diet; preparation and cooking of foods; recipe ideas for the children; overcoming fussy eating; introducing new foods', etc. Parents were asked to indicate whether each one would be 'very useful', 'moderately useful' or 'not useful'. Space was available for parents to add their own suggestions about support they would like regarding healthy eating.

Data collection

The questionnaire was self-administered by parents, the majority of whom were approached face-to-face to encourage participation. It was produced in English only, so ability to comprehend English was a prerequisite for participation. Parent and child play sessions were visited by the researchers. All parents in attendance with a child aged 2–5 years were asked to complete the questionnaire at their leisure during the session. The researchers briefly explained the purpose of the questionnaire, provided further written information about the study, and then took written consent

prior to participation. In some cases, members of staff were given additional questionnaires to distribute at other sessions. Each parent was given the opportunity to enter a prize draw, as an incentive to take part.

Statistical analyses

Data were analysed using the SPSS statistical software package version 17.0 and the following statistical tests: Pearson χ^2 and χ^2 test for trend (when appropriate for ordinal exposures) for categorical outcomes; and independent-samples *t* test for continuous outcomes. A *P* value of less than 0.05 was regarded as statistically significant.

Parents were compared by level of educational attainment to identify the type of parents in greatest need of nutrition intervention. Results are presented for both locations combined unless otherwise indicated. Parents were also compared between the two locations, to identify any geographical differences in factors influencing food choices and healthy eating support required. Only statistically significant differences between Cornwall and Islington have been reported.

Results

Response rate

The questionnaire was completed by 261 parents, which represents 57% of the questionnaires distributed by

researchers and children's centre staff (160/254 in Cornwall; 101/206 in Islington; 261/460 in total). This number is likely to be an underestimate of the real response rate as it is not possible to estimate what proportion of questionnaires was distributed by centre staff.

Sample characteristics

The parents in Cornwall were generally younger ($P=0.01$), more likely to be married or cohabiting, less ethnically diverse and less likely to be working full-time (all $P<0.01$; Table 1). There was no significant difference in educational attainment between the two locations. Most of the respondents were female (94.2%). This was not intentional but reflects the gender split of parents encountered during recruitment.

Factors influencing food choice

The most important factors influencing parents' food choice on behalf of their children were: how healthy the foods were, the taste of food, the freshness and quality of food (>80% said very important). Some factors influencing food choice were considered more important by less educated parents: the familiarity of food to the child ($P<0.001$), food being liked by the whole family ($P=0.03$) and the affordability of food ($P<0.01$; Table 2). In contrast, the freshness and quality of food was considered to be more important by more educated parents ($P=0.04$; Table 2). When comparing the two locations, the

Table 1 Sociodemographic profile of the sample according to study location: parents and their pre-school children (age 2–5 years) attending children's centres in Cornwall (rural south-west England) and Islington (urban London borough)

Characteristic	Total sample (n 261)	Cornwall (n 160)	Islington (n 101)	<i>P</i>
Child gender (%)				
Male	52.5	50.6	55.4	0.449*
Female	47.5	49.4	44.6	
Child age (months)				
Mean	32.3	31.9	32.9	0.496†
SD	11.2	11.9	10.1	
Parent gender (%)				
Male	5.8	4.4	8.1	0.215*
Female	94.2	95.6	91.9	
Parent age (years)				
Mean	33.5	32.6	34.8	0.01†
SD	6.6	6.0	7.2	
Marital status (%)				
Married or cohabiting	77.6	89.2	58.8	<0.01*
Single, divorced or widowed	22.4	10.8	41.2	
Ethnicity (%)				
White British	75.3	93.1	46.5	<0.01*
Other ethnicity	24.7	6.9	53.5	
Employment (%)				
Employed full-time	12.0	6.9	20.0	<0.01*
Employed part-time	23.2	27.0	17.0	
Unemployed	13.5	6.9	24.0	
Not working	42.9	50.9	30.0	
Other	8.5	8.2	9.0	
Level of education (%)				
Low	31.6	31.2	32.3	0.295*
Medium	36.8	40.1	31.2	
High	31.6	28.7	36.6	

*Pearson χ^2 test.

†Independent-samples *t* test.

Table 2 Percentage of parents who thought the factors influencing food choice listed were very important, according to level of educational attainment: parents of pre-school children (age 2–5 years) attending children's centres in Cornwall (rural south-west England) and Islington (urban London Borough)

	Level of education			P*
	Low	Medium	High	
	%	%	%	
Familiar to my child	43.4	28.2	14.5	<0.001
Something my child likes	61.8	50.0	50.6	0.17
Something the whole family likes	44.6	31.8	27.3	0.03
Quick and easy to prepare	21.9	10.7	23.4	0.79
Easily available in local shops or markets	45.8	32.1	37.7	0.32
Fresh and good quality	79.7	75.6	92.4	0.04
Not expensive	38.4	36.1	18.4	<0.01
Tastes good	84.9	77.6	87.0	0.72
Contains no artificial ingredients	59.7	53.0	65.4	0.46
Healthy	89.5	77.6	87.3	0.73

* χ^2 test for trend (n 261).

Table 3 Percentage of parents who thought the options for support listed would be very useful, according to level of educational attainment: parents of pre-school children (age 2–5 years) attending children's centres in Cornwall (rural south-west England) and Islington (urban London Borough)

Learning about	Level of education			P*
	Low	Medium	High	
	%	%	%	
What is a healthy balanced diet?	46.7	37.5	22.4	<0.01
Preparation and cooking of foods	41.1	31.3	24.7	0.03
Recipe ideas for children	82.9	72.0	70.5	0.08
Overcoming fussy eating	58.4	59.3	59.0	0.95
Introducing new foods	59.5	56.6	44.2	0.06
Food and play	57.5	48.8	50.0	0.36
Understanding food labels	45.1	34.6	19.5	<0.001
Budgeting for food	55.4	40.5	18.2	<0.001
Healthy foods to give your children	57.5	46.9	37.3	0.01
Healthy snacks to give your children	57.3	54.3	39.7	0.03
Appropriate portion sizes for children	59.2	55.0	36.4	<0.01
Ways to encourage children to eat well	68.4	61.3	50.0	0.02
Talking to other parents about children's food	38.9	34.2	34.2	0.56
Centre staff to receive more training about food and nutrition	33.8	34.6	15.1	0.01
Centre staff visiting you at home to advise you on helping your child to eat well	18.1	16.3	9.5	0.14

* χ^2 test for trend (n 261).

cost of food was more important to parents in Cornwall than in Islington ($P=0.04$); this was the only significant geographical difference.

Healthy eating support required

Thirty-eight per cent of parents said they would like more advice to help their child to eat well. The response to this question (yes/no) did not differ significantly between parents with low, medium and high educational attainment. When asked what kind of healthy eating support they would like to help their child to eat well, the following options were the most popular with parents (considered 'very useful' by >50%): recipe ideas for children (75%), practical ways to encourage children to eat well (60%), overcoming fussy eating (59%), introducing new foods (54%), food and play – ways to make food fun (52%),

examples of healthy snacks for children (52%) and appropriate portion sizes for children (50%). The least popular option was home-based support for parents; only 16% of parents thought this would be very useful. Some parents added comments regarding other ways they would like to be supported; these included provision of healthier snacks at the children's centre, cooking and growing activities, healthy options including cultural foods (Islington) and the benefits of healthy eating.

Parents were grouped by level of education to show which options were considered very useful in each group (Table 3). Significantly more of the less educated parents wanted to learn more about: what a 'healthy diet' means ($P<0.01$), how to prepare and cook healthy food ($P=0.03$), how to understand food labels, budgeting for food (both $P<0.001$), examples of healthy food and

snacks for children ($P=0.01$ and 0.03 , respectively), appropriate portion sizes for children ($P<0.01$) and ways to encourage children to eat well ($P=0.02$).

Discussion

The results demonstrate that a wide range of factors influence the food choice of parents in the UK. The most important factors in this sample of parents were healthiness, taste, freshness and quality. Previous studies have shown that a myriad of factors affect how and what parents choose to feed their children, including the cost of food, convenience, limited food skills, social influences (e.g. family, food rules, marketing) and health concerns^(15,19,22,23). A study of low-income mothers of 2-year-old children in Scotland showed that, although mothers' general knowledge about healthy eating was good, several factors were associated with poor diet among children; these included confusion about healthy eating advice, busy lifestyle, meals not eaten as a family and previously rejected foods not being offered⁽²⁴⁾.

Parents' perceptions of the importance of individual factors were associated with their level of education. This concurs with other studies investigating the links between parental education, children's food intakes and the mediating effects of parenting practices⁽²⁵⁾.

Parents were consulted directly about the type of support they would find most useful to help their child to eat well. Almost half of the ideas suggested proved popular with over 50% of parents, illustrating the demand for healthy eating interventions. Although less popular than other options, home-based support may be preferred by some families and this approach has shown some success⁽¹⁰⁾. Similar consultations with parents and stakeholders have been used to develop successful overseas nutrition interventions targeting children^(10,19).

The type of support required was compared by parents' level of education, to facilitate the development of more tailored support. For example, less educated parents were more concerned about the affordability of healthy food and requested support with basic food acquisition skills such as budgeting for food and understanding food labels. A recent study in Germany found that low parental education and low income were associated with poor diet in children aged 2 years⁽²⁶⁾. This supports our findings that less educated parents want more support from a nutrition intervention.

As with most exploratory studies, the limitations of the current study must be acknowledged. First, the scope and length of the questionnaire were limited by acceptable parental completion time. In the complex field of parental food choice, topics and questions not included could have added to the depth of information gathered in the study. Second, the sample is unlikely to be fully representative of children's centre users. Participation was

voluntary and some parents opted out of completing the questionnaires.

The results suggest some sociodemographic differences between children's centre users in rural and urban areas of England. Children's centres in Islington provide day care services and therefore attract more working parents than those in Cornwall. This may account for some of the differences observed, for example in marital status.

Conclusions

The present study demonstrates demand for further interventions supporting parents to improve the diets of young children in one rural and one urban area of England. It provides a valuable insight into the everyday food choices and concerns of parents and the specific kinds of support they feel they need. In particular, the following key points were found.

1. The three most popular ideas for the intervention were recipe ideas for children (75%), practical ways to encourage children to eat well (60%) and overcoming fussy eating (59%).
2. Factors influencing parents' food choice and the type of support required were associated with level of education.
3. There was greater demand for healthy eating interventions from parents with lower levels of education.

Children's centres provide an ideal setting in which to deliver healthy eating support and, although not all parents attend children's centres, there are plenty of parents within their reach who would benefit.

The current exploratory survey was part of an ongoing consultation process to develop an intervention targeting parents and pre-school children. The next stage is to pilot the intervention in children's centres in Cornwall and Islington. That study will generate much needed evidence from the UK on nutrition intervention in early childhood.

Acknowledgements

Source of funding: This work was commissioned by the Food Standards Agency in 2009 (grant number N14011) and supported by the Department of Health (UK) from 2010. *Conflicts of interest:* The authors declare no conflicts of interest. *Authors' contribution:* H.R.O. was responsible for project management and data collection in Cornwall; A.H. was responsible for project management and data collection in Islington; H.P. and H.R.O. were responsible for statistical analyses; R.G.W., G.A.R. and C.P. were responsible for study design; all authors contributed to questionnaire development, interpretation of findings and preparation/revisions of the manuscript. Each author has seen and approved the contents of the submitted manuscript. *Acknowledgements:* The authors

thank all of the parents who gave up their time to complete the questionnaire in Cornwall and Islington, the project steering group and the funding body.

References

- Bates B, Lennox A, Bates C *et al.* (2011) *National Diet and Nutrition Survey: Headline results from Years 1 and 2 (combined) of the Rolling Programme (2008/2009–2009/10)*. London: Food Standards Agency and Department of Health.
- Crawley H (2006) *Eating Well for Under 5s in Child Care. Practical and Nutritional Guidelines*. St Austell: Caroline Walker Trust.
- Klesges RC, Stein RJ, Eck LH *et al.* (1991) Parental influence on food selection in young children and its relationship to childhood obesity. *Am J Clin Nutr* **53**, 859–864.
- Friel S, Kelleher C, Campbell P *et al.* (1999) Evaluation of the Nutrition Education at Primary School (NEAPS) programme. *Public Health Nutr* **2**, 549–555.
- Sacher PM, Chadwick P, Wells JCK *et al.* (2005) Assessing the acceptability and feasibility of the MEND programme in a small group of obese 7–11-year-old children. *J Hum Nutr Diet* **18**, 3–5.
- Moore L, Moore GF, Tapper K *et al.* (2007) Free breakfasts in schools: design and conduct of a cluster randomised controlled trial of the Primary School Free Breakfast Initiative in Wales. *BMC Public Health* **7**, 258.
- National Institute for Health and Clinical Excellence (2008) *Improving the Nutrition of Pregnant and Breastfeeding Mothers and Children in Low-Income Households*. NICE *Public Health Guidance* no. 11. London: NICE.
- Sacher P, Wolman J, Chadwick P *et al.* (2008) Mini-MEND: MEND's early years healthy lifestyle programme for 2–4 year olds and their families. *Nutr Bull* **33**, 364–367.
- Hardy S, Lowe A, Unadkat A *et al.* (2010) Mini-MEND: an obesity prevention initiative in a children's centre. *Community Pract* **83**, 26–29.
- de Silva-Sanigorski AM, Bell AC, Kremer P *et al.* (2010) Reducing obesity in early childhood: results from Romp & Chomp, an Australian community-wide intervention program. *Am J Clin Nutr* **91**, 831–840.
- Haire-Joshu D, Elliott MB, Caito NM *et al.* (2008) High 5 for kids: the impact of a home visiting program on fruit and vegetable intake of parents and their preschool children. *Prev Med* **47**, 77–82.
- Fraser K, Wallis M & St John W (2004) Improving children's problem eating and mealtime behaviours: an evaluative study of a single session parent education programme. *Health Educ J* **63**, 229–241.
- Office for Standards in Education, Department for Education and Skills & Food Standards Agency (2004) *Starting Early: Food and Nutrition Education of Young Children*. Manchester: Ofsted Publications Centre.
- McCaffree J (2003) Childhood eating patterns: the role parents play. *J Am Diet Assoc* **103**, 1587.
- Barker M, Lawrence WT, Skinner TC *et al.* (2008) Constraints on food choices of women in the UK with lower educational attainment. *Public Health Nutr* **11**, 1229–1237.
- Cornwall County Council (not dated) *A Professional Guide to Children's Centres in Cornwall*. Gendall: Cornwall County Council.
- Department for Communities and Local Government (2007) *The English Indices of Deprivation 2007*. London: Department for Communities and Local Government.
- Office for National Statistics (2003) 2001 Census: Census Area Statistics. <http://www.ons.gov.uk/ons/guide-method/census/census-2001/index.html> (accessed July 2010).
- Williden M, Taylor R, McAuley K *et al.* (2006) The APPLE project: an investigation of the barriers and promoters of healthy eating and physical activity in New Zealand children aged 5–12 years. *Health Educ J* **65**, 135–148.
- Clark HR, Goyder E, Bissell P *et al.* (2008) A pilot survey of socio-economic differences in child-feeding behaviours among parents of primary-school children. *Public Health Nutr* **11**, 1030–1036.
- Steptoe A, Pollard TM & Wardle J (1995) Development of a measure of the motives underlying the selection of food – The Food Choice Questionnaire. *Appetite* **25**, 267–284.
- Hampson SE, Martin J, Jorgensen J *et al.* (2009) A social marketing approach to improving the nutrition of low-income women and children: an initial focus group study. *Public Health Nutr* **12**, 1563–1568.
- Alderson TSJ & Ogden J (1999) What do mothers feed their children and why? *Health Educ Res* **14**, 717–727.
- Crombie I, Kiezebrink K, Irvine L *et al.* (2009) What maternal factors influence the diet of 2-year-old children living in deprived areas? A cross-sectional survey. *Public Health Nutr* **12**, 1254–1260.
- Vereecken C, Keukelier E & Maes L (2004) Influence of mother's educational level on food parenting practices and food habits of young children. *Appetite* **43**, 93–103.
- Sausenthaler S, Kompauer I, Mielck A *et al.* (2007) Impact of parental education and income inequality on children's food intake. *Public Health Nutr* **10**, 24–33.