DOI: 10.1111/j.1365-263X.2008.00922.x

Oral health research with children

ZOE MARSHMAN & MELANIE J. HALL

Department of Oral Health and Development, School of Clinical Dentistry, Claremont Crescent, Sheffield, S10 2TA, UK

International Journal of Paediatric Dentistry 2008; 18: 235–242

Background. There has been a shift towards research *with* children and the adoption of the concept of child-centred research. However, the majority of oral health research is conducted *on* children, rather than *with* them.

Objective. This study aimed to provide an overview of contemporary approaches to research *with* children.

Considerations. The methodological considerations of such research include: the power relationship between the adult researcher and the child participant, with important factors of language use, the setting for the research, appropriate analysis, and quality of the data; ethical factors such as the purpose and risks of the research, confidentiality, recruitment, funding, information to children and parents, consent, and dissemination; and appropriate methods. Methods suitable for oral health research *with* children include quantitative techniques such as questionnaires and qualitative approaches including interviews individually or in groups and participatory techniques such as time-lines/life grids, drawings, and vignettes.

Conclusion. There is considerable scope to access children's perspectives of their oral health and care through actively involving them in research. To conduct such research, however, requires training or collaboration with colleagues from other disciplines.

Introduction

Changing position of children in society

Over the past 30 years, the position of children in society has changed with increasing recognition of children's rights and the need to involve them in decisions about their education, and social and health care[1].

These changes have had implications for the involvement of children in research, particularly within the social sciences. Much of the research, up until the 1970s, viewed children as developmentally incomplete adults and gave little time to studying them, tending to conduct research *on* children. Research conducted *on* children involves 'what adults think children think'[2] and assumes the superiority of adult knowledge. However, as more weight has been given to the rights and views of the child, there has been a shift towards research *with* children and the adoption of the concept of child-centred research. Child-centred research has been summarized as: (i) regarding children as competent and reflexive in reporting their own experiences; (ii) giving children a voice and taking seriously what they say; and (iii) rather than researching on children, working for and with them[3].

In oral health research, a recent systematic review found the majority of research (87%) was conducted with children as the 'objects' of research, rather than as active participants throughout the research process[4]. However, articles were identified of good examples of research *with* children. Several studies involved children in the development of child-centred questionnaires[5,6], and one study asked children for their perspectives on dental care to inform redesign of paediatric dentistry services[7]. Involving children in this way is important from both clinical and policy perspectives.

In paediatric dentistry and orthodontics, it is the child who undergoes the treatment and who lives with the consequences. It is therefore important to consider their perspectives, desires, and expectations in decision-making about their care. Although communication with patients is stressed as a key feature of dentistry for children[8], this emphasis does

Correspondence to:
Zoe Marshman, Department of Oral Health and Development, School of Clinical Dentistry, Sheffield S10 2TA, UK. E-mail: z.marshman@sheffield.ac.uk

not appear to be present in research. Further research *with* children, particularly about the effectiveness of clinical interventions from their perspective, could improve the quality of individual patient care.

In terms of policy implications, existing policies, such as the UK Children's National Service Framework suggest professionals should listen to children, and value their views and take these into account in decisions about their care and the planning, delivery, and evaluation of services[9]. In Scotland, the action plan for improving dental services suggests services should be 'child friendly'[10]. Further information from children could be used to advocate for resources to improve the child-centredness of the way dental services are delivered. Equally, research *with* children could contribute to policies, including clinical guidelines, to bring about changes that reflect children's perspectives more accurately.

The aim of this paper was to provide an overview of contemporary approaches adopted when conducting research *with* children. The methodological considerations of such research will be discussed, including the power relationship between the adult researcher and the child participant, ethical factors, and appropriate methods. The paper will conclude with recommendations for future oral health research *with* children.

Methodological considerations of research with children

Background

Bearing in mind the advantages of involving children in research, several methodological factors need to be considered. Indeed, it has been for practical reasons that researchers, in the past, have chosen to rely on adults as proxies for children, rather than asking children directly. For example, most oral-health-related quality-of-life measures for children under 8 years of age are proxy measures[11]. However, only modest agreement is found between parents and children's reports of oral-health-related quality of life[12]. In the UK Children's Dental Health Survey, a questionnaire on the impact of oral health was included for the first time in 2003. Parents alone completed 91% of the questionnaires with the remainder completed by parents with the assistance of their child. The authors stated that parents, as proxies, were used as a measure designed for children had not been evaluated in the UK and because the sample included children of a wide age range (5–15 years), and therefore differing competencies to complete a questionnaire[13]. This approach, however, is not sufficiently inclusive of children's views.

Power imbalance

When research is conducted *with* children, the power imbalance between the researcher and the participants needs to be minimized to reach an understanding of children's own perspectives. Several factors have been considered to reduce this power imbalance, including language use, the setting for the research, analysis, and quality of the data.

Language use. Children's use of language differs from that of adults. Children may experience difficulties in comprehension leading to discrepancies between the children's understanding and the researcher's. The difficulties, however, can be two-way, with researchers also misunderstanding children's language.

Setting. The setting for the research is especially important with children, as it may influence their responses. The expression of children's personality, in terms of their attitudes and behaviour, is often more context dependent than that of adults[14].

Children in oral health research are generally studied in school or clinical settings. Research at school is, on the whole, more cost effective although children's responses to questions may be influenced by the presence of teachers or class-mates. Difficulties with a clinical setting are because of its inherent hierarchy and patient's feelings of anxiety which again may influence children's responses. In research *with* children, the home is often used as a place where children feel most comfortable with the potential for improving the

Table 1. Ethical considerations of research with children.

Purpose of the research
– Will the research findings be of benefit to children?
– Have children and their carers commented on the research?
Risks of the research
– What are the risks or costs such as time, inconvenience, embarrassment, and intrusion on privacy?
Confidentiality
– How will confidentiality be ensured?
Recruitment
– How will participants be selected and are they included or excluded for appropriate reasons?
Funding
– Should research funds be raised only from agencies which avoid activities that can harm children?
Information for children, parents, and other carers
– How will the appropriateness of methods of giving information to participants be assessed?
Consent
– How will the situation where a child refuses to consent but the carer accepts be handled?
– Need to inform children that if they refuse or withdraw from the research, this will not be held against them.
Dissemination
– Sending children short reports of the main findings

richness of the data[15]. In each of these settings, however, complete privacy is often elusive.

Analysis. The analysis and interpretation of data from children can reflect the researcher's, rather than children's, beliefs and concerns[16]. It is important therefore not to impose an 'adultist' view on data gathering and analysis, but to be receptive to children's own interests and concerns. The need to reflect on the influences of both academic and personal preconceptions on the processes of interpretation of data from children has been highlighted[17].

Quality of data. Researchers working with children are often asked if they can 'really believe' children's accounts of their experience[18]. However, regardless of the age of the respondent, there is no evidence that the risk of bias (including acquiescence and social desirability bias) is greater in data from children than adults. It has been suggested that if children are not providing valid and reliable data, it is not the fault of the child, but of the researcher[14].

Methods suggested to assure the quality of data include maintaining confidentiality, developing a rapport between researcher and child, giving the child unambiguous and comprehensive instructions at the start, asking questions relevant to children's own experience, avoiding leading questions, and permitting 'don't know' responses to avoid guesses[19].

Ethical considerations

Ethical concerns inevitably dominate research involving children and young people[19]. Alderson and Morrow outlined the important areas, and these can be summarized as: the purpose and risks of the research, confidentiality, recruitment, funding, information to children and parents, consent, and dissemination (Table 1)[2].

Although some of the power imbalance factors and ethical considerations are also applicable to research with adults, the generation difference between adult researchers and child participants makes addressing these factors particularly pertinent. Appropriate research methods for research *with* children will now be outlined

Contemporary research methods with children

Craig suggests that children are 'more robust, articulated and willing to be heard (given appropriate age-related research design and

sensitive researchers) than many adults assume to be the case'[20]. Methods used in research *with* children include quantitative techniques such as questionnaires, and qualitative approaches including interviews individually or in groups and participatory techniques. Suitable participatory techniques for oral health research include time-lines/life grids, drawings, and vignettes.

Questionnaires and scales. Questionnaires, although completed by children, are often designed by adults so although they are useful to answer certain research questions, they may not capture all aspects relevant to the children and young people themselves. Several oral-health-related quality-of-life measures, however, have been designed with involvement of children in the process, namely the Child Perceptions Questionnaires and the Child Oral Impacts on Daily Performance[5,6,21]. The properties of these measures including reproducibility, internal consistency, construct, and criterion validity have subsequently been evaluated for use in several countries and have been found to be satisfactory[4,6,22]. However, to ensure questionnaires are sufficiently child centred, properties such as acceptability and face and content validity also need to be evaluated. These properties, which should be evaluated qualitatively with groups of participants, concern whether the measures make sense to the participants and cover all areas of importance to them.

An alternative quantitative approach to questionnaires is the use of scales. In health research, different methods of measuring pain in young children have been reported depending on the age of the child. For example, in children under 3 years, parents have been asked to apply behavioural rating scales of their children's facial expressions. In children from 3 to 5 years, six photographs of children's faces indicating the intensity of pain have been shown to children. From 5 years of age, visual analogue scales (VAS), faces scales, and finger span tests (where children use the distance between their thumb and forefinger to indicate the intensity of the pain) have been recommended[23]. A Coloured Analogue Scale, which varies in colour (from light pink to deep red), width (from 1 mm to 3 mm wide), and length (14.5 mm long), has acceptable psychometric properties and has the advantage over a VAS of being more convenient to administer and score, particularly in a clinical setting[24].

Focus groups and interviews. Focus groups and interviews seek information directly from the children and young people in their own words[18,25].

Children are capable interview participants and have participated in research on a variety of aspects of their lives, including illness and health-related experiences[26]. Previous researchers have successfully interviewed children from 6 years of age, and suggested that children as young as 3 years old are capable of being involved in such research[27].

Data are derived by audiotaping the focus groups and interviews, and transcribing them verbatim for analysis. Analysis of qualitative data should result in a detailed description which identifies patterns and develops explanations, and remaining faithful to the data in its original form[28]. Methods differ; for example, some approaches focus on language, whereas others place an emphasis on understanding or the building of theory[29].

In oral health research, interviews and focus groups have been used to explore children's perspectives: oral health generally, dental services, dental health education, habits (drinking soft drinks), and compliance with orthodontic treatment[7,30–33]. Data were analysed using a variety of approaches including content analysis, framework analysis, and constant comparative approach. Most of these studies involved teenagers, although in one study, children from 8 years of age were interviewed[32].

Stewart and colleagues conducted a study with children about their perspectives of food. Previous research had found that although children were knowledgeable about the nutritional value of foods, this did not influence their food choices. The study entailed semi-structured interviews with 6–11 year olds which were analysed using a framework approach. The increased understanding of young people's eating behaviours enabled recommendations to be made about interventions to improve nutrition in young people and the development of nutritional policy[34].

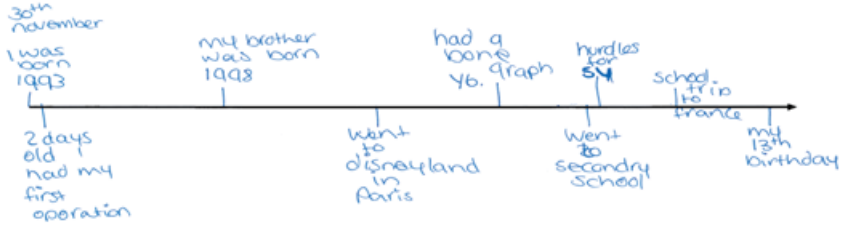

Fig. 1. Time-line illustration of child with cleft lip and palate.

Difficulties may arise with interviews, individually or in groups, if spontaneous conversation is not forthcoming, particularly with young children. Participants might not be willing to discuss the areas that the interviewer holds important. It may be argued, however, that the purpose of research is not to satisfy the researcher's agenda and that there should be scope for the participants to shape the content. In addition, interviews generate a large volume of data, leading to a time-consuming data analysis.

Time-line exercises and life grids. Time-line exercises can be used to chart the important events in participants' lives[35,36]. Edwards and colleagues provided participants with illustrated stickers to represent events such as the birth of a sibling or moving house[36]. School-children may be familiar with time-line exercises, which are used in history lessons and have already been utilized in order to research children's perspectives on age, agency, and memory throughout the life course[35]. Time-lines are currently being used by members of the Children and Young People Research Group of the University of Sheffield to explore children's experiences of the cleft lip and palate care pathway (Fig. 1). There has been a tendency for previous research on cleft lip and palate to take a quantitative approach, without concentrating on children's own perspectives. Participation entailed two interviews, each beginning with a time-line activity. Participants spent a few minutes constructing the time-line, noting key events in their lives, and providing a commentary on them as they went along or upon completion of the exercise. The commentary was audiotaped and transcribed verbatim. The purpose of the time-lines was twofold. Firstly, the time-lines prompted a discussion about participants' lives, giving them the choice over whether they referred to treatment and to do so in their own words. Secondly, the inclusion of past, current, or future treatment, and their subsequent discussion, provided an indication of their significance. In terms of analysis, because the time-lines were designed to elicit a narrative, the primary focus was on interpreting that data. Time-lines, however, may be utilized as data in their own right.

The time-line in Fig. 1 describes the life history of a 13-year-old girl with cleft lip and palate; it illustrates the significance to this young person of her cleft lip repair at 2 days and her alveolar bone graft at 10 years among other life events including holidays to Disneyland and representing her county at sports.

Life grids can also be used to a similar effect, as demonstrated by Wilson and colleagues in their study of young people's accounts of parental substance use. Their life grids consisted of a time-line across the top of a landscape A3 sheet of paper, and underneath the time-line were six rows denoting different aspects of participants' lives, including school, home, and interests. Participants then used the life grid to indicate what was happening in their lives with regard to various aspects, at particular points in their lives. As with time-lines, life grids provided a means to obtain young people's narratives, and it was the narratives that were analysed[37].

Drawings. Drawings are a useful component of research *with* children for several reasons: (i) they can be used with children of all ages, including very young children; (ii) drawing may be considered a familiar, ordinary activity which children may have experience of undertaking at home or school; (iii) they provide a non-verbal means of communication, which may be accompanied by a verbal

Fig. 2. A child's drawing of their face.

discussion; (iv) they can be adapted as children wish; and (v) drawings do not necessitate an immediate response; children may take time and deliberate over them[38].

Drawings have been employed to explore issues relating to health[39,40], although relatively little has been published in oral health research. A study in the USA asked children to draw a picture of a dentist at work. These pictures were analysed quantitatively based on the occurrence of items. Common items were a dental chair (87.5% of drawings), the dentist (84.7%), and a patient in the chair (77.8%)[41]. The analysis, however, did not result in recommendations on how dental services to children could be improved.

Research currently being conducted in Sheffield involves children keeping diaries of their transition to secondary education. Drawings were included as part of the diaries; Edward, aged 11 years, drew this picture of himself including his buccally placed upper right canine (Fig. 2). He described his feelings towards this tooth and how he joked about it to help make friends at his new school. I don't mind my stickey out tooth. I sometimes joke with my friends saying I am a half vampire.

The findings of this study will provide a valuable insight into the impact of children's oral health during this important life event.

Limitations of this method include children lacking confidence in their drawing skills, the subjectivity of interpretation by adults, and difficulties with analysis.

Vignettes. Vignettes complement other research methods and are particularly beneficial where the subject matter is sensitive because they may be considered less searching and threatening. Vignettes may present stories for participants to comment on in order to facilitate discussion and give respondents control over when to divulge personal experiences. Vignettes can elicit information that other methods may not and complement data derived from other methods. They have been used to investigate children's perceptions of living arrangements following divorce[42] and sibling relationships[36] with children and young people aged 5–16 years. In some instances, vignettes have been used to ask children what they think a hypothetical person should do[42]. Woodgate's interviews with young people living with chronic illness incorporated the question, 'Imagine your best friend was just diagnosed with (name of disease). What would you say to them?', and the interviewees responded with advice for other chronically ill adolescents[43].

In oral health research, vignettes have been used as part of an interview to gain children's recommendations on how dental care can be improved[4]. This approach resulted in the emergence of unanticipated ideas including the inappropriateness of materials in the waiting room, difficulties some children found in asking the dentist questions, and their preference for being given treatment options to choose from.

There are limitations to the capabilities of vignettes. There is a void between a vignette and reality, in terms of people's actual behaviour and hypothetical actions. They may generate 'socially acceptable' data rather than authentic responses.

Recommendations

In a review of methods for conducting research *with* children, Punch concluded that both traditional and innovative methods can be used to overcome some of the perceived barrier to research *with* children. This multiple method approach has benefits including: (i) the potential to hold the attention of participants, preventing boredom and maintaining interest; (ii) minimization of bias that could arise where research findings are centred around data derived from one technique; (iii) the capacity for triangulation and cross-checking of data; and (iv) combine traditional methods with innovative methods, thus satisfying variations between individuals' preferences and competencies.

However, there is the potential for such methods to patronize children and for them to be selected for their innovation and 'novelty' value, rather than because they will generate appropriate data. Punch concluded that the choice of method for a study should depend on the aim of the study, the experience and preference of the participants, and the competencies of the researcher[19].

It should be acknowledged that not all research in paediatric dentistry lends itself to child-centred approaches; however, there is considerable scope to access children's perspectives of their oral health and care. Actively involving children in research is critical to this endeavour. To conduct research *with* children, however, requires the acquisition of skills either through training or collaboration with colleagues from other disciplines.

What this paper adds
- An overview of contemporary approaches to research *with* children.
- A description of the methodological considerations when researching *with* children.
- An outline of appropriate methods for oral health research *with* children.

Why this paper is important to paediatric dentists
- This paper provides paediatric dentists with important information on how their research can be more child centred.

Acknowledgement

We would like to acknowledge the support received from the Children and Young People Oral Health Research Group of the University of Sheffield.

References

1 James A, Jenks C, Prout A. *Theorizing Childhood*. Oxford: Polity, 1998.
2 Alderson P, Morrow V. *Ethics, Social Research and Consulting with Children and Young People*. Ilford: Barnardo's, 2004.
3 Mayall B. *Children, Health and Social Order*. Buckingham: Open University Press, 1996.
4 Marshman Z, Rodd H, Stern M, *et al.* An evaluation of the Child Perceptions Questionnaire in the UK. *Community Dent Health* 2005; **22**: 151–155.
5 Jokovic A, Locker D, Stephens M, Kenny D, Tompson B, Guyatt GH. Validity and reliability of a questionnaire to measure child oral health-related quality of life. *J Dent Res* 2002; **81**: 459–463.
6 Gherunpong S, Tsakos G, Sheiham A. Developing and evaluating an oral health-related quality of life index for children; The CHILD-OIDP. *Community Dent Health* 2004; **21**: 161–169.
7 Fitzgerald RP, Thomson WM, Schafer CT, Loose MA. An exploratory qualitative study of Otago adolescents' views of oral health and oral health care. *N Z Dent J* 2004; **100**: 62–71.
8 Blinkhorn AS. Introduction to the dental surgery. In: Welbury RR, Duggal MS, Hosey M-T (eds). *Paediatric Dentistry*, 3rd edn. Oxford: Oxford University Press, 2005: 19–37.
9 Department of Health. *National Service Framework for Children, Young People and Maternity Services*. London: Department of Health, 2003.
10 Scottish Executive. *Improving Oral Health and Modernising NHS Dental Services in Scotland*. Edinburgh: Scottish Executive, 2005.
11 Anderson HK, Drummond BK, Thomson WM. Changes in aspects of children's oral-health-related quality of life following dental treatment under general anaesthesia. *Int J Paediatr Dent* 2004; **14**: 317–325.
12 Jokovic A, Locker D, Guyatt G. How well do parents know their children? Implications for proxy reporting of child health-related quality of life. *Qual Life Res* 2004; **13**: 1297–1307.
13 Nuttall N, Harker R. *Impact of Oral Health*. London: Office of National Statistics, 2004.
14 Scott J. Children as respondents. In: Christensen P, James A (eds). *Research with Children*. London: RoutledgeFalmer, 2000: 98–119.
15 Faux SA, Walsh M, Deatrick JA. Intensive interviewing with children and adolescents. *West J Nurs Res* 1988; **10**: 180–194.
16 Woodhead M, Faulkner D. Subjects, objects or participants. In: Christensen P, James A (eds). *Research with Children*. London: RoutledgeFalmer, 2000: 9–35.
17 Davis J, Watson N, Cunningham-Burley S. Learning the lives of disabled children. In: Christensen P,

James A (eds). *Research with Children*. London: RoutledgeFalmer, 2000: 201–224.
18 Morrow V. 'It's cool, … 'cos you can't give us detentions and things, can you?!': reflections on researching children. In: Milner P, Carolin B (eds). *Time to Listen to Children*. London: Routledge, 1999: 203–216.
19 Punch S. Research with children. The same or different from research with adults? *Childhood* 2002; **9**: 321–341.
20 Craig G. Children's participation through community development: assessing the lessons through international experience. In: Hallett C, Prout A (eds). *Hearing the Voices of Children: Social Policy for a New Century*. London: RoutledgeFalmer, 2003: 38–57.
21 Jokovic A, Locker D, Tompson B, Guyatt G. Questionnaire for measuring oral health-related quality of life in eight- to ten-year-old children. *Pediatr Dent* 2004; **26**: 512–518.
22 Foster Page LA, Thomson WM, Jokovic A, Locker D. Validation of the Child Perceptions Questionnaire (CPQ 11–14). *J Dent Res* 2005; **84**: 649–652.
23 Gaffney A, McGrath PJ, Dick B. Measuring pain in children: developmental and instrument issues. In: Schechter NL, Berde CB, Yaster M (eds). *Pain in Infants, Children, and Adolescents*. Philadelphia, PA: Lippincott Williams & Wilkins, 2003: 128–141.
24 McGrath PA, Seifert CE, Speechley KH, Booth JC, Stitt L, Gibson MC. A new analogue scale for assessing children's pain: an initial validation study. *Pain* 1996; **64**: 435–443.
25 Alderson P. *Listening to Children: Children, Ethics Social Research*. Ilford: Barnardos, 1995.
26 Alderson P. Consent to children's surgery and intensive medical treatment. *J Law Soc* 1990; **17**: 52–65.
27 Docherty S, Sandelowski M. Interviewing children. *Res Nurs Health* 1999; **22**: 177–185.
28 Sandelowski M. Sample size in qualitative research. *Res Nurs Health* 1995; **18**: 179–183.
29 Tesch R. *Qualitative Research: Analysis Types and Software Tools*. Basingstoke: Falmer Press, 1990.
30 Ostberg A-L. On self-perceived oral health in Swedish adolescents. *Swed Dent J Suppl* 2002; **155**: 1–87.
31 Bennett ME, Tulloch JF, Vig KW, Phillips CL. Measuring orthodontic treatment satisfaction: questionnaire development and preliminary validation. *J Public Health Dent* 2001; **61**: 155–160.
32 May J, Waterhouse PJ. Dental erosion and soft drinks: a qualitative assessment of knowledge, attitude and behaviour using focus groups of school children: a preliminary study. *Int J Paediatr Dent* 2003; **13**: 425–434.
33 Beaune L, Forrest CR, Keith T. Adolescents' perspectives on living and growing up with Treacher Collins syndrome: a qualitative study. *Cleft Palate Craniofac J* 2003; **41**: 343–350.
34 Stewart K, Gill P, Treasure E, Chadwick B. Understanding about food among 6–11 years olds in South Wales. *Food Cult Soc* 2006; **9**: 318–336.
35 James A. Life times: children's perspectives on age, agency and memory across the life course. In: Qvortrup J (ed.). *Studies in Modern Childhood: Society, Agency and Culture*. London: Palgrave, 2005: 248–266.
36 Edwards R, Hadfield L, Mauthner M. *Resources for Investigating Children's Experiences and Perspectives, Sibling Relationships in Middle Childhood: Children's Views – a JRF Project*. [WWW document.] URL http://www.lsbu.ac.uk/families/jrfsibresources.shtml. 18thSeptember2007 (accessed: 28 January 2008).
37 Wilson S, Cunningham-Burley S, Bancroft A, Backett-Milburn K, Masters H. Young people, biographical narratives and the life grid: young people's accounts of parental substance use. *Qual Res* 2007; **7**: 135–151.
38 Christensen P, James A. *Research with Children Perspectives and Practice*. London: RoutledgeFalmer, 2000.
39 Oakley A, Bendelow G, Barnes J, Buchanan M, Nasseem Husain OA. Health and cancer prevention: knowledge and beliefs of children and young people. *Br Med J* 1995; **310**: 1029–1033.
40 Williams T, Wetton N, Moon A. *A Picture of Health: What Do You Do That Makes You Healthy and Keeps You Healthy?* London: Health Education Authority, 1989.
41 Taylor D, Roth G, Mayberry W. Children's drawings about dentistry. *Community Dent Oral Epidemiol* 1976; **4**: 1–6.
42 Barter C, Renold E. I wanna tell you a story: the application of vignettes in qualitative research with young people. *Soc Res Methodol Theory Prac* 2000; **3**: 307–323.
43 Woodgate RL. Adolescents' perspectives of chronic illness: 'it's hard'. *J Pediatr Nurs* 1998; **13**: 210–223.