Appendices

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A systematic review of interactive multimedia interventions to promote children's communication with health professionals: implications for communicating with overweight children

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Abstract

Background: Interactive multimedia is an emerging technology that is being used to facilitate interactions between patients and health professionals. The purpose of this review was to identify and evaluate the impact of multimedia interventions (MIs), delivered in the context of paediatric healthcare, in order to inform the development of a MI to promote the communication of dietetic messages with overweight preadolescent children. Of particular interest were the effects of these MIs on child engagement and participation in treatment, and the subsequent effect on health-related treatment outcomes.

Methods: An extensive search of 12 bibliographic databases was conducted in April 2012. Studies were included if: one or more child-participant was 7 to 11-years-of-age; a MI was used to improve health-related behaviour; child-participants were diagnosed with a health condition and were receiving treatment for that condition at the time of the study. Data describing study characteristics and intervention effects on communication, satisfaction, knowledge acquisition, changes in self-efficacy, healthcare utilisation, and health outcomes were extracted and summarised using qualitative and quantitative methods.

Results: A total of 14 controlled trials, published between 1997 and 2006 met the selection criteria. Several MIs had the capacity to facilitate engagement between the child and a clinician, but only one sought to utilise the MI to improve communication between the child and health professional. In spite of concerns over the quality of some studies and small study populations, MIs were found useful in educating children about their health, and they demonstrated potential to improve children's health-related self-efficacy, which could make them more able partners in face-to-face communications with health professionals.

Conclusions: The findings of this review suggest that MIs have the capacity to support preadolescent child-clinician communication, but further research in this field is needed. Particular attention should be given to designing appropriate MIs that are clinically relevant.

Keywords: Children, Preadolescent, Multimedia intervention, Clinicians, Health professionals, Communication, Face-to-face, Treatment, Diet, Overweight

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Background

Involvement of children in their healthcare decisions is a legal requirement [1]. An important component of effective communication about treatment choices is the provision of information that enables shared decision-making [2]. Information must be conveyed in a way that is clear and engaging, supporting both the health professional and enabling the child, and their family, to become competent partners in the consultation [3,4].

Presentation of information must suit the child's existing knowledge and what they are able to understand [5]. Historically, health professionals have used leaflets [6-8], as well as diagrams and three-dimensional visual aids [9]. Technology-based resources are also being explored. However, simply making information available does not necessarily make it accessible. Unfortunately, children do not always understand aspects of their treatment and have raised concerns over the way information is conveyed by health professionals in clinical settings [10].

Information contained in traditional resources can be reorganised within interactive multimedia in a variety of non-linear and interesting formats conducive to introducing a topic of conversation, or providing more detailed explanations. This might prove particularly useful to the health professional delivering information on a sensitive and complex topic, such as dietary and behaviour change discussions during child weight management consultations. For many young children, the concept of energy balance and aspects of dietary management are beyond their cognitive capacity [11]. For their part, health professionals can misunderstand the child's priorities and therefore fail to frame information in a meaningful way [12]. Parental influence may also contribute to the tendency for preadolescent children to be marginalised during diet-related appointments [12,13]. While parental involvement is integral to successful paediatric weight management outcomes [14,15], a number of preadolescent children would like a greater degree of involvement in decisions affecting their food choices [16,17]. Greater child participation may be entirely feasible from about seven-years-of-age, when children are cognitively more able to engage in conversations, particularly where there is structure and a concrete basis for discussion [18]. A communication tool, such as interactive multimedia could act as scaffolding to facilitate these more complex and sensitive child-clinician conversations.

This review was undertaken to inform the development of a multimedia intervention (MI) to communicate within the context of weight management consultations with preadolescent children. The target age range for the proposed MI and the systematic review was 7 to 11-years. This review aimed to evaluate the impact of MIs, delivering health information to children in a clinical context, on the quality of child-clinician communication. Although diet-related communication was of particular interest, communication about all health conditions were considered. A secondary objective was to evaluate the effectiveness of MIs in improving satisfaction and indicators of self-management including knowledge, self-efficacy, healthcare utilisation, behaviour change and health outcomes.

Methods

Inclusion criteria

This systematic review included papers that evaluated the effectiveness of MIs used in a clinical context to provide information about a health condition and/or treatment. For the purpose of this review, MIs refer to computer-based educational multimedia programmes using images, animation and sound to engage the user [19]. Papers were considered if at least one child-participant was between 7 and 11-years-old at commencement of the study. Child-participants were required to have a medical diagnosis (such as overweight, asthma, diabetes, cystic fibrosis or cancer). Studies where child-patients were recruited from active clinical treatment lists were included (in order to increase the likelihood of face-to-face child-clinician communication at the time of the study), while those identified through discharge records or schools, and not explicitly in receipt of on-going treatment or monitoring of the medical condition in question at the time of the study, were excluded. Only studies with both an intervention and a comparison group were retained; these included clinical trials, randomised controlled trials, and prospective studies.

There was no restriction on the setting within which the intervention was delivered. Interventions that took place within the community, at a healthcare setting (general practitioner (GP) surgery, community clinic or hospital), at a school or in the child's home were all eligible.

Studies had to report one or more of the following primary or secondary outcome measures to be included in the review. Of primary concern was the effect of the multimedia technology, if any, on the quantity and quality of face-to-face communication between health professional and child, and level of child-engagement in treatment. Attrition rates (appointment non-attendance and dropout rates) were therefore analysed. Stakeholders' satisfaction and views of the intervention were also considered. Other secondary outcomes were measures of health change. They included a wide range of possible treatment outcomes: knowledge acquisition, changes in self-efficacy, attitude to health or motivation to make the desired health change, changes in health outcomes or symptoms, and a reduction in emergency appointments or hospitalisation.

Search strategy

The literature search to identify studies for inclusion was conducted during the third week of April 2012. The search strategy was designed to capture published research, grey literature and on-going or recently-completed clinical trials.

Several papers [20-22] discussing interactive health communication interventions were used to generate an initial list of thesaurus and text word search terms that was then tailored to the scope of the systematic review. The search approach combined terms relating to four search sets: health communication; multimedia or interactive technology; paediatrics; and diet, health behaviour change or education. To begin with, search terms were developed in MEDLINE (Table 1), as it offered a comprehensive thesaurus. The search strategy was then tailored to each database by adapting search syntax and terms, and identifying appropriate field codes. An extensive list of free text words with wild-card truncations supplemented the subject headings to further enhance the sensitivity of the search strategy. A validated methodology filter [23], designed to capture clinical trials, randomised controlled trials and prospective studies was added as a fourth search set. Several databases (OpenGrey, the International Standard Randomised Controlled Trial Number (ISRCTN) Register and the National Research Register (NNR) Archive) did not allow for a sophisticated set-based search strategy. Line-by-line searching was necessary in these cases.

The final searches were run on all 12 databases. Two of these (SciVerse SCOPUS and Reuters Web of Knowledge) yielded more than 500 papers each. In both cases, research categories on the search results page were used to further limit the searches. Tick boxes to exclude research areas deemed unrelated to the scope of the review (such as engineering, chemical engineering and mathematics), were selected. As a relatively new field of research, studies dating from before 1990 were not considered. No language filter was applied.

Having identified potentially relevant papers through database searches, the search results were collated and duplicates removed. The search strategy involved a further four stages. At each stage, citations were evaluated against an exclusion hierarchy that is listed in Table 2. Where a definitive decision could not be made, the citation was retained and carried through to the next stage of the search process. The two review authors (CG and HW) checked the final stage of the search strategy for accuracy.

Data extraction

Data from the included studies were extracted by the main review author, and synthesised into a database developed for the review. An overall lack of robust studies and heterogeneity precluded the amalgamation of data into a meta-analysis. Data were therefore summarised qualitatively and checked by the two review authors.

Quality appraisal

The quality of the studies was determined by applying the risk of bias assessment outlined by Higgins and Altman [54]. Due to the behavioural nature of the studies and the type of interventions under investigation, it would have been virtually impossible for the researchers to eradicate all potential investigator bias in gathering their data. Strategies to limit such bias–blinding or masking–are important considerations even for behavioural studies, and are recommended in the CONSORT Statement [55], p.11. However, in recognition of the inherent difficulty facing researchers in this area, data pertaining to other study quality features were also analysed.

The design and development of the MI is inextricably linked to the success of the intervention as a whole. Tools exist to evaluate internet-based interventions [56,57], and e-learning resources [58,59]. Some are specifically directed at children's computer games [60] and child e-learning applications [61]. These guidelines recommend the assessment of a number of attributes, including: screen appearance (such as colour, design, and content); interactivity; appeal; motivation; engagement; as well as the pedagogical appropriateness of these elements. Nevertheless, such tools could not be applied to the MIs in this review, largely because so few of the MIs were available for this type of evaluation. Four quality features that could be applied to the included MIs, were extracted from a variety of sources. The relevant features were; the evidence-basis and/or theoretical underpinning of the MI design [57,62], MI piloting or testing prior to study commencement [63], ensuring that the MI matched the developmental age of the children recruited to the study [57,62,64], and the time study participants had (during the research period) to explore and familiarise themselves with the content of the MI. Table 3 expands on each quality and defines the scoring criteria.

Results

Studies retrieved

The database search produced 2409 citations. After removing duplicates for published papers, 1536 titles and abstracts were screened for relevance. Main reasons for exclusion were:

- Age–participants fell beyond the target 7 to 11-year age group (such as studies with exclusively pre-school, adolescent or adult subjects);
- No diagnosed health condition;
- Participants not recruited from active clinical treatment lists;
- No comparison or control group.

Table 1 Ovid MEDLINE(R) 1946 to April Week 3 2012 search strategy

1. (appointment$ OR consultation$).tw,kf	49. exp Attitude to Health.sh *(includes Health Knowledge, Attitudes, Practice/, Patient Acceptance of Health Care/)*
2. Health Communication.sh	50. Self Efficacy.sh
3. (health ADJ3 communicat$).tw,kf	51. (self ADJ efficacy).tw,kf
4. OR/ 1-3	52. (health ADJ competence).tw,kf
5. (e-communicat$ OR ecommunicat$).tw,kf	53. Health Behavior.sh
6. (e-health OR ehealth).tw,kf	54. ((health ADJ behavi*r$) OR (chang$ ADJ3 behavi*r$) OR (behavi*r$ ADJ3 change$)).tw,kf
7. electronic$.tw,kf	55. exp Self Care.sh *(includes Blood Glucose Self-Monitoring/, Self Administration/ and Self Medication/)*
8. virtual.tw,kf	56. (self ADJ manag$).tw,kf
9. Virtual Reality.sh	57. exp Patient Satisfaction.sh *(includes Patient Preference/)*
10. (virtual ADJ reality).tw,kf	58. OR/ 39-57
11. (Hypermedia OR Multimedia).sh,tw,kf	59. Randomized Controlled Trial.sh
12. animation.tw,kf	60. Randomized Controlled Trials as Topic.sh
13. ((information ADJ technolog$) OR IT).tw,kf	61. (randomized controlled trial).pt
14. (Decision Making, Computer-Assisted OR Therapy, Computer-Assisted).sh	62. (controlled clinical trial).pt
15. (computer ADJ (assisted OR based OR mediated)).tw,kf	63. Random Allocation.sh
16. (Computers OR Computers, Handheld).sh	64. Double-blind Method.sh
17. (computer$ OR (hand ADJ held ADJ3 computer$) OR (handheld ADJ3 computer$)).tw,kf	65. Single-blind Method.sh
18. (mobile ADJ communic$).tw,kf	66. OR/ 59-65
19. ((personal ADJ digital ADJ assistant) OR pda$ OR (pocket ADJ pc) OR (pocket ADJ computer$)).tw,kf	67. Animals.sh NOT Humans.sh
20. ipad$.tw,kf	68. 66 NOT 67
21. Internet.sh,tw,kf	69. (clinical trial).pt
22. World Wide Web.sh	70. exp Clinical Trial.sh *(includes Clinical Trial, Phase I/, Clinical Trial, Phase II/, Clinical Trial, Phase III/, Clinical Trial, Phase IV/, Controlled Clinical Trial/, Multicenter Study/ and Randomized Controlled Trial/)*
23. ((world ADJ wide ADJ web) OR www OR website$ OR (web-site$) OR (web ADJ based) OR (web-based) OR webbased).tw,kf	71. Case-Control Studies.sh
24. Online Systems.sh	72. (clin$ ADJ25 trial$).tw,kf
25. (online OR on-line OR portal).tw,kf	73. ((single OR double OR triple OR treble) ADJ25 mask$).tw,kf
26. Compact Disks.sh OR CD-I.sh OR CD-ROM.sh	74. Placebos.sh
27. ((cd ADJ rom$) OR cd-rom$ OR cdrom$).tw,kf	75. (placebo$ OR random$).tw,kf
28. Software.sh,tw,kf	76. Research Design.sh
29. (interactive ADJ3 (technolog$ OR application$ OR program$) OR ITA).tw,kf	77. OR/ 69-76
30. Video Games.sh	78. 77 NOT 67
31. ((video OR computer) ADJ game$).tw,kf	79. 78 NOT 68
32. (wii OR nintendo).tw,kf	80. (Comparative Study OR Evaluation Studies OR Follow-Up Studies OR Prospective Studies).sh
33. OR/ 5-32	81. (control$ OR prospectiv$ OR volunteer$).tw,kf
34. Pediatrics.sh	82. intervention$.tw,kf
35. (p*ediatric OR p*ediatrics).tw,kf	83. OR/ 80-82
36. Child.sh,tw,kf	84. 83 NOT 67
37. (children OR childhood).tw,kf	85. 84 NOT (68 OR 79)

Table 1 Ovid MEDLINE(R) 1946 to April Week 3 2012 search strategy *(Continued)*

38. OR/ 34-37	86. 68 OR 79 OR 85
39. (Diet OR Diet Therapy OR Nutrition Therapy).sh	87. 4 AND 33 AND 38 AND 58 AND 86
40. (diet$ OR nutrition$).tw,kf	88. limit 87 to yr=1990-2012
41. (Health Education OR Patient Education as Topic).sh	89. exp Schools.sh *(includes Schools Medical/, Schools Nursery/ and Universities/)*
42. (health ADJ education).tw,kf	90. Vocational Education.sh
43. Health Promotion.sh	91. 88 NOT (89 OR 90)
44. ((health ADJ promotion) OR (promot$ ADJ health)).tw,kf	
45. Patient Participation.sh	
46. exp Patient Compliance.sh *(includes Medication Adherence/)*	
47. Motivation.sh	
48. motivat$.tw,kf	

Figure 1 details the five stages used to identify the citations for this review. Of the 16 papers selected, 5 [6,8,9,65,66] came from stages 1 and 2, 6 [7,67-71] were identified at stage 3 and a further 5 [72-74] (2 of which [75,76] document all or part of a study already added at stage 3) were found in stage 4. In other words, approximately one third of papers were found through database searches; the remaining papers emerged through reference lists and as citing papers.

Study characteristics

All of the 14 included studies were randomised controlled trials, with the exception of one [73] that was non-randomised. Most of the studies were from the United States, with only three from Europe; two originated from the United Kingdom [6,8] and one from Germany [73]. Ethnic groupings of study participants were poorly reported in five papers [6,9,70,73,74]. Of the eight studies that provided a breakdown of the ethnic origin of participants, most children were classed as white [7,8,71] or 'Caucasian' [69,72].

None of the studies aimed to recruit overweight or obese children, but three studies featured health conditions with a dietary element; type 1 diabetes [70], cystic fibrosis [74], and encopresis [71]. In each of these, dietary information was a component of the communicated message but not reported as a specific health outcome. Asthma was the focus of six studies [7,8,66-68,73], with one paper investigating both asthma and sickle cell disease [65]. Other conditions included; non-malignant recurrent headache [72], leukemia (in remission) [69], nocturnal enuresis [6], and dental malocclusion [9]. The study characteristics, summarised in Table 4, reflect the diversity of the studies themselves.

Table 2 Exclusion hierarchy[1] for elimination of full text papers at stage 5 of the search process

Exclusion criteria	No. of studies	and references
No children 7–11 years	0	[2]
No educational multimedia	3	[24-26]
Not recruited from active clinical treatment lists	11	[27-37]
Participants have no diagnosed health condition	2	[38,39]
No comparison group	8	[40-47]
Descriptive paper, not an intervention study	5	[48-52]
Abstract/summary article	1	[53]

[1]used throughout the search strategy.
[2]papers not including participants from the specified age range were systematically excluded through stages 1–4.

Risk of bias

The risk of bias in a number of the included studies was either 'unclear' or 'high risk'. Three exceptions to this generalisation were Connelly, *et al.* [72], Davis, *et al.* [74] and Mcpherson, *et al.* [8] that presented a comparatively low risk of bias. Figure 2 shows the relatively high risk of attrition bias, reporting bias, and 'other bias'.

Sequence generation proved inadequate in several studies; one used children's medical record numbers [7], two others randomised according to period of hospital admission [65] and clinic allocation [6], and one allowed children (and parents) to self-select either the intervention or comparison group [73]. As would be expected, studies that demonstrated a potential risk of bias in ensuring random sequence generation, posed a similar risk of lack of allocation concealment [6,9,65,73].

In addition to the relative risk of bias in how study subjects were assigned to either the comparison or intervention group, some studies [7,9,67] lacked rigour, and balance in their data reporting and discussion. One paper made unfounded deductions about findings, concluding that children in the intervention group

> *"experienced significantly improved communication with parents about diabetes"* [70], p. 87

Table 3 Study quality coding criteria

Category	Quality item	Scoring criteria
MI development	Evidence-basis and theoretical underpinning of intervention design	Was the multimedia intervention (MI) developed according to cited evidence-based guidelines related to the health condition? And/or was mention made of theoretical constructs used in the development of the MI?
		• If either or both of these aspects were mentioned, the quality is coded as *YES*, otherwise it is coded as *NO*
		• *PARTIAL YES* (½) is given to interventions that only invite health professionals to be involved in the design and/or development, i.e. no reference to clinical guidelines or theoretical underpinning
	Intervention piloting/ testing prior to study commencement	Was the MI piloted during or after the development phase with children of the appropriate age range? Was the MI developed for children of a specified age range, and was it then piloted with this age group prior to undertaking the study?
		• The quality is coded as *YES* if piloting, or iterative child-involvement, has been integral to the MI design and/or development or post-development piloting has taken place that may have led to amendments
		• Where piloting or testing has been mentioned, without details about the rigour of the process (such as the ages of the children, the number of children involved, the outcome of the piloting process, etc.), the quality is coded as *PARTIAL YES* (½)
		• The quality is coded as *NO* if no mention is made of child-involvement during development, piloting or testing
Study design	Appropriately selected age ranges for potential research participants	Did the study include children of an appropriate age range? If the MI was piloted or developed in conjunction with children, are study subjects of a similar age range? Could the MI design be developmentally appropriate for the youngest and the oldest study subjects? In other words, is the age range appropriate or is it too large?
		• The quality is coded as *YES* where the MI has been piloted or tested with children of a similar age to those recruited as study subjects, and the age range is ≤ 7-years
		• *YES* is also given to MIs catering for a wider range of ages, e.g. by way of different levels or difficulties, designed cope with the discrepancies in developmental ability of the children, and study data have been analysed and presented within narrower age ranges
		• *PARTIAL YES* (½) is given to studies where the age range is 7 to 8-years, and the above conditions have not been met
		• The quality is coded as *NO* if piloting of the MI took place with a different age group of children to those recruited to the study, without valid reason or explanation, or the age range of study participants was > 8-years with no stated strategy to deal with differences in developmental abilities
Data collection	Amount of time children viewed the multimedia intervention	How much time did children have to familiarise themselves with the content of the MI? Was the number of sessions reported? Was the length of these sessions stated?
		• In order to be coded as *YES*, the paper must indicate (even if a calculated estimate) the amount of time children spent using the intervention. This may be stated as a total time, or length of time for each session
		• A *PARTIAL YES* (½) is given if the total number of sessions is stated, with no indication of time spent viewing the MI
		• The quality is coded as *NO* if no data, data is unclear, or only partial data is provided (e.g. the length of the first session but not subsequent sessions)

without acknowledging that the measure for this outcome data was biased. Another [73] failed to adequately explain why 45% (n = 66) participants in the intervention group did not use the multimedia tool. This study also deviated from the original protocol, transferring children allocated to the intervention group to the comparison group.

The 'other bias' varies from a potential conflict of interest [73]; to lack of clarity on study protocol such as the number of the different leaflets distributed to comparison group participants [6]; possible treatment bias, with intervention group children having more appointments [67]; the time of year children were recruited to the intervention and comparison groups and whether there was any seasonal effect on the chronic health conditions under investigation [65]. One study [7] published some of the results in a second paper [75] using different age groups and slightly altered descriptors of user satisfaction questions.

At their outset, most of the included studies were small [8,65,69-72,74] and could more accurately by

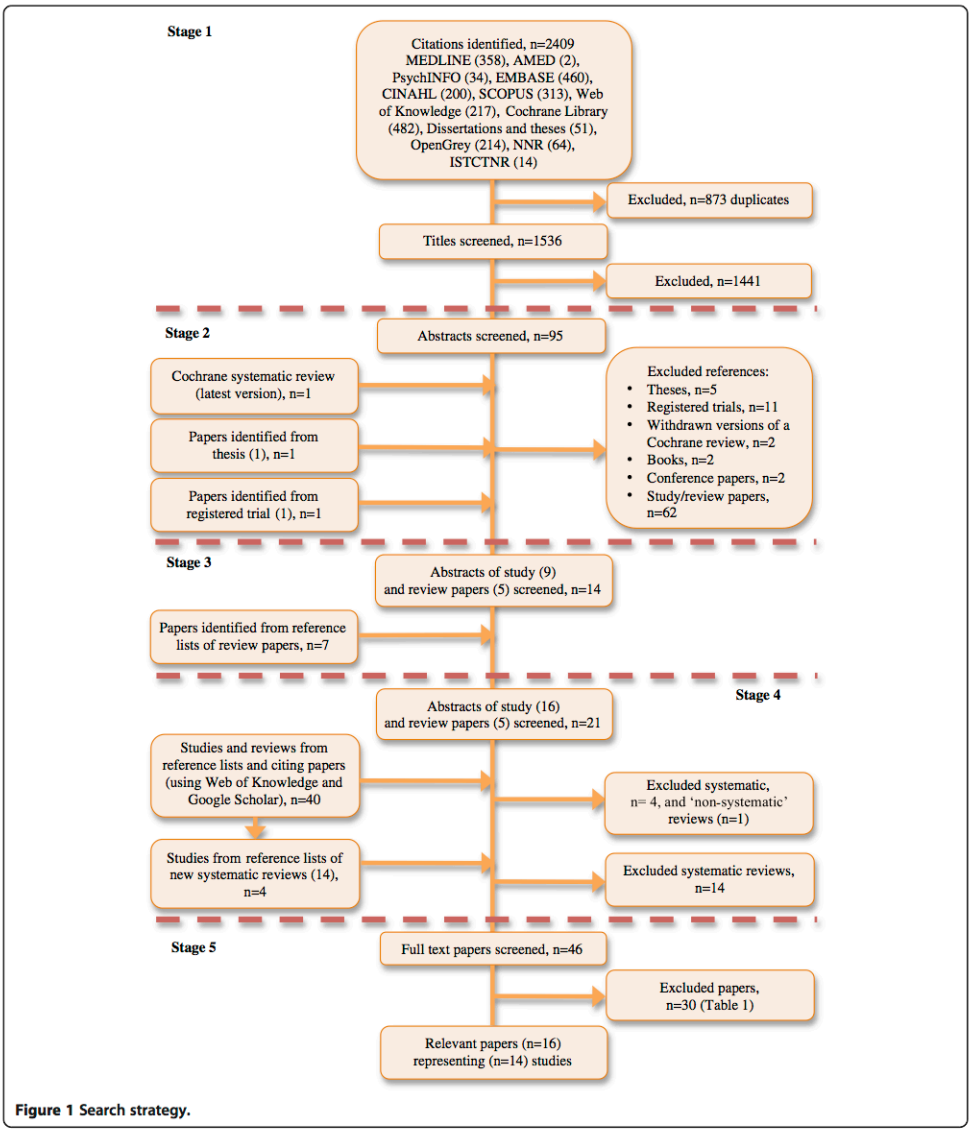

Figure 1 Search strategy.

described as feasibility studies. Two studies reported a sample size calculation. In the first of these, Krishna, *et al.* [7] had a 22% completion rate which translated into one quarter of the calculated desired number of children completing the 12-month study. The second, a study by Redsell, *et al.* [6], had better retention figures (92% of the intervention and 87% of the comparison group) at discharge (not stated, but estimated to be at approximately 6-months). At the 6-month post-discharge follow-up however, data for only 24% and 31% of the intervention and comparison group, respectively, were available.

Table 4 Study characteristics

Criterion	Category	No. of studies	And references
Country	United States	11	[7,9,65-72,74]
	United Kingdom	2	[6,8]
	Germany	1	[73]
Ethnic majority	White and 'Caucasian'	5	[7,8,69,71,72]
	African-American	2	[65,67]
	Hispanic-American	2	[66,68]
	Not reported	5	[6,9,70,73,74]
Health condition	Type 1 diabetes	1	[70]
	Dental malocclusion	1	[9]
	Leukemia (remission)	1	[69]
	Nocturnal enuresis	1	[6]
	Asthma	7	[7,8,65-68,73]
	Cystic fibrosis	1	[74]
	Encopresis	1	[71]
	Sickle cell disease	1	[65]
	Recurrent headache (non-malignant)	1	[72]
Sample size	Reported sample size calculation	3	[6,7,71]
	No sample size calculation; total participants n < 120	6	[8,65,69,70,72,74]
	No sample size calculation; total participants n ≥ 120	5	[9,66-68,73]
Intervention	< 6 months	7	[6,9,65,69,71,72,74]
length	≥ 6 months	7	[7,8,66-68,70,73]
Follow-up	None	10	[7-9,65-67,69-71,74]
(post- intervention)	< 6 months	1	[72]
	≥ 6 months	3	[6,68,73]
Quality assessment ratings	0	0	
	½	0	
	1	1	[9]
	1½	1	[74]
	2	5	[6,7,67,70,73]
	2½	3	[65,66,71]
	3	3	[68,69,72]
	3½	1	[8]
	4	0	

Studies with more than the conventionally accepted 20% study drop out rate [77] were classed as high risk for attrition bias. Attrition rates in many of the studies were difficult to quantify; two studies [70,71] neglected to address children lost to follow-up and a further three papers [65,67,69] provided insufficient detail on non-completers, the point at which children dropped out, whether they belonged to the intervention or comparison group and/or the reasons for their attrition. These three studies, together with Runge, *et al.* [73], Homer, *et al.* [66] and Eckler [9] had relatively high drop out rates. The work by Bartholomew, *et al.* [68] could also be placed in this category, however their higher drop out numbers should be balanced with the fact that their study spanned three years.

The included papers are mostly unclear about the potential for performance bias. Several researchers took steps to limit subjective outcomes: interviewers in the study by Dragone, *et al.* [69] were taught to avoid biasing subjective outcomes during training sessions; and neurologists in the paper by Connelly, *et al.* [72] were blinded to the child's group allocation; and interim phone contacts, relating to medical issues, were handled by nursing staff not directly affiliated with the research. A number of

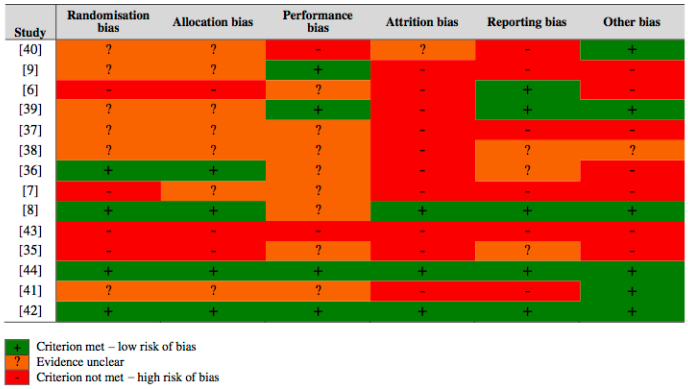

Figure 2 Individual risk of bias ratings.

papers [6,66-68,70,71,73,74] overlooked the potential impact lack of blinding may have had on study outcomes.

Quality assessment

Aside from the risk of bias, the quality of this type of research also relies on the design of the MI itself. Assessing the papers in this way enabled an important cross-referencing of the extent to which the evidence they hold was potentially valid. The results of the quality assessment, Table 4, confirmed the strength of the research by [72] and [8]. However, it also rated 9 out of the 14 included studies as 'medium' quality, with Davis, *et al.* [74] the poorest of these. This study omitted details on the development and age-appropriateness of the *STARBRIGHT World* website (used in the research), raising questions over the suitability of the MI and therefore the validity of the study findings.

A number of the other papers struggled to demonstrate sufficient detail in these areas. Figure 3 combines the quality assessments for the included studies. The two main difficulties were; a lack of MI piloting or testing before undertaking the research, and the age range amongst the child-participants. This second quality, the gap in age between the youngest and oldest study participants, is critical to the success of the study. Resources, and MIs, should be designed with a particular audience in mind [64], aiming to appeal to the senses and cognitive ability of that age group [56]. Where the age gap of the recruited children is too wide, the MI cannot successfully engage all of the children in the study, having a potentially detrimental effect on study findings.

One of the more extreme examples of not achieving this quality indicator was found in an asthma study by Krishna, *et al.* [7], that included infants, toddlers, preadolescents, and teenagers. Children below the age of seven were deemed too young for the *Interactive Multimedia Program for Asthma Control (IMPACT)*, their parents effectively becoming the study participants and using the MI on the child's behalf. Those aged between 7 and 17-years used the same MI under similar conditions. It is unlikely that a single MI would be appropriate, or indeed engaging, for such a wide age range. Disparities may include; visual presentation and design, use of language and text, navigation, and content presentation [59,64]. Aspects of a MI that appeal to the child may not necessarily hold the attention of the parent. For example:

> "*We had anticipated that parents of younger children with asthma would actually use the program themselves, but we found that the program did not consistently engage parents–except the more didactic video elements*" [66], p. 214

which children found interfered with the game aspects of the MI. Several others [6,9,65-67,73] chose to recruit children of significant age differences (Figure 4); 9 to 12-years older than the youngest in the same study. Of these, Bartholomew, *et al.* [67] and Hazzard, *et al.* [65] took steps to account for the pedagogical needs of the more mature children by introducing alternative coaching character roles and more advanced levels within the MI, respectively. Dragone, *et al.* [69] demonstrated good quality MI design in their multi-levelled *Kidz with Leukemia: A Space Adventure*, ensuring that the differing presentation and information needs of the younger (4 to 6-year-olds) and older (7 to 11-year-old) children were accommodated through extensive piloting.

Studies were generally better at their measurement of the time children spent using the MI, their reporting

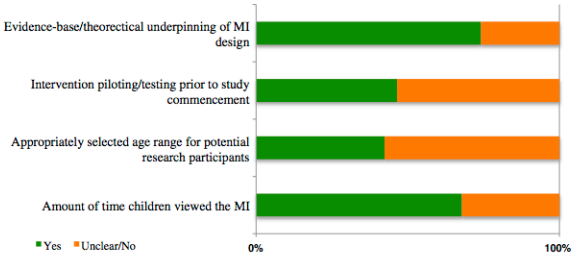

Figure 3 Overall quality assessment summary.

thereof, or both. Nevertheless, 4 [6,67-69] of the 14 studies failed to provide adequate detail. Of the studies that did provide data, two [7,70] offered self-reported estimates of duration and frequency of use, with no apparent means of validating the data. Runge, *et al.* [73] used the time children were logged onto the server as the time they spent using the MI. Six studies demonstrated greater reliability in their data tracking methods through built-in intervention monitoring [65], researcher monitoring [9,66], and required activities and assignments [71,72,74].

In evaluating its effect on knowledge, self-efficacy and/or health behaviour change, the time children are exposed to a MI has a bearing on the extent to which it had the opportunity to affect attitudes and motivation to change [56,57]. The ten studies that reported on this quality indicator differed significantly in the time children spent using the intervention, from less than 30-minutes to 34-hours).

Heterogeneity

The included studies differed on many levels: including participant mean ages; the purpose and design of the MI; comparative intervention (such as leaflets, books, or non-health-related multimedia) used; setting and conditions under which children used the MI (Table 5), and the extent to which health professionals engaged in intervention delivery. These and other differences made comparing data and study outcomes difficult.

Participant age

While there was a wide age variation amongst study participants, several papers [7,65,69] analysed data within

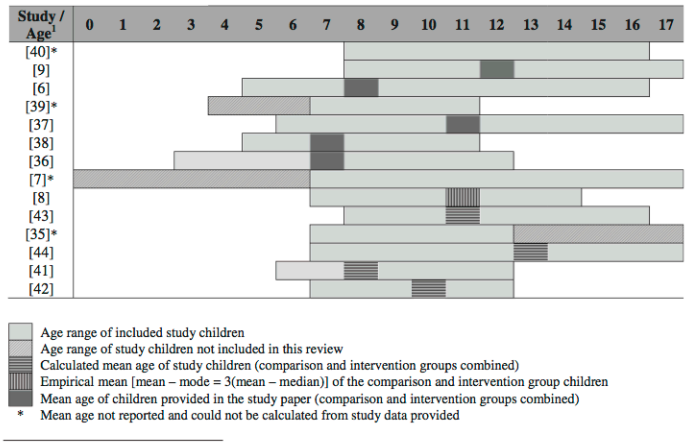

Figure 4 Age range and mean age of participants.

Table 5 Intervention and comparison group characteristics

Criterion	Category	No. of studies	And references
MI type	Nintendo® game console	1	[70]
	CD-ROM	9	[6,8,9,66-69,72,74]
	Web-based	4	[7,65,71,73]
MI group information formats[1]	Multimedia only	13	[6,8,9,65-74]
	Multimedia + written information	1	[7]
Comparison group	None§*	7	[65,67,70-74]
information formats[1]	Written information, e.g. leaflets*	5	[6-8,66,69]
	Conventional aids, i.e. dental models, radiographs*	1	[9]
	Not reported	1	[68]
Intervention setting	Outpatient clinic	6	[6,7,9,66,67,74]
	During hospitalisation	1	[65]
	At home	6	[8,69-73]
	At school (school nurse office)	1	[68]
Time MI used	< 60 minutes	2	[9,74]
	1–2 hours	4	[7,8,65,71]
	≥ 2 hours	4	[66,70,72,73]
	Unclear	2	[67,69]
	Not reported	2	[6,68]
Intervention length	< 6 months	7	[6,9,65,69,71,72,74]
	≥ 6 months	7	[7,8,66-68,70,73]
Follow-up	None	10	[7-9,65-67,69-71,74]
(post-intervention)	< 6 months	1	[72]
	≥ 6 months	3	[6,68,73]

*Redsell, *et al.* [6], Eckler [9] and Runge, *et al.* [73] included more than one comparison group–the wait-list groups (receiving no treatment) were disregarded for the purpose of this review. Comparison group children in the study by Homer, *et al.* [66] were given an asthma book and played a non-health-related computer game.
§Brown, *et al.* [70] provided a non-health-related Nintendo® game to children in the comparison group.
[1]in addition to verbal treatment.

narrower age groups. Data relating to the age category closest to, and incorporating 7 to 11-year-olds, were selected for inclusion. Only two studies focussed on 7 to 11, or 7 to 12-year-olds; either as the total study population [72], or analysed as a subgroup [69]. Differing age ranges in turn affected the mean ages of recruited children.

The ability to compare mean ages was compromised by a lack of data. With the exception of five studies [6,9,66-68], papers failed to provide the mean age of recruited children. One paper reported the median age of the comparison and intervention group [8] instead of the mean. This study reported a significant age difference ($p = 0.012$) between the two groups. Five studies [7,65,68-70] offered no indication as to group similarity or differences in participant's mean ages. Where necessary, and feasible, the mean age of participants was calculated from study data [8,71-74] (Figure 4). Within the ten studies, the mean age of children was 10.11 ± 2.13 with the mean range from 7.40 to 13.05-years.

Multimedia intervention (MI)

The heterogeneity evident in the age ranges of child-participants was further apparent in the MIs themselves (Table 5). Diversity existed on a number levels; including platform delivery (CD-ROM, web-based, etc.) and the setting in which child-participants accessed the MI (medical settings, school, home, etc.).

Perhaps the most obvious difference between the selected studies was what the MIs were designed to achieve. Most of the interventions had either stated or implied aims of educating children about their health-related condition; and improving skills and confidence to manage symptoms, triggers and medication. Some MIs [65,69,70,73] had an additional dimension; to improve social support. *Kidz with Leukemia: A Space Adventure* provided a short video clip on *"siblings views on leukemia"* [69], p. 299. *Packy and Marlon* [70] had a two-player option, in which children needed to help one another to succeed in the game, encouraging children to communicate with others about their diabetes. The

interventions used by Hazzard, *et al.* [65] and Runge, *et al.* [73] both offered chatroom facilities; Hazzard *et al.* featured videoconferencing, and Runge *et al.* enabled email contact with other children. Social networking and peer-to-peer communication opportunities may have affected study outcomes, such as self-efficacy and motivation to change, to a greater or lesser degree, thereby confounding the effect of the MIs that relied solely on animation design elements.

Outcomes may also have been influenced by the extent to which health professionals were engaged in the MI. Clinicians were more involved in the MI delivery in three studies [6,9,73], although clinicians were only consistently involved with each child (and their family) in the Eckler [9] study; orthodontists actively using the MI to deliver information within the consultation. In contrast, Redsell, *et al.* [6] mentions a 'passport' given to children to indicate the MI modules they had worked through and record comments for later discussion with the school nurse, but omits to report on whether this resulted in children and school nurses discussing the MI. Similarly, asthma experts (not the children's health professionals) in Runge, *et al.* [73] were available online for scheduled chatroom chats and via email but it is unclear the extent to which these facilities were used. In an attempt to prevent performance bias, two studies [7,72] aimed to avert child-clinician communication about the intervention through blinding. Bartholomew, *et al.* [67] and Bartholomew, *et al.* [68] actively encouraged physicians to become more involved in the care of children using the MI. Researchers encountered a general resistance, these health professionals cited lack of time [68] and the MI content not suited to their institution's clinical procedures [69] as barriers to engaging with the MI.

In addition to the MI, some studies provided additional information to intervention group children. Children in nine of the included studies [8,9,66-71,74] were given the MI only. Others were given the MI as well as education sessions [73] or more frequent face-to-face consultations [6,65,72]. One study [7] provided written information as well as periodic contact with a health professional. Other papers failed to clarify whether or not health information was given to children in the comparison group [68] or what form this may have taken [9]. Inequality in study intervention approaches hinders comparison of results. One might argue that these anomalies could be accounted for by the choice of comparison treatment.

A number of MIs [6,9,66,67,74,75] were designed for use at outpatient clinic settings. There was variation within these studies; one researcher demonstrated the MI [9], others offered researcher assistance, as required [66,74], and another did not state the level of support available [6]. Five studies required children to work independently, at home [8,69,70,72,73]. Again, not all had a similar experience; Connelly, *et al.* [72] posted the MI to the child's home, while Mcpherson, *et al.* [8] and Ritterband, *et al.* [71] visited children in their homes to offer initial support. Some children used the MI in the nurse's office at school [68] and others during a period of hospitalisation [65]. The setting and level of researcher involvement will have affected children's experiences of the MI, particularly for younger or less confident children, thereby creating discrepancies between study findings.

Multimedia intervention (MI) use, study duration and follow-up

There were significant differences of MI use, both within and between studies. Some studies [6,9,72] controlled the order in which multimedia modules were viewed, or indeed offered a limited time in which children were able to use the MI [74]. Other studies [65-67,69-71,73] allowed children freedom over how they chose to use the MI, if at all. Consequently, reported MI usage also varied greatly. Some children [9,74] had a total of 30-minutes or less, and others [70] were reported to have used the interventions for up to 34-hours.

The study period for half of the interventions were for less than six-months; one [9] was used within a half-hour consultation, another [65] spanned three-days, while the majority of shorter studies were for three [69,74] or four-months [6]. Of those lasting 6-months or more, 3 [8,70,73] ended at 6-months, 2 [7,68] were for 12-months and one study [67] had a mean duration of 7.6-months, with participant involvement ranging from 4 to 15.6-months. Most (10 of the 14) studies had no follow-up period (Table 4). Connelly, *et al.* [72] tracked outcomes for three-months post-intervention and two studies [6,73] had a six-month follow-up period. One school-based study [68] continued to collect data for two years post-intervention.

Variations in intervention usage, study duration and follow-up period all would have influenced the opportunities children had to familiarise themselves with the multimedia content, and subsequently make behavioural changes.

Outcome measures

Prior to exploring the potential health outcomes, the measures used to determine these outcomes should be examined. Of the 14 included studies, all but 2 [67,68] use the same measures for knowledge acquisition, changes in self-efficacy and health outcomes. Dragone, *et al.* [69] and Mcpherson, *et al.* [8] derive their self-efficacy 'Health Locus of Control' measure from the same source (Table 6). Measures used to evaluate knowledge gain and differences in self-efficacy were validated prior to their use in most

Table 6 Multimedia intervention outcome measures and intervention effects

Study outcome	No. of studies	Study	Outcome measures/scale[1]	Reliability tested[2]	p-value[3]	ES (d)
Communication	2	[70]	*No. child-initiated diabetes discussions:* Parent recall (one month)	No	0.0025	
		[9]	Child Satisfaction Survey:	No		
			Felt involved in the consultation		<0.05	
			Orthodontist understands me		ns	
Satisfaction	3[5]	[70]	*User satisfaction:* Instrument not described	No	ns	
		[9]	*Liked the explanation:* Satisfaction Survey[4]	No	ns	
		[69]	Satisfaction and Use Questionnaire:	No		
			Used assigned intervention ≥ once		0.001	
			Used intervention 'for a long time'		0.0006	
			Found intervention 'easy to use'		ns	
DNA rate	3	[6]	*DNA at least 1 appt*	N/A	ns	
			DNA two consecutive appts	N/A	N/K[6]	
		[67]	*Appts kept out of total planned appointments*	N/A	0.04	
		[66]	*Appts kept out of total planned appointments*	N/A	ns	
Knowledge acquisition	12	[70]	Interview questions, blood glucose logbook, food exchange chart	No	ns	
		[9]	Child Short Answer Knowledge Questionnaire[4]:	No		
			Three major orthodontic problems		<0.05	
			Two orthodontic appliances/devices used		ns	
			Three risks		ns	
			Two instructions followed		ns	
			Total recall and retention of information presented		<0.05	
		[69]	Leukemia Event Knowledge Interview [78]	Yes	0.039	
		[74]	Cystic Fibrosis Knowledge Questionnaire (adapted Quittner & Drotar (1997))[7]	Yes	<0.001	
		[67]	Child Knowledge of Asthma Management Questionnaire	Yes		0.17
		[66]	Child Knowledge of Asthma Questionnaire	No	<0.001	
		[7]	Pediatric Asthma Care Knowledge Survey	No	ns	
		[68]	Child Knowledge of Asthma Management Questionnaire [67]	Yes	<0.0001	
		[8]	Asthma Knowledge Assessment	Yes	0.001	
		[65][8]	Asthma Knowledge Scale (modified [79])	Yes	ns	
			How Much Do I Know About Sickle Cell Disease? Questionnaire (shortened [80])	Yes	ns	
		[71]	Encopresis Knowledge Questionnaire	No	ns	
			Virginia Encopresis/Constipation Apperception Test [81]	Yes	ns	
Changes in self-efficacy	10	[70]	Interview questions	No	0.025	
		[9]	Child Satisfaction Survey[4]:	No		
			'Satisfied that I know the causes'		ns	
			'Satisfied that I know the treatment'		ns	
			'Satisfied that I know the expected outcome'		ns	
			'Satisfied that I know the risks'		ns	
			'Satisfied with the explanation of the problems'		<0.05	
			'Confidence in the Orthodontist'		ns	
			'Not afraid of the treatment'		ns	
		[69]	Leukemia Children's Health Locus of Control [82]	Yes	0.005	

Table 6 Multimedia intervention outcome measures and intervention effects *(Continued)*

		[74]	Role Play Inventory of Situations and Copy Skills [83]	Yes	<0.001	
		[6]	Self-esteem Scale (shortened [84])	No	0.02	
		[67]	Child Self-efficacy Expectations Questionnaire	Yes		0.06
		[68]	Child Self-efficacy Expectations Questionnaire [67]	Yes	<0.0001	
		[66]	Parent recall: *Child attitude toward asthma care*	No	ns	
			Parent recall: *Behaviours related to asthma care*	No	ns	
		[8]	Children's Asthma Locus of Control ([85], derived from [82])	Yes	0.007	0.5
		[65][8]	Kidcope [86]	Yes	ns	
			Kidcope [86]	Yes	ns	
Health outcomes/ symptoms	10	[70]	Long-term *blood glucose control*: HbA1c measurements	No	ns	
		[6]	*Time to dry (Length of time to achieve 14 consecutive dry nights):* Not described	Not stated	ns	
			Dry on discharge: Not described	Not stated	ns	
			Dry 6 months post-discharge: Questionnaire not described	Not stated	ns	
		[72]	*Headache activity:* Headache Index Composite calculated from Headache Diary [87]	Yes	0.04	
			Headache frequency, duration and severity: Pediatric Migraine Disability Assessment [88]	Yes	ns	
		[67]	*Asthma symptoms:* Usherwood Symptom Questionnaire [89]	Yes	0.02[9]	
		[66]	*Asthma severity:* Parent recall	No	ns	
		[7]	*Lung function (FEV_1):* Instrument not described	Not stated	ns	
			Days of *asthma symptoms* since last visit:	No	<0.01	
			Parent recall			
		[68]	*Asthma symptoms:* Usherwood Symptom Questionnaire [89]	Yes	ns	
		[8]	*Lung function (FEV_1):* Micromedical Super-Spiro spirometer	Not stated	ns	
			Lung function (PEF): Mini-Wright Peak Flow Meter	Not stated	ns	
		[73]	*Lung function (FEV_1):* Instrument not described	Not stated	ns	
			Lung function (PEF): Instrument not described	Not stated	ns	
		[71]	Child Information Form:	No		
			Trips to toilet without parental prompt		0.109	
			Bowel movements in the toilet		0.001	
			Overall encopresis symptom improvement		0.018	
Emergency medical visits	6	[70]	*Emergency room/GP visits over past 3 months*[10]: Parent recall	No	ns	
		[67]	*Number of visits over past year:* Parent recall	No		0.03
		[66]	*Emergency room visits:* Parent recall	No	ns	
			Acute GP visits: Parent recall	No	ns	
		[7]	Asthma Summary Since Last Visit Questionnaire:	No		
			Urgent medical visits		<0.0001	
			Emergency room visits		0.0219	
		[8]	*Unscheduled visits to the GP over past month:* Parent recall	No	ns	
		[73]	*Emergency room visits over past 6 months:* Parent questionnaire and GP electronic record	Not stated	ns	
Hospitalisation	6	[70]	*Hospitalisation over past 3 months*[10]: Parent recall	No	ns	
		[67]	*Hospitalisation over past year:* Parent recall	No		−0.14

Table 6 Multimedia intervention outcome measures and intervention effects *(Continued)*

[7]	Asthma Summary Since Last Visit Questionnaire:	No	
	Hospitalisation		0.0313
	Days of stay in hospital		ns
[68]	*Hospitalisation over past year:* Parent recall	No	ns
[8]	*Hospitalisation over past month:* Parent recall	No	ns
[73]	*Days of stay in hospital over past 6 months:* Parent questionnaire and GP electronic record	Not stated	ns

ES–effect size ns–not significant DNA–Did not attend Appt–appointment N/A–not applicable No.–number of FEV_1–Forced expiratory volume PEV–Peak expiratory volume GP–General practitioner HbA1c–glycated haemoglobin N/K–not known.
[1]instruments or scales were developed by the authors, unless referenced.
[2]reliability of outcome measure/scale tested using Cronbach's alpha.
[3]$p \leq 0.05$.
[4]several questions could equally be categorised as 'communication', 'satisfaction' or 'self-efficacy'. The most appropriate question(s) have been included in this Table.
[5]Homer, *et al.* [66] lacked comparison group satisfaction data, and have therefore not been included.
[6]not known–a chi-square test revealed no statistical significance between the 3 groups (which included a wait-list group) but no sub-analysis of the intervention and comparison group was provided.
[7]*unable to find reference*: Quittner, A.L. & Drotar, D. Controlled trial of family interventions for cystic fibrosis. [Research grant] National Institute of Health–October 1997-August 2003.
[8]Hazzard, *et al.* [65] utilised the STARBRIGHT World MI to explore it's effect on children with asthma and sickle cell disease. The data is dealt with separately.
[9]significant only for those children with milder asthma symptoms.
[10]measured together, as emergency room/GP visits and hospitalisation.

studies reporting these outcomes. There was less certainty over the reliability of instruments used to measure changes in specified health conditions, or specific health symptoms such as HbA1c (glycated haemoglobin, an indicator of long term blood glucose control in diabetes) or FEV_1 (forced expiratory volume, used as a measure of lung function in asthma management). With the exception of Bartholomew, *et al.* [67], Bartholomew, *et al.* [68], and Connelly, *et al.* [72], the included papers neglected to provide adequate information about the instruments used to measure health outcomes. In one study [70], children were recruited from two paediatric diabetic clinics that sent blood samples to different pathology laboratories, each using different HbA1c normative reference ranges.

A number of health outcomes depended on parent recall. These included episodes of emergency medical care and hospitalisation for the chronic condition under investigation. Timescales for recollecting these episodes of emergency care varied from one-month [8] to three-months [70], six-months [73], nine-months [7] and even 12-months [67]. Memory is inherently unreliable. Only Runge, *et al.* [73] attempted to validate the reliability of the data obtained through parent recall, by using GP electronic records.

Despite the diversity of the research presented in these papers, and their associated methodological differences and limitations, there is value in reflecting on individual study outcomes.

Study outcomes

Communication

The stated aim of this review was to evaluate the effectiveness of MIs in promoting the quality of face-to-face communication between health professionals and children, within a health context. One paper [9] aimed to facilitate child-clinician communication. In this study, orthodontists used a MI to clarify treatment options with children and parents. Children who viewed the MI felt more involved in the consultation ($p < 0.05$) but did not report to feel more understood by the orthodontist (p = ns). Another study considered the effect of a MI on a different type of face-to-face interaction; Brown, et al. [70] considered its effect on children talking to parents about diabetes. The study found the effect to be statistically significant ($p = 0.0025$).

Satisfaction

Of further interest, was the extent to which MIs affected the child's (and family's) involvement in their healthcare or treatment. Outcomes connected to this aim are attendance rates and relative satisfaction with the MI. However, for both outcomes, minimal comparison data were available.

Three studies reported on appointment attendance. Bartholomew, *et al.* [67] cited significantly greater attendance rates among intervention group children. In contrast, Homer, *et al.* [66] found no significant difference between the intervention and comparison groups in this regard. However, data from Redsell, *et al.* [6] are less clear. The paper reports no difference in attendance rates. Isolating the data of children who failed to attend two consecutive appointments; 26 (24.1%) of the intervention group versus 12 (13.8%) of the comparison group; implied better appointment attendance amongst children who did not use the MI [6]. This leads to an

inconclusive assessment of the affect of MIs on attendance rates.

Another proxy for evaluating the quality of communication should be satisfaction with care. However, data were extracted from only three papers [9,69,70]. Outcomes from several of the included studies [7,8,65,67,71] were discounted because of a lack of comparison group data. Davis, *et al.* [74] designed a cross-over trial, having no comparison group for this outcome measure. Homer, *et al.* [66] reported no significant group differences for parental satisfaction on physician communication, physician involvement or overall care. The study reported that healthcare professionals were not engaged in the MI and neither were parents; with some parents choosing to sit in a separate room, away from where their child was using the MI, potentially explaining this finding. The 'not significant' outcome of Brown, *et al.* [70] could be interpreted as the MI was no more engaging than the alternative treatment. In this case however, the comparison group received a non-health-related MI. These data could therefore equally be interpreted; that the health-related MI was as enjoyable as the entertainment game. In fact, children in this study used the MI for an average of 18-hours in the first 3-months and 16-hours in the second 3-months. Likewise, Eckler [9] found no significant difference in preference for either the MI or traditional visual aids–dental models, radiographs and photographs–all of which could conceivably be interesting and informative to children within a consultation-setting. Data from Dragone, *et al.* [69] implied that the MI was equally as useable as the book, but potentially more engaging (as more children used the MI more often and for longer).

Of the three studies, Dragone, *et al.* [69] was rated 'high' quality and at lower risk of bias. However, it would be unreasonable to judge the extent to which MIs encourage 7 to 11-year-old child engagement with health-related treatment, based on 17 children.

Knowledge acquisition

The findings for the effect of MIs on knowledge gained are mixed. Six MIs [7,65,67,70,71] were found to be no more helpful than comparative interventions. The other six MIs were found to be effective [9,69] or very effective [8,66,68,74] education devices. Three [8,69,74] of these studies had a comparatively more robust research strategy, lending more weight to the suggestion that multimedia may be a worthwhile health education tool. Moreover, equipped with greater knowledge about a health condition, and it's treatment, may enable children to understand health-related conversation in a more meaningful way, thereby facilitating their future involvement in consultations-settings with health professionals [2].

Changes in self-efficacy

Apart from Hazzard, *et al.* [65] and Homer, *et al.* [66], all studies reporting on self-efficacy, presented data pointing towards a significant link between MIs and enhanced self-belief [6,8,67,70], a number of which were highly significant [68,69,74]. Although intervention children in the Eckler [9] study were no more confident about their treatment than their counterparts in the comparison group, they were sure of the problems associated with the proposed orthodontic treatment. These data echo those reported for knowledge acquisition.

Self-belief is affected by the time spent learning and practising new behaviours, as confirmed by Bartholomew, *et al.* [67] who found a correlation between time using the MI, and self-efficacy. Children using the *STARBRIGHT: Fitting Cystic Fibrosis into your Everyday Life* MI, only used it for 30 minutes [74], probably not enough time to influence self-belief in a meaningful way. Children in the Mcpherson, *et al.* [8] study typically used the *Asthma Files* once, for 60 to 90 minutes.

Care must be taken when quantifying the variable and subjective nature of self-efficacy. However, children who feel more able to manage their health condition have a degree of self-control that may afford them greater self-confidence when communicating with clinicians. Parental involvement in the education activity will likely also play a role in a child's ability to improve self-management [66].

Health outcomes

The litmus test of someone's ability to cope with, or manage, a health condition is how this translates into physical health and wellbeing. Likewise, the ultimate goal of many of these MIs is to change health behaviour and improve disease-related symptoms.

Of the four studies [7,67,71,72] that described MIs as having made a significant improvement to symptoms; three [7,67,72] demonstrated inconsistencies. Krishna, *et al.* [7] found a correlation between use of the *IMPACT* MI and fewer days of asthma symptoms. However, this outcome was not confirmed by an improvement in lung function (FEV_1). Bartholomew, *et al.* [67] reported fewer asthma symptoms, but only in children with mild asthma. Connelly, *et al.* [72] too had mixed results. The *Headache Index Composite* score (derived from data collected through headache diaries) was lower in children who used the MI. However, the *Pediatric Migraine Disability Assessment* questionnaire showed no significant difference between the intervention and comparison group children. The authors pointed out that, following the one-month intervention, children were tracked only for a further three-months but their data points towards a

gradual decline in *Migraine Disability* scores amongst children who used the MI.

One of the major limitations for many of the identified studies [7,67,71] was the brief length of post-intervention follow-up. Despite these, some MIs have played some role in improving health outcomes for some children.

Need for emergency medical treatment or hospitalisation

The evidence analysed thus far suggest that MIs are less beneficial for severe medical conditions. Based on this assumption, emergency medical care and hospitalisation rates would not benefit from MIs. Data presented in Table 6 confirms that only one [7] out of the handful studies reporting on this area, found MIs to be effective to this end.

Limitations

As with any investigation of this kind, these results should be interpreted mindful of the limitations, not only of the research literature but also of the methods used to identify the research. To begin with, identification of potentially relevant papers was hindered by authors' use of keywords, and keywords definitions offered by database thesauri. Only 5 of the 14 included studies were found through a systematic search of 12 databases. This is in part due to technology advancements and the changing terms then used to describe them [90]. Secondly, relatively few papers met the inclusion criteria and the evidence presented by most of these studies evaluated poorly on a variety of levels. The third limitation was that heterogeneity between studies prohibited meta-analysis of data. Lastly, the research presented in this review could be more appropriately described as pilot studies. Focus needs to be placed on undertaking better quality studies that adequately investigate the role of technology in health communication.

Discussion

Most of the identified papers were published between 2000 and 2006, representing studies that took place at the end of the 1990s and the first few years of the 21st century. Interestingly, no more recent research was found, despite the apparent usefulness of MIs.

This review was undertaken to inform the development of a diet-related MI for use with overweight children. It should be noted that none of the included MIs were designed for overweight children. The one study [40], that did aim to engage preadolescent overweight children by integrating an activity-promoting MI into an obesity programme did not meet the meet the inclusion criteria for this review (see Table 2). Post-intervention scores showed a significant reduction in BMI, screen time and carbonated drink intake, with increased physical activity levels at the end of the 10-week programme but in common with included studies, impact on communication was not evaluated. This highlights how the capacity for MIs to support health-related communication in the area of child weight management, has been neglected.

Research has tended to define MIs as efficient resources to improve knowledge and promote self-efficacy independently of health professionals, seeking to exploit their cost-benefit in providing alternative healthcare rather than understanding their role in enhancing existing clinical practice. Some studies [6,9,73] encouraged health professionals to interact with the children using the MIs, but the level of engagement was not reported, raising doubts over its emphasis and importance within the research. Bartholomew, *et al.* [67] implied that clinician involvement might have improved asthma symptoms for those children with more complex health needs. The potential role of MIs alongside health professional involvement has not been explored.

Studies [68] had difficulty finding support for MIs among clinicians, with Dragone, *et al.* [69] achieving a 30% response rate from health professionals asked to feedback on the MI. All but two studies [70,72] involved clinicians in the MI development phases (one study [73] was unclear). Nevertheless, it is difficult to assess the extent and nature of their involvement. Approaching health experts for suitable content is vastly different to exploring how clinicians provide information to children and families, and providing the opportunity to settle on an agreed format for the MI. These papers are also unclear as to whether health professionals were involved throughout the multimedia development process, or merely at the beginning or end-point.

Tellingly, the majority of the included MIs are not in use and are likely never to have entered mainstream clinical treatment (Table 7). Twelve different MIs appeared in this systematic review. Only four of are available for use with children and families, either directly or through clinicians. Resources, including MIs, deemed irrelevant by health professionals, are generally left unused and are not integrated into clinical practice. A finding of this review confirms the importance of ensuring that MIs compliment health professional practice. The task is therefore to involve health professionals in design from the outset, ensuring that developed MIs are clinically relevant.

Proudfoot, *et al.* [57] have proposed a series of guidelines to support internet interventions. This review suggests that greater emphasis should be placed on the context within which these technologies will be used, and the communication requirements of health professionals. A development methodology that advocates participatory involvement, peer review and evaluation at different stages of MI production needs to be addressed. Investing in the production of useful MIs may

Table 7 Included multimedia interventions and on-going availability

Study	Multimedia intervention	MI description	Available/ in use	Comments
[9]	*Interactive Consult 2.0*	Stationary and moveable graphics used to illustrate orthodontic diagnosis and treatment (36 treatment plans)	No	
[70]	*Packy and Marlon*	One-or two-player game to save the diabetes summer camp from the rats and mice that have scattered the food and diabetes supplies (24 levels)	No	Extract available at http://www.youtube.com/watch?v=oWcPf_n8BgM (accessed 7 February 2013)
[6]	*All About Nocturnal Enuresis*	Animated, interactive tutorials based on paper-based pamphlet (7 tutorials)	No	
[69]	*Kidz with Leukemia: A Space Adventure*	A themed MI, providing leukemia information using interactive media, e.g. games and puzzles; and video, e.g. a hospital tour	Yes	
[67] [68]	*Watch, Discover, Think and Act*	An adventure game to make decisions about managing the game character's asthma and provide tailored treatment asthma plan.	No	
[66]	*Asthma Control*	Game simulation of daily events, while managing the superhero game character's asthma, including brief video clips about specific objects, e.g. triggers or medication	No	
[7]	*Interactive Multimedia Program for Asthma Control: IMPACT Asthma Kids*	Animated interactive tutorials about asthma symptoms and medication use, and real-life scenarios to practice decision-making (44 modules)	Yes, in adapted format	MI content has been converted into a series of interactive educational resources
[8]	*The Asthma Files*	Animated interactive secret-agent themed modules with games and quizzes and provides tailored self-management asthma plan (8 modules)	No	
[73]	Not stated	Consists of: • Adventure game incorporating asthma-related situations that have to be managed; • Asthma quizzes and material from group education sessions; • Scheduled chat sessions with asthma experts; • Online social networking with peers	No	
[65]	*STARBRIGHT World*	Intranet for hospitalised children with interactive games, arts and crafts projects, and opportunities to contact children in other hospitals online	Yes	Website is recommended for 13-20 year olds
[74]	*STARBRIGHT World: Fitting Cystic Fibrosis into your Everyday Life*	Animated interactive tutorials about eating, breathing and cystic fibrosis questions and answers (3 modules)	Yes	
[71]	*U-Can-Poop-Too*	Interactive tutorials and quizzes with illustrations about aspects of encopresis management (27 modules)	Yes	
[72]	*Headstrong*	Interactive narrated tutorials and quizzes about headache management, e.g. deep breathing and imagery, and a tailored active pain-coping plan (4 modules)	No	Available only from authors

help to clarify the potential for this type of technology to realise health behaviour change and improve health outcomes [91].

Although some of the studies were not of the highest quality, and MIs lacked focus in their design and development (a problem not unique to this review [21,92]) the study outcomes themselves are promising: MIs have the capacity to improve child-clinician communication, 7 to 11-year-old children seem to enjoy using multimedia, MIs may be useful in educating children about their health, MIs show promise in improving self-efficacy among children of this age, and these types of interventions have the potential to improve health outcomes.

Conclusion

Despite calls to investigate using health-related multimedia with face-to-face communication [20,93], the findings of this review have established this as an area of research yet to be charted, specifically within the 7 to 11-year age group.

This review suggests that MIs can lead to health-related improvements, and they hold the potential to support communication between young children and health professionals. Health professionals may need to be convinced of their benefit, and persuaded to integrate such MIs into routine healthcare. It is therefore critical that these technologies not only meet the requirements

and expectations of clinicians who might use them, but that the evidence to support (or refute) their use is robust. Further research is needed to understand the role for clinically relevant MIs to support child-clinician communication.

Abbreviations
MI: Multimedia intervention; GP: General practitioner; NNR: National Research Register; ISRCTN: International Standard Randomised Controlled Trial Number; BMI: Body mass index.

Competing interests
The authors declare that they have no competing interests.

Authors' contributions
CG and HW supervised the systematic review undertaken by CR. CR drafted the manuscript. All authors contributed to, read and approved the final manuscript.

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Appendix 2. Chapter Three published in the Journal of Human Nutrition and Dietetics

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DIETETIC AND PROFESSIONAL PRACTICE

Dietitians' perceptions of communicating with preadolescent, overweight children in the consultation setting: the potential for e-resources

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Keywords
dietitian, face-to-face communication, interactive e-resources, overweight, patient involvement, preadolescent children.

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Abstract

Background: There are calls to enhance existing child weight management interventions and to develop new treatment approaches. The potential for interactive electronic resources (e-resources) to support child–dietitian communication has yet to be explored. Towards developing such a tool, the present study aimed to understand dietetic attitudes and approaches to communicating with preadolescent overweight children in individual consultations to support behaviour change.
Methods: A purposive sample of 18 dietitians, providing weight management advice to overweight 7–11-year-old children, took part in the study. Individual semi-structured telephone interviews were conducted. Data were transcribed and then analysed using inductive thematic analysis. Content analysis was used to interpret dietetic attitude towards e-resources.
Results: Six overarching themes were identified describing dietitians' views: the complexity of treating childhood obesity, the strategic balance of dietetic communication focus between child and parent, the child's capacity to communicate affecting their contribution, dietetic approaches to verbal child communication and the features of resources that can support them, as well as dietetic expectations for resources. Independent inter-rater agreement for the themes was 76.9% and 73.1%, respectively. The majority of dietitians (n = 13) supported the concept of introducing an interactive multimedia e-resource into child weight management consultations.
Conclusions: Most dietitians sought to engage the preadolescent child in the consultation, using dietetic visual aids to complement verbal strategies and to serve as scaffolding for the conversation. There is scope for interactive e-resources to enhance communication, provided that they are flexibly tailored to meet the needs of the dietitian and the overweight child.

Introduction

The widespread problem of childhood obesity across the world has been recognised for some time (Reilly & Dorosty, 1999; James, 2004). Despite the considerable effort being put into managing and treating this problem in the UK (Aicken *et al.*, 2008), further research is needed to enhance existing interventions and to develop other approaches for treating overweight and obese children (Epstein & Wrotniak, 2010). The National Institute for Health and Care Excellence (NICE, 2013) has recommended qualitative research into the views and experiences of health professionals delivering child weight management interventions, as well as those of their clients. A number of recent studies have produced some valuable data in this field, such as the finding that preadolescent children want the opportunity to participate more in their dietary treatment (Dixey *et al.*, 2001;

Murtagh *et al.*, 2006). However, most have investigated parent and child perspectives (Edmunds, 2005; Stewart *et al.*, 2008; Hester *et al.*, 2010; Turner *et al.*, 2012). Studies that have explored the insights of health professionals have tended to include general practitioners, practice nurses and school nurses, but not dietitians (Walker *et al.*, 2007; Turner *et al.*, 2009; Visram *et al.*, 2013).

There have also been calls to innovate weight management interventions. Staniford *et al.* (2011) suggested introducing technology-based strategies to tailor treatment according to factors, such as the child's age and readiness to change, in addition to the regular support of weight management clinicians that families in other studies (Murtagh *et al.*, 2006; Stewart *et al.*, 2008) also reported as invaluable. Although the concept of tailoring information through computer-based solutions is not new (Dijkstra & De Vries, 1999), using technology to enhance face-to-face consultations with dietitians may offer a fresh perspective. A recent systematic review (Raaff *et al.*, 2014) identified 14 interventions that had used multimedia technology within a clinical service to improve health outcomes amongst 7–11-year-old children. None had adequately investigated the potential for such technologies to enhance health professionals' communication with preadolescent children. However, there is a case for using appropriately designed resources to provide scaffolding for conversations with young children (Gauvain & Cole, 1997), thereby improving their capacity to communicate in a consultation.

The present study was undertaken to inform the development of a dietetic interactive e-resource for weight management appointments with 7–11-year-old children. Accordingly, the study aimed to explore dietetic views, attitudes and approaches to weight management appointments with preadolescent children. In addition, the study sought to gauge dietetic opinion on the use of interactive e-resources to support child–dietitian communication.

Materials and methods

Design

This cross-sectional, qualitative study used semi-structured telephone interviews to explore dietetic views on communicating with children about weight management. The target sample size was 20 participants.

Recruitment

Purposive sampling intended to recruit dietitians and dietetic assistants (with experience of providing weight management advice to overweight 7–11-year-olds) through two British Dietetic Association (BDA) specialist interest groups in the UK: DOM UK (Dietitians in Obesity Management) and the Paediatric Group. An e-flier invited interest from member and nonmember dietitian and dietetic assistant colleagues. Potential participants were asked to read an online information sheet and to submit a consent form via the SurveyMonkey® website. Alternatively, those interested in taking part were able to contact the researcher to receive the information sheet and consent form by post or e-mail. After submission of consent forms, the researcher contacted the participants to arrange a telephone interview.

Participants

No dietetic assistants responded to the study invitation. Almost all of the 18 dietitians who took part in the study were female and worked in the National Health Service (NHS). Most (n = 14) practised in England, across 13 geographical English counties, with others from Wales, Northern Ireland and the Republic of Ireland. Participant characteristics are summarised in Table 1. Seven were full-time paediatric dietitians; the remainder provided dietetic treatment to children on a part-time basis.

A range of different child weight management services were represented by the participants. Some dietitians treated overweight children within general paediatric consultations; half (n = 9) were commissioned to provide a specialist child weight management service either as the sole dietitian or in partnership with other dietitians, or as part of a multidisciplinary team (n = 4). Nondietitian team members varied from health promotion advisors and dietetic assistants, school nurses, physiotherapists, and occupational therapists, to a consultant paediatrician, and a physical activity advisor.The time allocated for dietitians to spend with each overweight child varied considerably (Table 1). All but one dietitian offered individual appointments.

Statistical analysis

Each interview lasted a mean (SD) of 31.24 (7.51) min. The recording equipment failed during one interview, resulting in an inaudible data file. In this case, the data were summarised within 4 h of the interview, from the researcher's memory and detailed interview notes, and separated from the main data set, being used only to comment on emerging themes. The remaining 17 interviews were transcribed verbatim by the researcher. A code was assigned to each participant to preserve confidentiality and anonymity. Participant identifiers were stored separately and all data were stored in password-protected files.

Data were analysed using inductive theme analysis (Braun & Clarke, 2006). This process involved identifying interesting features and patterns in the transcripts. Significant topics, as well as recurring views or concepts, were

Table 1 Participant characteristics: dietetic experience and practice

Characteristic	Range/measure	Number of dietitians
Paediatric employment[1] (h/week)	≤7.5 h	3
	7.6–15 h	1
	15.1–22.5 h	3
	22.6–30 h	2
	30.1–37.5 h	9
	Range (h): 2.00–37.50 Mean (h): 25.90 SD: 13.34	
Experience[2] (years)	≤2 years	6
	>2–5 years	5
	>5–10 years	2
	>10–15 years	4
	>15–20 years	1
	Range (years): 0.25–16.00 Mean (years): 6.25 SD: 5.35	
Patient contact[3] (children/week)	0–2 children	9
	3–5 children	6
	6–7 children	0
	8–10 children	3*
	Range (children): <1–10 Mean (children): 3.31 SD: 3.11	
Initial consultations[4] (min/appointment)	60 min	2
	40–45 min	5
	30 min	10
Review consultations[5] (min/appointment)	Flexible (40–60 min)	3
	30 min	6
	15 min	6

[1]Current employment in paediatric dietetics
[2]Experience in child weight management
[3]Estimated number of 7-11-year-old children seen each week
[4]Length of initial child weight management appointments (n=16: one dietitian only saw 7–11-year-old children and their families within group settings, i.e. no individual initial or follow-up appointments)
[5]Length of review appointments with overweight children (n=14)

provisionally coded and organised into potential related categories. A systematic and iterative approach was taken in which transcripts and coded data were read and re-read several times until a rough structure to the data began to emerge. During the fourth and fifth cycles, a theme structure developed, along with a codebook as described by Boyatzis (1998). Each theme was described by a meaningful label, descriptors, indicators of the theme, an example excerpt and relevant exclusions. The codebook was subsequently reapplied to the dataset; previously coded data were checked and themes were refined. No new themes were identified during the final interviews, suggesting that saturation was achieved. The number of interviews that contained each theme was measured to provide some indication of the strength of the theme.

To gauge the consistency with which concepts were applied to the data (Pilnick & Swift, 2011), the reliability of the codebook was tested. The codebook was given to two independent researchers, together with a brief overview of the research and a randomly selected (Haahr, 2012) sample of 26 excerpts; two from each of the larger themes and one from smaller themes. The researchers were asked to code the excerpts into themes using the codebook descriptors. Percentage agreement between the study researcher and each of the independent researchers was used to measure reliability of the codebook (Boyatzis, 1998).

Three aspects of data were explored through content analysis. First, dietitians who use, or have used, e-resources to support child weight management consultations were noted. Next, unprompted dietitian suggestions for the potential of e-resources within consultations were extracted. Finally, dietitian response to the proposed idea of an interactive e-resource to facilitate child–dietitian communication was analysed.

Ethical approval

The present study was approved by the Faculty of Medicine and Health Sciences Ethics Committee at the University of Nottingham (ref: G15112012 CHS Diet).

Results

Six overarching themes were identified, each with two or three associated subthemes (17 in total) and these are shown in Fig. 1. Inter-rater agreement was 76.9% and 73.1%, which met the required 70% threshold recommended by Boyatzis (1998). Although each theme has been presented and expanded on separately, it is important to note that there are strong links between themes. The intricate interplay between themes demonstrates the broad nature of the research question and complexity of the resulting data. The extracts cited for the purpose of the present study include a representative sample intended to provide a coherent sense of current dietetic views and approaches on communicating with overweight 7–11-year-old children and their parents. Verbatim quotes were edited to remove nonfluences and to improve readability without altering meaning (Corden & Sainsbury, 2006).

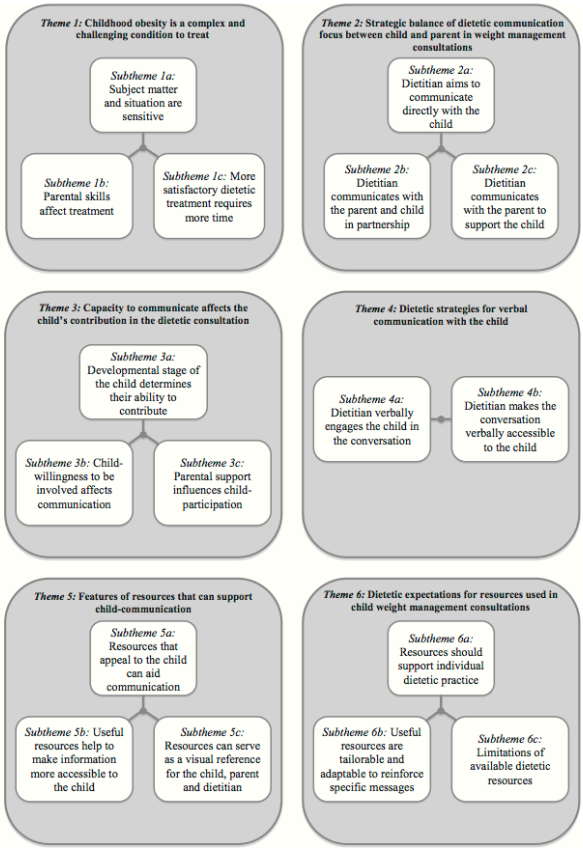

Figure 1 Themes and subthemes from interview data exploring dietitians' views of communicating with the overweight 7–11-year-old child and their family.

Theme 1: Childhood obesity is a complex and challenging condition to treat

This theme captures aspects of the consultation that can make child weight management both challenging and complex. The child may be feeling awkward or embarrassed because they know they are overweight and it is difficult to talk about. Parental guilt that their child is overweight and a lack of skills and knowledge may leave parents unsure of their role in the child's treatment. Dietitians are presented with, and expected to deal with, these complex issues within the time-constraints of an appointment.

Subtheme 1a: Subject matter and situation are sensitive (n = 14)

Simply attending the appointment may be difficult for the child:

> 'I think sometimes [the child] can be quite embarrassed about … if they … know that they are sort of overweight … they can be quite embarrassed coming and talking to you. And maybe a bit intimidated …' (P06)

Some dietitians acknowledged that they found it difficult to communicate openly and honestly with the child about their weight problem without upsetting them:

> '… I probably would like to be a little bit more confident in how [I] talk to the child and how much to push it, because [I] don't want to upset them, but at the same time, [I] don't want to be ignoring their involvement either' (P16)

Others were concerned about whether frank discussions about weight would lead to psychological harm. Several dietitians (n = 3) thought that this could be

overcome through additional specialist guidance or training. Dietitians were acutely aware of the terminology they used with children and families. There was a general consensus that the words 'obese' and 'obesity' should be avoided. There was lack of agreement about 'overweight' and 'excess weight'. Some dietitians preferred to avoid categorising the child's current weight in favour of focussing on working towards a 'healthier weight':

> 'I always try to put things in a positive perspective anyway, so not scare them but: "just try and think, this is going to be really good for you and you will get fitter and healthier"' (P04)

A third of the dietitians who took part also said that they tried to be encouraging and optimistic about how they framed the child's weight status when measurements were taken.

Subtheme 1b: Parental skills affect treatment (n = 8)

Parenting skills, education and general life skills affected the information given to families during a child weight management consultation. Parental knowledge and understanding of the situation was important, as was a parent's awareness of the part they have played in their child becoming overweight and therefore their role in helping their child to achieve a healthier weight. Many of the dietitians addressed parenting in some way:

> 'Setting boundaries, challenging them [the parent] a little bit, in a nice gentle way about [the] sort of behaviours are they doing that aren't helpful for the child's weight … Um, so you know helping them to know that's it's OK to say "no" … They feel guilty about saying "no" … loads of praise … spending time with their kids so that their kids feel able to talk to them if things are worrying them. Um, so really the parenting things … we try to … reflect what might be said on a parenting course, I guess' (P08)

A lack of cooking skills amongst parents was mentioned a number of times, with dietitians having to tailor recommendations to improve family meals accordingly. Of further significance were parental education and literacy skills. Dietitians treated children with non-English-speaking parents, and parents with learning difficulties. More commonly:

> '… there are some parents who can't read as well, or can't write as well …' (P04)

Subtheme 1c: More satisfactory dietetic treatment requires more time (n = 7)

Dietitians who had shorter (initial 30 min; subsequent 15 min) appointments described their time with children and parents as rushed, frustrating and ineffectual. One extract describes the perception that more could be done to help children and families if more appointment time was available:

> '… I suppose have a bit more time to talk, rather than feel that you've got to rush it in 30 minutes, and being able to spend a little bit more time looking at resources and thinking about ideas rather than thinking, "Gosh we are coming to the end of 30 minutes, got to round it up here". And giving the child time to think a little bit more for themselves rather than trying to rush them on' (P02)

Some services acknowledged that certain families needed additional dietetic support and offered individualised 'education' appointments in which dietitians were able to spend more time providing advice on specific lifestyle-related problems:

> 'We do some education with some of the families … well, most of the families are offered the education and those slots are longer, so we would maybe offer three-quarters of an hour …' (P14)

Theme 2: Strategic balance of dietetic communication focus between child and parent in weight management consultations

The essence of this theme is the balance of dietetic views on parent and child roles in child weight management. These underlying philosophies affect dietetic communication within the consultation, whether the focus of the conversation is the child, the parent or both. The strategies they mentioned were not mutually exclusive and several dietitians referred to using more than one. Two of the 17 dietitians identified with all three strategies.

Subtheme 2a: Dietitian aims to communicate directly with the child (n = 11)

Dietitians felt it important to focus on involving the child in the conversation, but not to the exclusion of their parents:

> '… I do try and focus on the child as much as possible. I try and run everything past the parent if they are there and then if I set some sort of goals, or if the young person has come up with some sort of targets. I then ask the parent, "what do you think of these? Do they sound all right?". I do it that way, really' (P07)
>
> '… because although it's important to give the information to the parents, at the end of the day, it's the child that's got to do it [make the lifestyle changes]' (P06)

Subtheme 2b: Dietitian communicates with the parent and child in partnership (n = 9)

Six of the dietitians who prioritised communicating directly with the child also evidence a degree of partnership working with the parent. Four of these dietitians talked about this triadic conversation in the context of goal-setting only. The remainder (n = 5) conveyed a more pervasive ethos of working to engage the parent together with the child throughout the consultation:

> 'And, get the parents involved as much as possible as well. So, if they are overweight and they're not eating healthy, they need to say well … "OK, well why not do it all together?". And they look at their parents and go, "see?" and you see that interaction and you can see that, "well, if you want to do it, then do the reward chart together". And they do it all together. You can see a difference, when the parents go, "Well, we don't do as much physical activity as we could". And then they make that difference too. I find that really rewarding when I see the parents look at the children … and like, "Oooh, maybe we should do it too?"' (P04)

Subtheme 2c: Dietitian communicates with the parent to support the child (n = 5)

An emphasis on parental involvement characterised the third approach. Dietitians described supporting the parent to make the necessary changes that would in turn help the child to achieve a healthier weight:

> '… I would probably spend the majority of the conversation, in this age group, um, understanding the issues with the parent but including the child in that conversation where it was relevant. But I really feel, in this age group, that um very often it's the parent that needs to be supported to help the child to make changes. They haven't really reached the age, you know, a child doesn't want to do it … etc., etc, …. It's more about engaging the parents in change and them supporting the child to change' (P08)

These dietitians viewed their role as one of equipping and empowering parents in some way. Two dietitians invited only parents to most of their appointments. A third participant preferred parent-only consultations when a younger overweight child (i.e. a 7-year-old) had been referred.

Theme 3: Capacity to communicate affects the child's contribution in the dietetic consultation

Various child and parent dynamics affected how dietitians talked to the child within an appointment. This theme describes these factors as the degree to which the parent encouraged or hampered the child's communication, as well as child-factors: maturity, and interest in the conversation.

Subtheme 3a: Developmental stage of the child determines their ability to contribute (n = 10)

Cognitive development and ability, as well as emotional maturity, were seen to affect the preadolescent child's ability to communicate with the dietitian within an appointment setting. Younger children tended to need more help from their parents, purely because of their developmental ability. Younger patients were said to have limited communication skills, shorter attention spans, and there were concerns over the accuracy of the information they were able to provide. However, the point was made that age does not always reflect ability:

> 'I think it depends on [the child's] maturity because you can have a 7-year-old that is very able to chat and you can get an 11-year-old that … that isn't. So I think it completely depends on the child' (P09)

Subtheme 3b: Child willingness to be involved affects communication (n = 9)

Irrespective of their emotional, cognitive and communication capacity, the child would not take part in the conversation if they were unwilling:

> 'I suppose it depends on the engagement of the child, if that makes sense. So if there is a child that has been dragged along who doesn't really want to be there … it might be largely aimed at the parent. But if it's a child whose come there … I had [a patient] yesterday for example … a little girl … who was fully engaged and was really open, telling us why she was keen to change her weight and her lifestyle' (P02)

This theme was supported primarily by dietitians conscious of communicating with the child during an appointment (Subthemes 2a and 2b). The role of parental support was another area highlighted by these dietitians (n = 7).

Subtheme 3c: Parental support influences child participation (n = 8)

Dietitians pointed out that parents could affect the degree to which the child takes part in the conversation. Parental perception of responsibilities in addressing the child's weight plays a significant role in a parent's approach to the consultation. Some parents fail to recognise or acknowledge that their child is overweight, which affects their endorsement of the treatment process:

'... some parents ... if the child's a bit overweight, they just think it's puppy-fat, don't they? And they'll grow out of it ...' (P13)

Appointment time may be needed to talk to parents about this lack of concern in order to help gain their support for treatment. Exchanges about a parent who no longer lives in the family home but who has regular contact with the child, and who is responsible for providing some of their meals can take up minutes in the appointment. The child may also be left with less space in the conversation if the parent dominates the discussion:

'... I think if the parents talk over the child quite a lot ... I think it can affect the younger children ...' (P03)

Theme 4: Dietetic strategies for verbal communication with the child

This theme identifies the two main verbal strategies, used by dietitians, to include the young child into the conversation about their diet and physical activity levels. Dietitians described how they tried to use verbal discourse to first capture the child's attention, and then to make the content of the conversation both age-appropriate and relevant.

Subtheme 4a: Dietitian verbally engages the child in the conversation (n = 14)

Dietitians described how they tried to draw the child into conversation by finding topics that would interest them. To begin with, many dietitians pointed to the importance of initial greetings and introductions, of trying to talk to the child from the outset, building rapport with them and trying to alleviate some of the child's nervousness and apprehension:

'... "What have you been doing?". "How is school?". "What was your holiday like?". I usually put little things on my cards to say ... if they've said they're going on holiday or they're going away for the weekend or something, I'll always make a note of that ... It's building that rapport and that relationship with the kids that's the most important thing. And if you don't have that, then you're on a hiding to nothing, really' (P14)

The data indicated dietetic value in the child's perspective to ensure a common treatment agenda, particularly exploring the child's understanding of what the appointment was about. Dietitians also sought to make dialogue and explanations relevant to the child by establishing their overall goals, motivators and interests early on in the appointment:

'... I tend to pick out reasons that they [the child] will particularly like to focus on as reasons for wanting to ... change their lifestyle or change their appearance or looks. So we think about sports and clothes and ... just sort of general fitness ... how they would like to be in the future' (P02)

Subtheme 4b: Dietitian makes the conversation verbally accessible to the child (n = 15)

Many dietitians were aware that adult conversations about diet and lifestyle choices were largely inaccessible and irrelevant to preadolescent children. They were mindful of the words they used to communicate information and concepts to young children; they mirrored the child's use of language, adopting simpler age-appropriate words. Some dietitians also used familiar analogies:

'... if I don't need them [the child] to lose weight ... I just need them to not gain any more ... I use my analogy of the stretchy man. You know the little man in their party bags? I keep meaning to buy one actually, I just keep forgetting, but they all know what I mean ... I say to them, "You know when you get your stretchy man in your party bag, and you ... and he's short and he's quite wide ... then you pull him up and he gets really tall ... and much thinner?". And I say, "that's what I want you to do, so if you keep your weight the same, you're going to be like the stretchy man ... you'll grow taller and your weight will redistribute"' (P12)

Dietitians were specific about the information they asked of the child and provided to them, giving key messages that were 'simple' or 'basic', and talking to the child about aspects that were in their ability and control:

'I think if you can, rather than being vague about things ... if you can pinpoint, rather than just saying, "what do you tend to eat?" or "what things do you like?". I tend to say [to the child] "what have you eaten today?"' (P03)

'... when we're talking about going to school and their [the child's] class, I might ask them ... "do they have much time for lunch?" ... and "do they eat lunch with their friends?" ... and maybe, "what do they like to eat?". I might kind of say, "do they sometimes share things with their friends?". Sometimes their friend might bring in something and they might have a bit of it ...' (P16)

Theme 5: Features of resources that can support child communication

This theme brings together the characteristics of educational resources that supported dietetic communica-

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Theme 5: Features of resources that can support child communication

This theme brings together the characteristics of educational resources that supported dietetic communica-

tion with the preadolescent child. Two subthemes related to the appearance and content of resources. The third described how resources could be used as scaffolding for verbal exchanges between the child, the parent and the dietitian, forming the concrete basis for a conversation.

Subtheme 5a: Resources that appeal to the child can aid communication (n = 16)

Child-appeal was prioritised when describing useful resources. Certain design features were considered attractive to the preadolescent child. Fundamentally, most dietitians favoured picture-based over text-based resources, and suggested that text should be kept to a minimum. They described images as needing to be bright, colourful, and age-appropriate:

> 'But I think you have to be really careful with the graphics as well, so what you would give to an 11-year-old ... a young 11-year-old, I wouldn't give to an old 12-year-old ... Anything with cartoons on for a 12-year-old ... heading on 13 ... is starting to get a bit baby-ish, I think' (P08)

Elements of interactivity ($n = 11$) such as drawing, writing, and touching (referring to three-dimensional food-related models) were highlighted as being of interest to the 7–11-year-old child in dietetic appointments:

> '... [a good resource for children is] something that's quite hands-on for the kids because they do like to engage in quite a visual and hands-on way' (P02)

A variety of interactive games were mentioned by five dietitians who used them in group situations with preadolescent overweight children. The majority of them involved physical activity:

> '... the one [resource] I find more useful is a game which has got ... fats and sugars in foods. And we do that with like, uh, a packet of [sweets], and some [cola], and some crisps and things ... So, it's kind of still playing a game related to food. [Children] love that because they can guess, then they get to work it out, and they get to see that they are doing it right. It's just good fun, really' (P07)

Subtheme 5b: Useful resources help to make information more accessible to the child (n = 16)

As dietitians had attempted to make information verbally accessible to the child (Subtheme 4b), useful dietetic resources aimed to make information available in other ways. Familiar imagery, for example, was more likely to be identifiable and memorable:

> '... and for the children to know the food and recognise it, just something identifiable so they could see it again and recognise it, like the Eatwell Plate[1] is identifiable ... and people can see it again. And something that's going to hold in their brain, they remember' (P04)

Although, not all dietitians felt that the Eatwell Plate or other well-known resources were equally useful to the child:

> 'I just think that the Balance of Good Health and the Eatwell Plate Model for kids is complicated ... it's complicated for us, as adults' (P09)

The dietitians explained that messages should be conveyed in an age and ability-appropriate way:

> 'Yeah, [the resource is] meant to be aimed for the children to read themselves ... there is a lot of text in there and I think that probably it is only suitable for children who are ... the older end of your age group ... to be looking at really' (P13)

For 7–11-year-olds, resource content and text needed to be simple, clear and specific. It was pointed out several times that messages should be meaningful and relevant:

> '... and there [are] enough similar things. You know, there's a recipe for a pizza on [the Change4-Life Meal Planner resource], which I think it's made out of French bread, but you know it's simple and it's close enough to something that children might like' (P12)

Subtheme 5c: Resources can serve as a visual reference for the child, parent and dietitian (n = 17)

Resources were frequently referred to as scaffolding for the conversation, visually supporting verbal discourse. They were portrayed as a visual prompt or a point of reference that assisted the child, parent and dietitian in the communication process:

> '... the resource I use all the time ... no matter what...is the BMI [body mass index] chart ... and ... it actually shows if parents are like, "my child's not overweight", you can show: "Well this is a healthy weight. This is where your child is". And they are like, "woaw"' (P11)

Dietitians also talked about using information leaflets, or visual aids to illustrate more abstract points:

> '... it's things really, that people can relate to ... that are visual ... What I do sometimes take along to the one-to-one [appointments] ... [are]

[1]The Eatwell Plate is a pictorial representation of the main food groups and their recommended proportions for a general healthy diet. Developed by the Department of Health, it is widely used by health professionals across the UK.

the bean bags that say if you eat 2 biscuits a day … this is how much weight you will gain in a month … this is how [extra weight] creeps on and, you know, small [dietary] changes [can be significant]' (P17)

Others used list options that served as an educational tool to discuss specific changes, such as agreeing alternative main meal ideas or changes to school packed lunches. There was evidence that dietitians made use of simple diagrams and hand-drawn sketches to illustrate messages that they were communicate, or to clarify information:

'… sometimes I do sketches on my notepad, when we're [dietitian and child are] talking about portion sizes and I'll refer to the palm of my hand or the palm of their hand, when we're talking about slices … pieces of ham. "How much meat do you have?" and fruit and veg … and on my [note] pad I'm [drawing] … the [Eatwell Plate] … or a plate, as it shouldn't be, trying to gauge whether I've interpreted what they're saying about their meals correctly. You know, "is it that you're having half your plate covered in potato and the other half … your chicken, or meat and virtually no vegetables ?". And … just trying to … you know … use something other than just words …' (P13)

Several dietitians felt that a child-specific resource and handing it to the child conferred child-ownership and acknowledged their role in treatment.

Theme 6: Dietetic expectations for resources used in child weight management consultations

This theme highlights that resources also need to be useful to the dietitian, and also captures the features that dietitians value in a resource, as well as the fact that currently available educational resources could be improved.

Subtheme 6a: Resources should support individual dietetic practice (n = 11)

Dietitians looked for resources that complimented and supported their philosophy or approach to consultations of this sort. There were statements referring to needing to feel 'comfortable using' them:

'… I wish that they could have that portion resource without all of that other writing in it that's talking about losing weight because that doesn't go along with my message' (P09)

Subtheme 6b: Useful resources are tailorable and adaptable to reinforce specific messages (n = 11)

Dietitians valued flexibility within a resource; the ability to tailor a resource to the individual child (and their family) with a unique set of circumstances and in need of specific advice. Some dietitians appreciated a range of possibilities, presenting options that families could choose from:

'… the fact is that there [are] lots of suggestions … on the Meal Planners, you know … And there's bound to be something, there's always something that … that the child would like and they go, "oh yeah, I'll try that, yeah"' (P16)

Others preferred the freedom to provide information 'proportionate to change', in other words; specific information that supported those changes that had been agreed:

'… tailored to the individual. That's why I don't give out a lot of booklets because the nugget that that family needs is lost amongst all the other information …' (P08)

Many dietitians endorsed this theme when they referred to writing reminders of discussion in the form of agreed goals, tips and plans.

Subtheme 6c: Limitations of available dietetic resources (n = 10)

There was a general dissatisfaction with quality and range of dietetic resources currently available for child weight management:

'… I feel that we lack in our resources. I haven't really come across a resource that is amazing. I feel that we're kind of making do with resources … we use some of the Change4Life … well I try to use some Change4Life but even … that from a child weight management point of view, is quite limited' (P18)

This dissatisfaction has led to dietitians developing their own resources. Drawbacks associated with producing materials in-house were the initial time and costs involved, and the ongoing need for the content to be reviewed and updated as necessary. A number of dietitians felt that these sorts of leaflets and visual aids looked less attractive and:

'not half as professional …' (P14)

Dietetic attitude to the use of e-resources within child weight management consultations

Content analysis of responses to the question on the use of e-resources showed that only two dietitians made use of technology in children's outpatient appointments. One used computer-based images and another talked children and parents through an electronic presentation (although the latter was not for child weight management). Another dietitian had been involved in piloting a healthy lunchbox

e-resource in a school setting (also not specifically for overweight children). Five dietitians usually recommended that children and/or parents access certain websites for further relevant information after their appointment; three of these dietitians had not mentioned using technology in any other way. Two[2] dietitians suggested the idea of using e-resources to facilitate communication in the appointment, prior to the interviewer prompting for views on this.

Overall, dietitians (13/17) positively endorsed the concept of e-resources to facilitate face-to-face communication between child and dietitian using words such as 'great', fantastic', 'amazing', 'good' and:

> 'Yeah, no definitely, I think that would definitely be something that would be worth trying' (P06)

Reactions from three dietitians were categorised as neutral because they did not respond to the concept, either positively or negatively. However, two of these participants were interested in being involved in the resource design process. The response from one dietitian pointed out the logistical constraints:

> 'I suppose it's possibly more suited to somebody who's doing weight management all of the time because … I [have appointments with four or five children in a clinic] and they're not all … they're certainly not all weight management and they're certainly not all that age group either. So, by the time I've got my ipod out … iPad out and set it up, they probably wouldn't turn up …' (P12)

Discussion

By exploring dietitians' attitudes and experiences of talking directly to the 7–11-year-old in child weight management consultations, as well as the resources used to support face-to-face dietetic conversations, the present study sheds light on how dietitians approach communication in these appointments. There is consensus over dietetic strategies used to manage conversations with the preadolescent child, and the resource features that can support these conversations. These are important findings given the paucity of information currently available on the views of dietitians working with young overweight children and their families. Where dietitians differ is with respect to their view of the parent and child role in child weight management and therefore the extent to which the child should be involved in the consultation.

There is growing support for dietitians to adopt a patient-centred approach to child weight management consultations (Resnicow *et al.*, 2006; Stewart *et al.*, 2008). In the case of the overweight preadolescent child, there is less clarity over who the 'patient' is. NICE recommendations imply that the parent should be the focus of the consultation until the child reaches 12-years-of-age (NICE, 2013). This is interesting given that the majority of dietitians in the present study prioritised communication with the child. It is possible that some of the participants may have considered the interviewer to be 'an expert' in the field and their opinions influenced by questions being weighted towards child involvement. However, there was also a partnership style of working, in which dietitians valued the differing but complimentary roles of child and parent in the treatment process, an approach that also enables the preadolescent child to take on some of the role of 'patient'. Stewart *et al.* (2008) concluded that a child-centred approach to behavioural change could result in a type of partnership working between parent and child. Nevertheless, parents have a role to play in their own right, particularly amongst children of this age group where parents usually have greater control over the child's dietary habits. The impact of parental confidence and motivation to facilitate weight management in the preadolescent child should not be underestimated (Gunnarsdottir *et al.*, 2011). Indeed, some advocate for the parent to be the 'patient' because of their position to constructively influence and shape the child's eating patterns and other lifestyle behaviours (Golan & Weizman, 2001). In this model, the parent is supported to in turn support the child (Golan *et al.*, 2006). Although relatively few dietitians in the present study ($n = 5$) identified with this approach, there was an underlying recognition that parents are integral to the child's treatment.

Dietitians in the present study mentioned parental support as a factor that can affect the child's participation in the consultation. Considerable time can be spent helping parents to recognise that their child is overweight, and their parental responsibility for facilitating a health behaviour change, as well as dealing with the complexities of a split family. The potential for parents to dominate the conversation and inadvertently discourage the less confident or less able child is a fairly well documented (van Dulmen, 1998; Cahill & Papageorgiou, 2007; Coyne & Gallagher, 2011). Unlike Wassmer *et al.* (2004), who found that some parents were able to draw the child into the conversation by encouraging and supporting them to provide information, clinicians who took part in this research tended to talk about seeking to engage the child without parental support, possibly because these data came from dietitians who approached the consultation with the intention of involving the child in the conversation.

[2]The researcher (CR) had previously worked with one of these dietitians, during which time the idea of integrating technology into dietetic practice had been discussed.

Dietitians encountered a variety of strategies to include the preadolescent child in verbal discourse, many of which appear in an assessment tool used to assess dietetic behaviour change skills (Whitehead *et al.*, 2013). These data describe dietitians establishing rapport with the child from the beginning of the consultation, during the greetings and introductions, and continuing on to explore the child's interpretation of the reason for the referral, their motivators for achieving a healthier body mass index, and checking their understanding of the agreed goals. A two-fold approach emerged: dietitians first tried to engage the child in the conversation by talking about aspects of treatment that might interest them, and then made discussions accessible to them by using simpler age-appropriate language, asking focussed questions, talking about familiar and relevant concepts, and delivering key messages.

The design of helpful dietetic resources complimented these verbal tactics. Furthermore, all dietitians talked about how they routinely used leaflets, diagrams and other resources as visual scaffolding for the verbal discourse. Visual aids have been described as adding an extra layer of meaning (Gauvain & Cole, 1997) to otherwise abstract concepts such as 'portion size' and 'a balanced diet' (Ward-Begnoche & Thompson, 2008). Resources were mentioned as a way of not only supporting the child, but also the dietitian and parent exchanges. Remarkably, many key information features of resources highlighted as being important for the child (simplicity, clarity, memorability and relevance) were considered equally essential for parent communication aids. There is therefore a need for resources to support triadic communication so as to promote effective parent–child partnership.

Interactivity was mentioned as a design feature to attract the child and hold their attention. Drawing, colouring and touching were mentioned most often. Beyond the appointment setting, games were the favoured option. In one example, this game was a relay race with the aim of putting cereal boxes in order from lowest to highest sugar content. Typically, these activities weave specific nutrition and physical activity concepts into traditional children's game formats, reinforcing verbal dietetic messages. However, there was general agreement that these types of activities were not suited to the confines of an individual appointment environment.

There is an argument for bringing greater interactivity, in the form of play, into individual appointments with the preadolescent overweight child, which may enhance the communication of concepts, learning and adherence. Technology can offer this type of virtual learning environment (Rieber, 1996). Dietitians (n = 13) were interested in this concept and there were references to this type of resource encapsulating features that could support child–dietitian communication. Aside from the practical cost of software and equipment, the cost of changing clinical practice will be high. It will also take time for resources that suit all patient groups to be developed. However, it is important that a defined group is identified as a starting point, comprising children with the same health condition and of a similar age. This is to ensure that information and written resources are designed to be relevant, to suit the child's developmental age (Alderson & Montgomery, 1996; Mårtenson & Fagerskiold, 2008) and to meet the needs of their parents (Mikhailovich & Morrison, 2007; Hancock *et al.*, 2012).

Many dietitians were acutely aware of their role in facilitating effective patient-centred communication within the constraints afforded by the allocated appointment and, as reported by Whitehead *et al.* (2009), most dietitians felt that longer appointments were needed. In particular, dietitians in the present study perceived greater child involvement in these appointments took additional time.

Strengths and limitations

The researcher (CR), who conducted and analysed the interviews, had trained as a dietitian and worked in a child weight management service at the time of the study. The researcher's clinical knowledge and experience may have improved the richness of the data, enabling a greater depth of understanding of the issues encountered by participants. Conversely, over-involvement in the interview can threaten validity, and incorrect assumptions can lead to the misinterpretation of data (Jootun *et al.*, 2009).

The present study set out to analyse dietetic attitudes and approaches to communication with 7–11-year-old overweight children. Although the study attracted dietitians with differing professional experience, practising in a range of different child weight management services across the UK and Ireland, no dietetic assistants or dietetic practitioners contributed to these data. With dietetic support workers playing a greater role in dietetic care (NHS, 2013; BDA, 2013), their views would have provided a more holistic perspective.

Moreover, the present study was ambitious, setting out to understand the extent to which dietitians involved preadolescent children in weight management consultations, and the suitability of educational resources used to support behaviour change among children. To the best of our knowledge, this is the first study to begin to explore this area, with no starting point from which to work and no scoping guidance.

Coding is determined by the researcher's interpretation of the data (Braun & Clarke, 2006). Each researcher brings his or her own perspective and understanding to qualitative research (Draper & Swift, 2011). It follows that another researcher will inevitably interpret coded data from a different starting point. Examining the discrepancy

in agreement for the first independent coder further, it became apparent that percentage agreement for the Themes 1–3 was 91.7% but only 57.1% for Themes 4–6 (the latter arguably requiring more specialised dietetic knowledge to identify). Codebook revisions to descriptors for Themes 4–6 led to a small increase in agreement (64.3%) from the second independent coder.

Further research is needed to verify these themes. Repeating the present study from two separate approaches: one to look at child participation in the conversation and how visual aids compliment verbal interactions; and the other to explore the suitability of visual aids used within consultations and how they support behaviour change discussions. The exact nature and extent to which dietitians enable child involvement, and facilitate parental involvement in particular, was beyond the scope of the present study but warrants further investigation.

Conclusions

Several strong themes emerged from the present study, the most fundamental of which was the complex and sensitive nature of treating childhood obesity. In addition to focussing on communicating with preadolescent children, dietitians in the present study viewed parental support as integral to the preadolescent child's treatment. Emphasis on partnership working is needed to engage the child and parent in a nonthreatening way. Furthermore, helpful dietetic resources were described as those that complimented the verbal strategy of seeking to appeal to the child and then making information accessible to them. Therefore, perhaps unsurprisingly, these dietetic visual aids served as scaffolding for verbal exchanges between the child, the dietitian and the parent.

There is a need to facilitate triadic communication within the child weight management consultation. E-resources have the potential for greater interactivity between the dietitian, the overweight child and their parent within such an appointment. By its very nature, technology can be adapted to individual needs and circumstances necessary for health behaviour change (Krebs *et al.*, 2010), which is a flexibility that dietitians in the present study expressed a need for. Dietitians need to be involved in the development of e-resources if they are to be integrated into routine dietetic care (Raaff *et al.*, 2014). The study design would equally need to consider the communication requirements of child and parent.

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Conflict of interests, source of funding and authorship

The authors declare that they have no conflicts of interest.This review was undertaken as part of self-funded PhD study.
CR, CG and HW were involved in the study design. CR collected and analysed the data, and prepared the manuscript. CG and HW supervised the study. All authors critically reviewed the manuscript and approved the final version submitted for publication.

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Appendix 3. Article One published in Network Health Dietitians

CHILD WEIGHT MANAGEMENT APP - DOWNLOADING (PART 1 OF 3)

Designing an e-resource for clinical dietetic practice

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Carol has been a paediatric dietitian for nine years. She now works in a community-based weight management service, whilst researching the potential for e-resources to improve dietetic communication with this patient group.

Following substantial government investment (through initiatives such as the school food standards, Change4-Life and Play England), the prevalence of childhood overweight and obesity in the UK is showing signs of stabilising (1). It is important to regularly re-evaluate dietetic services to overweight children; are they as effective as they could be? Various child weight management strategies have developed to treat overweight children (including the commissioning of various specialist group and one-to-one child weight management services), but research shows that interventions need to be sustained (2) and encourage self-efficacy (3) in order to help children achieve and maintain a healthy weight.

Some progress is being made with adult populations, such as advances in the concept of motivational interviewing techniques, but detailed discussions with children about their treatment can prove more challenging (4), particularly pre-adolescents. Parental support is undoubtedly crucial for young children. Parents play a key role in forming family lifestyle habits and driving the shift towards change; setting boundaries, encouraging new behaviours, modelling healthier living, food purchases, budgeting, etc. However, some children would like to be more included in their treatment (5, 6). Furthermore, involving the child is a legal requirement (7). Fundamental to decision-making is how information about treatment is communicated (8).

Until now, group education sessions have led the way, introducing an element of fun through activity-based learning. An example of this is a relay race to rank the sugar content of popular drinks. The logistical limitations of a typical outpatient appointment, does not lend itself to these traditional game formats. Nevertheless, there is a case for bringing greater interactivity in the form of play into individual appointments as it may improve communication and learning (9).

E-resources have the potential for this type of interactivity (10). Recent research (11) with dietitians across the UK and Ireland, established that dietetic visual aids are used as scaffolding for verbal exchanges between the child, the dietitian and the parent. It also highlighted a mismatch between the available visual aids to support child weight management and those that dietitians would like to be able to use with their patients. Appropriately designed e-resources may provide the younger child with scaffolding for their conversations with the dietitian. In so doing, e-resources may improve understanding, involvement, motivation and the likelihood of compliance to lifestyle changes.

The challenge therefore, is to design an e-resource that meets the needs and expectations of children and dietitians. During the research, references to a range of resources were collected. Together with information about what dietitians are looking for in a useful visual aid, these resources provided a springboard to develop a framework for this new e-resource.

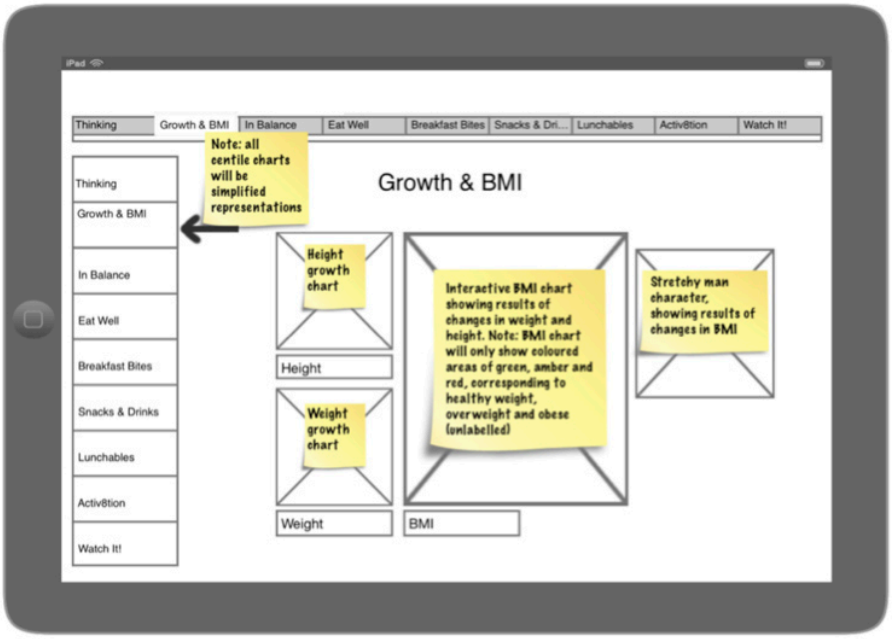
A total of nine sections, each representing concepts that dietitians generally aim to communicate to children

(and parents) during weight management consultations, were mapped out onto storyboards (Figure 1). Four sections were identified as fundamental to weight management and have become the first stage of the app development. The sections are:

1. Thinking
   - What 'healthy' means to the child
   - Healthy changes - enablers and barriers
2. Growth and BMI
   - Understanding growth charts
   - Weight maintenance vs continued weight increase
3. In balance
   - Introducing the concept of energy balance
   - Explaining calories
4. Eat well
   - The Eatwell Plate - an opportunity to discuss the sections and their nutritional value
   - Comparing the child's intake with the Eatwell Plate

Development of the app is currently underway, with the relevant storyboards being worked up into high fidelity interactive screens.

Fig 1: Storyboard to explain change in BMI (designed using Indeedo iMockups®)

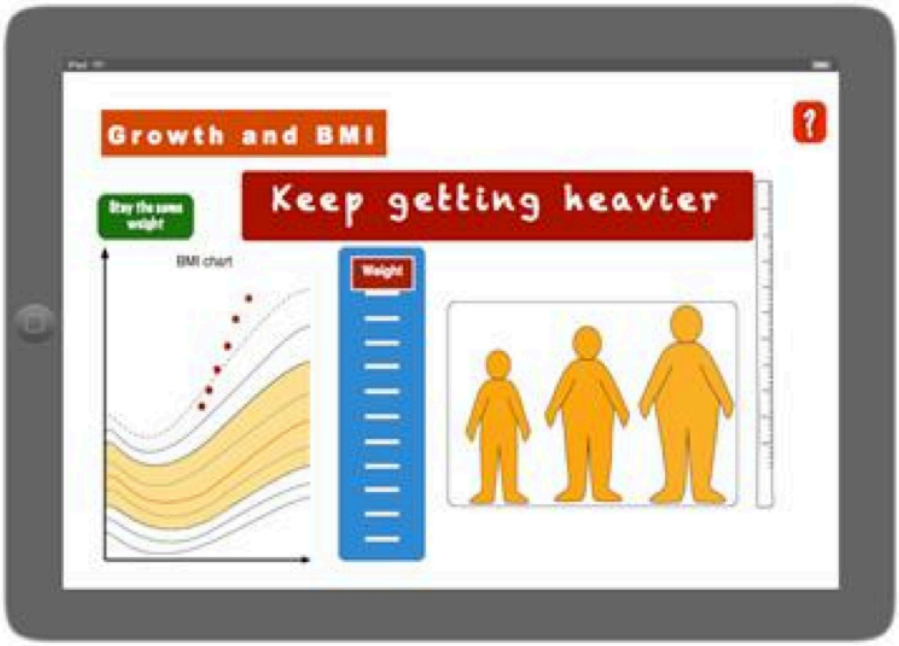


Translating paper-based storyboards into an e-resource is a challenging process. Some ideas, which originated from experience of using paper-based visual aids in day-to-day dietetic practice, needed to be distilled and then re-interpreted.

Taking the BMI example, some dietitians use growth charts as well as BMI charts to convey the effect of weight change on body shape, relying solely on charts to communicate understanding. The storyboard (Figure 1) shows how these charts were retained and a space added (on the right of the storyboard) to show changes in body shape over time. Rendering the storyboard into an electronic format highlighted the fact that three different charts on the same screen was both complicated and confusing.

Fig 2: Screenshot of Growth and BMI section - part 1 (designed using Tumult Hype®)

Fig 3: Screenshot of Growth and BMI section - part 2 (designed using Tumult Hype®)



A redesign of the BMI example replaced the weight chart with a slider to demonstrate changes to body shape over time - a horizontal slider for static weight and a vertical slider for increasing weight. Since a child has no direct control over their growth in height, the height chart was removed. The result is shown in Figures 2 and 3.

However, what may be deemed simpler and clearer to one dietitian may not necessarily be so for another. Development of any useful resource requires the involvement of stakeholders. Over the coming months, dietitians, seven- to 11-year-old children and parents, will be asked for their opinion and understanding of the various sections. Once complete, a feasibility study will measure the extent to which the e-resource improves dialogue between the child and dietitian, about treatment.

Your experience and opinion would help to shape the creation of the first dietetic e-resource of its kind. To view sections of the app, track its progress and contribute, visit http://dietitian-feed-back.weebly.com.

Abbreviations:
NCMP - National Child Measurement Programme

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Appendix 4. Article Two published in Network Health Dietitians

CHILD WEIGHT MANAGEMENT APP: DOWNLOADING PART 2 OF 3

Developing an e-resource for clinical dietetic practice

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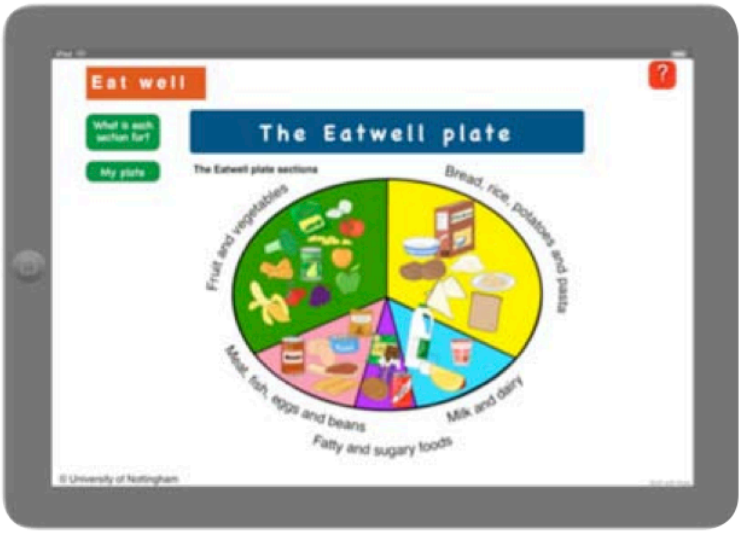
The first article in this series (1) set out the rationale for a child weight management e-resource to facilitate face-to-face discussions with pre-teens (7 to 11-year-olds) and described the approach to designing such an app. A blog is being used to enable dietitians to participate in shaping that design process. This article tracks the development of the app and highlights some of the initial dietetic feedback and contributions. At the time of writing this article, comments had been received for the first two sections: *Growth and BMI* and *Eat well*.

Growth and BMI attempts to simplify conversations around growth charts, BMI charts and consequences of the child continuing to gain weight versus maintaining their current weight. Children and families who attend clinic appointments tend to be subjected to hand gestures that attempt to annotate verbal descriptions of the effect of growth changes on BMI. The *Growth and BMI* section of the e-resource clearly illustrates the link between changes in BMI and body shape over time. *Eat well* provides a platform for discussing the sections of the Eatwell Plate and how the child's diet compares to the recommended Plate model.

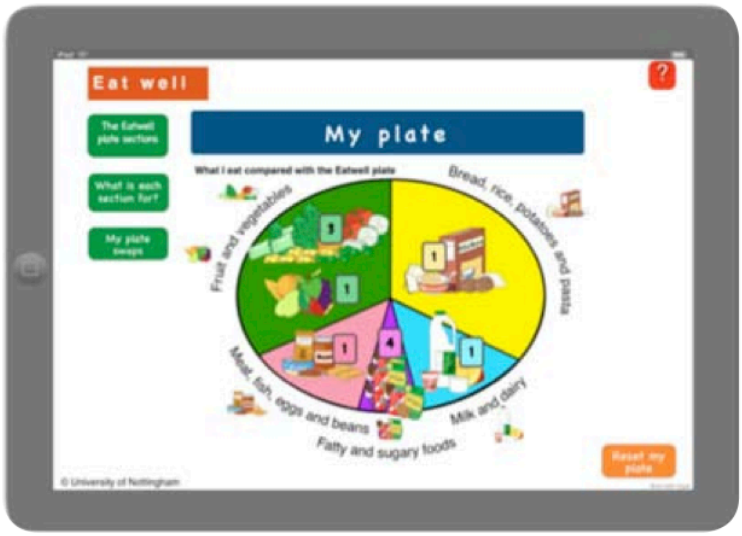
Initial reactions to both of these sections have been encouraging and constructive. Dietitians have responded positively, confirming that the basic concept for these sections has the potential to support dietetic child weight management consultations. Useful suggestions for improvements to interactive elements have also been offered (and gratefully received), and will be incorporated at the appropriate phase of this iterative development cycle.

Figure 1: An *Eat well* screen - the Eatwell Plate



Carol has been a paediatric dietitian for nine years. She now works in a community-based weight management service, whilst researching the potential for e-resources to improve dietetic communication with this patient group.

Figure 2: An *Eat well* screen - My plate - that enables the child to analyse a typical day's dietary intake in relation to the Eatwell Plate



A further two sections have been added to the app: *Time to think* and *In balance*. *Time to think* aims to open the discussion about what 'being healthy' means to the child. It explores the child's readiness and confidence to change and helps to identify barriers to lifestyle change. This section has proved to be the most challenging to design, most likely because of its origins in child psychology and individual views on how best to translate this into clinical practice.

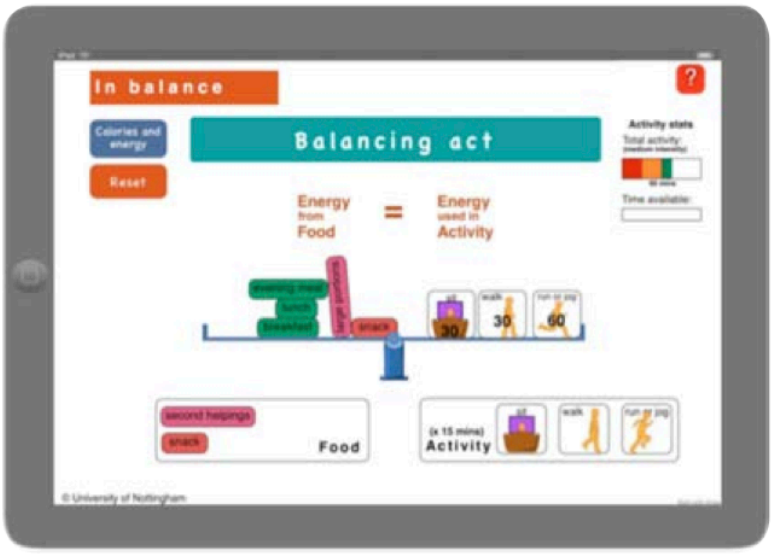
Figure 3: A *Time to think* screen - Being healthy means… - helping the child to identify and talk about, what being healthy means to them

Figure 4: A *Time to think* screen - Motivation and confidence rating scales

The concept of energy balance and conversations about calories are at least as demanding for different reasons and *In balance* helps to frame this dialogue.

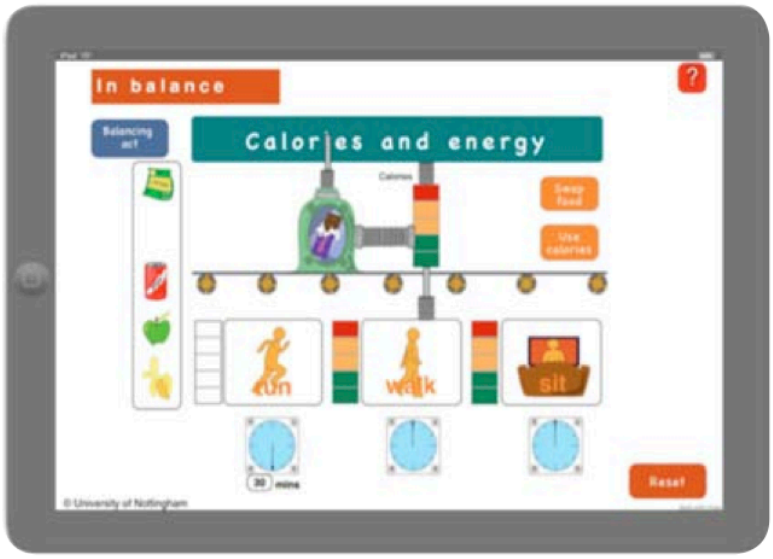
The first part - *Balancing act* - uses the familiar balance beam imagery, with 'energy from food' on the one side and 'energy used in activity' on the other. Aspects of energy balance that are typically avoided because they seem to add a degree of complexity and confusion, such as extra portions and large helpings, are dealt with in this section.

Figure 5: An *In balance* screen - *Balancing act* - showing energy balance



Most dietitians would choose not to explain calories to a child of this age. Nevertheless, it seems that more and more young children are aware of calories (perhaps having heard the term in the media, read it on food packaging, or overheard parent discussions). Simplifying terminology, that relies on knowledge about unseen energy particles, in such a way as to not encourage calorie-counting, is taxing. The second part of *In balance - Calories and energy* - analyses the relative calorie content of five different foods and then demonstrates how long it would take to use this energy whilst running, walking, or sitting.

Figure 6: An *In balance* screen - *Calories and energy* - illustrating the calories contained in a bar of chocolate



To view the four sections of this resource, please visit http://dietitian-feed-back.weebly.com. Dietetic comments and contributions will be combined with those from 7 to 11-year-old children and their parents to further refine this dietetic e-resource. Once developed, a feasibility study will gauge the extent to which the e-resource improves child-parent-parent treatment dialogue.

Reference
1 Raaff C (2014). Child weight management app - downloading part 1 of 3: Designing an e-resource for clinical dietetic practice. NHD 96: 38-41

Appendix 5. Article Three published in Network Health Dietitians

CHILD WEIGHT MANAGEMENT APP - DOWNLOADING PART 3 OF 3

Finalising an e-resource for clinical dietetic practice.

Carol Raaff
Paediatric Dietitian
Child Weight Management,
PhD Researcher
Staffordshire and Stoke-on-Trent Partnership NHS Trust

The previous two ***NHD*** articles introduced the rationale and design concept (1) and then documented the development phases (2). This article brings the app development to a close and offers a reflection on the process as a whole.

ADDING THE FINISHING TOUCHES

The final stages of development have included adding suggestions for how each screen could support dietetic practice (such as in Figures 1 and 2), providing ideas on how the app could be used with children and parents. Another finishing touch is the addition of sound. Sound can be distracting within a face-to-face consultation as it can interfere with the verbal discussion between the family and the dietitian. Care has therefore been taken to select short sound clips that compliment onscreen animations (3).

THE HIGHS AND LOWS OF DEVELOPING AN APP

This project has undoubtedly been a rollercoaster ride. To begin with, it took some time to get to grips with the software. I have limited experience of software coding that dates back to a point in time some 12-years ago and I am by no means competent in the field. As a result, the development platform that I used to animate the images and create interactivity was selected, in part, because of the claim: 'no coding required'. Unfortunately, it quickly became apparent that while this is true for simple animations, for the other half of the app to work, I would need to grapple with Javascript. This was daunting, and at times almost overwhelming.

The software wasn't the only thing that presented a challenge; I also needed to learn how to create successful interactive animations. Having laboured for several weeks over the structure of the first few screens, I presented my efforts to my supervisors who were very encouraging and helpfully gave me the following advice: "make use of the technology". It made me rethink my designs, so as to capture the essence of the message both simply and interactively, making use of opportunities for the user (or patient) to be in control. My first NHD article (1) contains my design journey of the Growth and BMI section of the app, which illustrates this point further.

As with anything, however, having mastered a tool, the more competent you become at using it, the more success you have at what you are able to create. It is incredibly rewarding to bring an idea to life, finally getting an interaction to work after days or weeks of wrestling with it.

TIPS AND ADVICE

Several dietitians have told me that they have been thinking about undertaking a similar project, so I thought it would be useful to share some of what I have learnt.

IMAGES

It may seem obvious to some, but all of the images used in an app need to be created or purchased. Drawing your own is possibly cheaper, but it does cost you time (it took me approximately four weeks). What you gain is greater control over the style of your app, consistency (purchasing different images from different sources can lead to an incoherent

Carol has been a paediatric dietitian for nine years. She now works in a community-based weight management service, whilst researching the potential for e-resources to improve dietetic communication with this patient group.

Figure 1: Suggested instructions for clinicians - a Time to Think screen

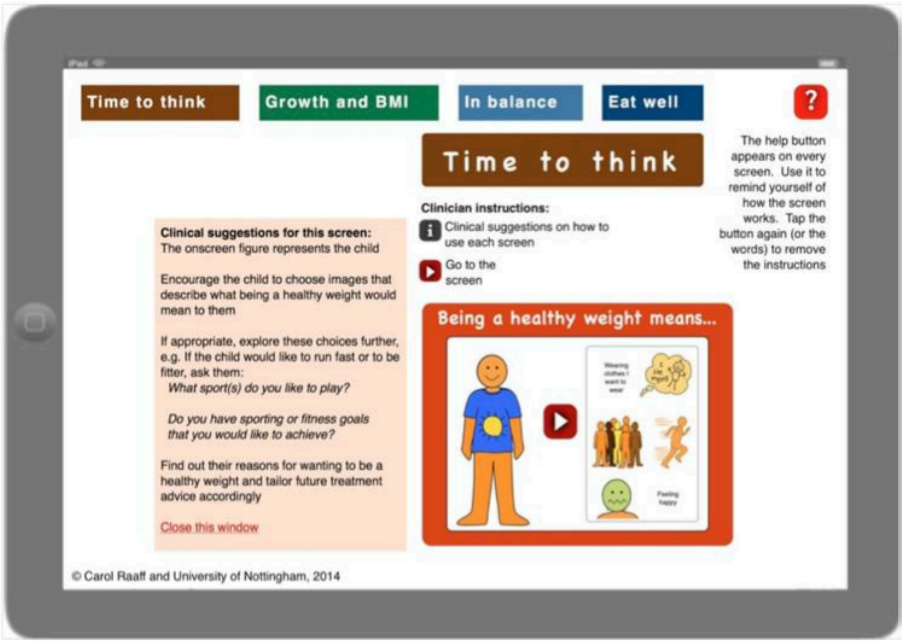
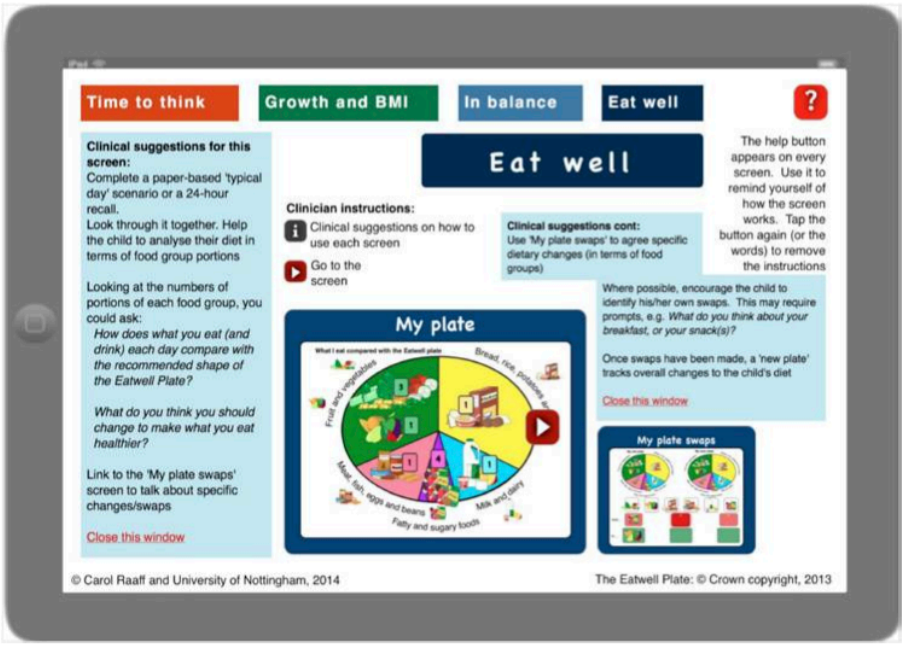


Figure 2: Suggested instructions for clinicians - an Eat Well screen



Designing an app from scratch, without other points of reference, can be professionally challenging. Having one or two other interested dietetic colleagues for support is invaluable.

and less professionally finished product), and the freedom to customise the images to what is needed in your animations. Having researched the most efficient way, I found that vector images can be created rapidly, altered easily and reused.

DEVELOPMENT PLATFORM

Choosing an appropriate development platform - used to create the app in - is important. I considered four aspects: ease of use, functionality across all web browsers (HTML5 and CSS are the accepted standard for building Internet-enabled content (4)), purchase price and how it could be packaged into a downloadable app.

Once the hard work has been invested into the development, making the app available on an app store is costly and it would be worthwhile getting professional advice on the options available before embarking on the project.

FEEDBACK

Designing an app from scratch, without other points of reference, can be professionally challenging. Having one or two other interested dietetic colleagues for support is invaluable. These are the people you can go to for ongoing feedback, who will tell you when you are hitting the mark (and when you are missing it by a mile). Depending on the dietetic speciality, it may be necessary to form a multidisciplinary team, including clinicians with relevant skills and expertise, e.g. specialist nurse or paediatrician.

Inviting wider professional collaboration is both clinically important (5) and ethical (6). This could be done in several ways: focus groups, carefully crafted online questionnaires, or you may wish to set up a blog (e.g. http://dietitian-feedback.weebly.com) to provoke wider discussion, suggestions and comments. Specific questions offer guidance to those accessing the blog, enabling helpful feedback on specific design aspects.

TESTING OUT THE APP

Testing the app with the intended patient group is important. In theory, this can be done at any stage, but is probably most helpful towards the end, when there is something to see and interact with (and the app is in its intended format). Initial testing should be done with non-patient peers of the patient group and then with patients themselves (6). Final testing with patients will need agreement and support from your employer (or relevant organisation).

NEXT STEPS

A feasibility study is being planned to gauge the extent to which the app improves child-dietitian treatment dialogue. Effective e-resources may serve as scaffolding to the younger child, for conversations they have with the dietitian. This may in turn improve understanding, involvement, motivation and even compliance to lifestyle behaviour change (1). My hope is that we would begin to develop and research apps for other areas of dietetic practice and, in so doing, improve treatment options for our patients.

References
1 Raaff C (2014). Child weight management app - downloading part 1 of 3: Designing an e-resource for clinical dietetic practice. NHD Magazine. 96: 38-41
2 Raaff C (2014). Child weight management app - downloading part 2 of 3: Developing an e-resource for clinical dietetic practice. NHD Magazine. 97: 38-41
3 Najjar LJ (1996). Multimedia learning and information. J Ed Multimed HyperMed. 5(2): 129-150
4 W3C (2013). Web designs and applications. Available at: www.w3.org/standards/webdesign [accessed 9 October 2014]
5 HCPC (2012). Standards of conduct, performance and ethics. London, Health and Care Professions Council
6 Doherty G, Coyle D, Matthews M (2010). Design and evaluation guidelines for mental health technologies. Interact Comp. 22(4): 243-252

Appendix 6. *Feed-back* e-resource blog

Designing an e-resource for child weight management

HOME | TIME TO THINK | GROWTH AND BMI | IN BALANCE | EAT WELL | CONTACT ME

Childhood Obesity Study Day

19/09/2014 — 0 Comments

Lovely to meet you all at the DOM UK and Paediatric Group Study Day. Thank you for taking the time to take a leaflet and/or a questionnaire. For those of you who didn't take a questionnaire, and would like to contribute, you can download a form here:

My postal address:
Springfields Health and Wellbeing Centre
Off Lovett Court
Rugeley
Staffordshire WS15 2QD

Alternatively, please email the questionnaire back to me. Looking forward to receiving your comments. Thank you!

Tweet 0 Like 0

Add Comment

We have sound!

16/09/2014 — 0 Comments

Thank you for all the comments and suggestions I have received so far. They have been useful in helping me to make adjustments and improvements. The other thing I have done is to add sounds* to various buttons and actions (hopefully making it more appealing to use).

The most up-to-date versions are now available on the blog. Please let me know what you think.

*Sound files have been sourced from http://www.freesfx.co.uk

Tweet 0 Like 0

Add Comment

Feed-back...a title?

29/07/2014 — 4 Comments

Author:

Carol Raaff

I work part-time as a paediatric dietitian in a child weight management service. What is left of my weekdays is spent researching. Weekends are for friends and family (my wonderful husband and two children - aged 10 and 8). I have good intentions about keeping fit, but the reality is that I am physically active less often than I would like to be (and I have a weakness for chocolate).

Archives

September 2014
July 2014
May 2014

Categories

All

RSS Feed

Choose a section:

The e-resource is coming together nicely and above my first attempt at designing a main menu. I am also thinking of using the name *Feed-back* for the app/e-resource. Hopefully, the technical problems (inability to access e-resource sections from NHS computers) have been resolved.

Please do make suggestions (on any aspect). I would be glad to have your thoughts.

Tweet 0 Like 0

4 Comments

Resolving technical problems

10/07/2014 0 Comments

Apologies to those of you who tried to view sections of the e-resource on NHS computers and found the app un-view-able. It has taken me a number of weeks to sort out, but I think I have finally solved the problem. I have noticed that the download may be slow (for technical reasons that I will only be solved when the e-resource is available as a fully-fledged app), but I am hopeful that you will be able to see and interact with the actual e-resource, rather than simply view the screen images at the top of each of these blog pages.

Please let me know if you encounter any problems, and I will address them as best I can.

I have also completed all four sections of the e-resource. They are available through new pages of this blog. Please don't forget to leave your feedback

Tweet 0 Like 0

Add Comment

Welcome

10/05/2014

Thank you for taking the time to visit this site. The purpose of this blog is to share ideas in order to design and develop a useful e-resource for dietitians to use in child weight management appointments.

The various sections will be added and updated over the coming months, shaped by your comments and input.

Key facts about this e-resource:

- An electronic visual aid, designed for ipads and android tablet devices (but could be used on a PC or laptop)
- For dietitians to use in one-to-one conversations with overweight children
- Intended for 7 to 11-year-olds

Tweet 0 Like 0

Designing an e-resource for child weight management

HOME | TIME TO THINK | GROWTH AND BMI | IN BALANCE | EAT WELL | CONTACT ME

Time to Think

Clinical instructions

View screens

Time to Think is about starting discussions about the child's thoughts on:

- Being a healthy weight
- What is important to them
- Where they would rate their own motivation and confidence to achieve a healthy weight, and
- The challenges and difficulties they face to achieving healthy lifestyle changes

It is intended as an interaction tool, adaptable to different children and used in a variety of combinations (dependent on the child and their treatment needs). Click here to download this section of the e-resource.

This section is probably the most difficult to design, and your comments and suggestions would be gratefully appreciated. If you find that the 'poll' below is too restrictive, please feel free to drop be an email or fill in the Contact me section with your feedback. Thank you.

Specific suggestions / comments about the 'Being a healthy weight means...' screen. I think that it is:

- Good the way it is
- Not good at all
- Could be improved - Please specify your comments in the 'Other' section below
- Other:

Vote

Polldaddy.com

Would the Time to Think set of screens suit your clinical practice?

- Yes
- No
- Maybe / I have a comment - Please post your comments in the 'Other' answer below
- Other:

Vote

Polldaddy.com

Are the illustrations helpful? Do they capture what children tend to tell you in your consultations?

- Yes
- No
- Some of them - Please make your suggestions in the 'Other' section below
- Other:

Vote

Polldaddy.com

Specific suggestions / comments about the 'When it's difficult' screen. I think that it is:

- Good the way it is
- Not good at all
- Could be improved - Please specify suggestions in the 'Other' section below
- Other:

Vote

Polldaddy.com

Specific suggestions / comments about the 'Rate yourself' screen. I think that it is:

- Good the way it is
- Not good at all
- Could be improved - Please specify suggestions in the 'Other' section below
- Other:

Vote

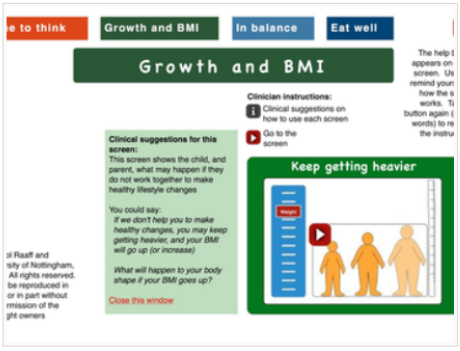
Polldaddy.com

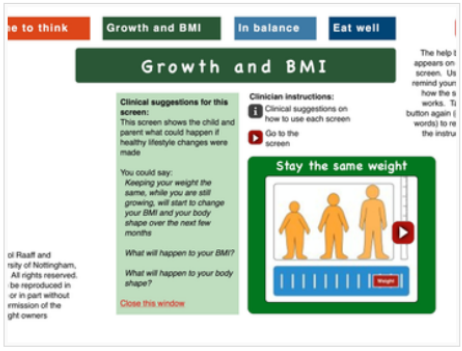
Designing an e-resource for child weight management

HOME | TIME TO THINK | GROWTH AND BMI | IN BALANCE | EAT WELL | CONTACT ME

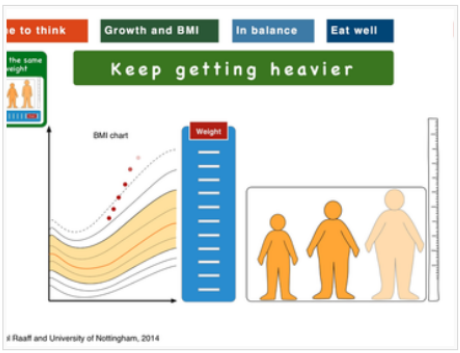
Growth and BMI

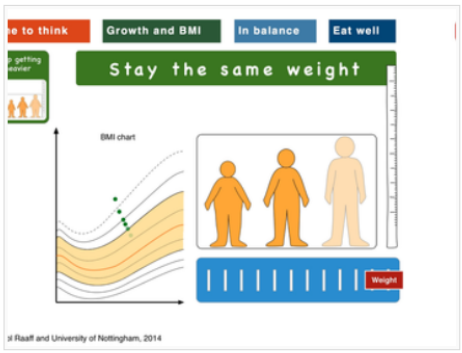
Clinical instructions





View screens





Design history:

Changes in BMI are usually explained using growth and BMI charts. However, graphs are both complex and abstract. The first attempt at designing this section used all three charts: weight, height and BMI. However, the result was complicated. This current version has been simplified.

Click here to download the section and see how it works.

Aims:

To communicate the:

1. Link between BMI and change in body shape over time
2. Consequence of not making lifestyle changes (i.e. allowing weight to continue to increase)
3. Result of keeping weight static

Please take a few moments to submit feedback about the Growth and BMI section of the app:

Is this Growth and BMI section easy to navigate, and work your way around?

- Yes
- No
- I think the navigation/screens could be improved - Please add your suggestions to 'Other' below
- Other:

Vote

Polldaddy.com

Do you think the images and graphics are appropriate for preadolescent children?

- Yes
- No
- Mostly - Please add your comments to 'Other' below, e.g. appeal-factor, clarity, colours, layout, etc.
- Other:

Vote

Polldaddy.com

Would this Growth and BMI section suit your clinical practice?

- Yes
- No
- Unsure - Please suggest improvements (not already mentioned) in 'Other' below
- Other:

Vote

Polldaddy.com

All Forums

Members | Sign In with weebly or other account (facebook, twitter, ...)

Sign In with weebly or Sign in with Facebook

2 forums

News *Community news*	0 posts
Off-topic *All things off-topic*	0 posts

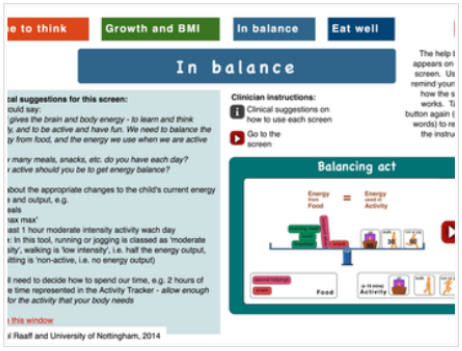
New Members (1 total members)

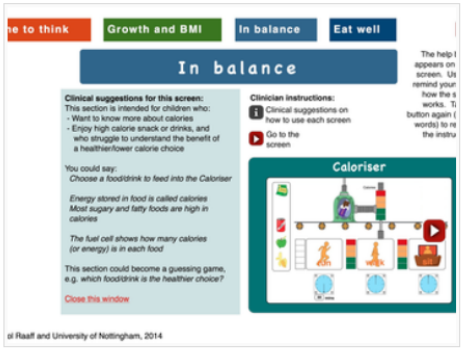
See all

Designing an e-resource for child weight management

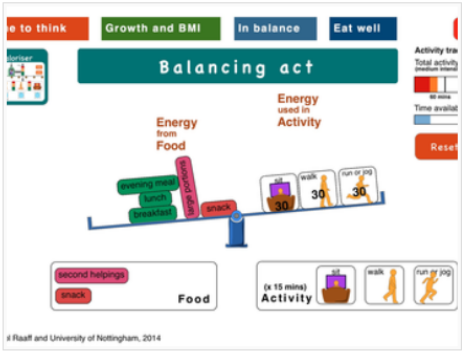
In Balance

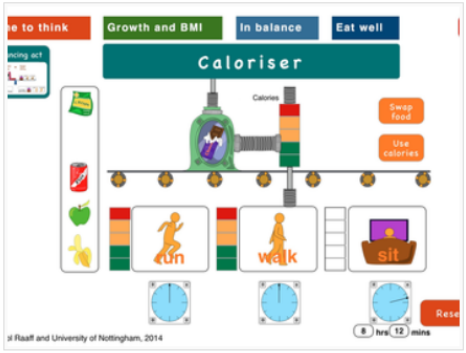
Clinical instructions





View screens





This part of the app consists of two sections - **Balancing Act** and **Caloriser**. It is intended as a teaching aid, to demonstrate energy balance, and the relative calorie content of selected foods (and how these can be used during different types of physical activity).

Click here to download this section of the e-resource.

Balancing Act is based on the familiar balance-beam concept, with 'energy in' on one side and 'energy out' on the other. The analogy is taken a step further by providing the option to add:

- several snacks, 'large' food portions, and/or second helpings at mealtimes, as well as
- different types of physical activity (and for differing lengths of time)

Both of these would enable the child and dietitian to explore energy intake and expenditure in greater detail. The 'activity tracker' in the top right hand corner of the screen makes the child think about how they will choose to spend their allocated 2 hours of leisure time - using a combination of sitting, walking or running.

Calories and Energy is an attempt to explain calories to children seeking an explanation. Five food items - a chocolate bar, packet of crisps, can of sugary fizzy drink, apple or banana - can be analysed in the 'caloriser' to illustrate relative calorie content, followed by a choice on how this energy can be used in activities - running, walking or sitting.

If you find that the 'poll' below is too restrictive, please feel free to drop be an email or fill in the Contact me section with your feedback. Thank you.

Does the Activity Tracker (on the Balancing Act page) work as a concept?

- Yes
- No
- Possibly, with improvements - Please make suggestions in the 'Other' section below?
- Other:

Vote

Polldaddy.com

Would this In Balance section suit your clinical practice?

- Yes
- No
- Possibly, with improvements - Please make suggestions in the 'Other' section below?
- Other:

Vote

Polldaddy.com

Does the Calories and Energy ('Caloriser machine') work as a concept?

- Yes
- Yes, with improvements - Please leave your suggestions in the 'Other' box below
- No - Please provide your comments in the 'Other' box below
- Other:

Vote

Polldaddy.com

What are your thoughts on the tipping points of the balance-beam on the Balancing Act page?

- Good the way it is
- Not good at all - Please provide suggestion in the 'Other' section below
- It is OK, but could be improved - Please leave your suggestions in the 'Other' section below
- Other:

Vote

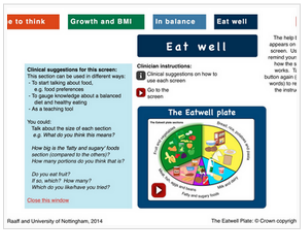
Polldaddy.com

Designing an e-resource for child weight management

HOME | TIME TO THINK | GROWTH AND BMI | IN BALANCE | EAT WELL | CONTACT ME

Eat Well

Clinical instructions



View screens

Design history:

The Eatwell Plate is widely used by dietitians across the UK. As yet, this section has not undergone much change.

Click here to download the section and see how it works.

Aims:

1. To present an interactive version of the Eatwell Plate
2. To educate on the health-value of each of the food groups
3. To provide an opportunity to talk about how the child's 'plate' compares with the Eatwell Plate, when used in conjunction with a paper-based version of the 'typical day scenario'
4. To provide an opportunity to talk about and agree swaps to the child's 'plate'
5. To see how making these agreed swaps alters the child's 'plate'

Please take a few moments to submit feedback about the Eat Well section of the app:

Could this Eat Well section help you to explain and use the Eatwell Plate?

- Yes
- No
- Possibly, with improvements - Please make suggestions in the 'Other' section below?
- Other:

Vote

Polldaddy.com

Do you think the images and graphics are appropriate for preadolescent children?

- Yes
- No
- Mostly - Please add your comments to 'Other' below. It would be useful to have specific feedback on the 'Uses of the Eatwell Plate' section, i.e. images used and choice of identified uses
- Other:

Vote

Polldaddy.com

Is this Eat Well section easy to navigate, and work your way around?

- Yes
- No
- I think the navigation/screens could be improved - Please add your suggestions to 'Other' below
- Other:

Vote

Polldaddy.com

Would this Eat Well section suit your clinical practice?

- Yes
- No
- Possibly, with improvements - Please make suggestions in the 'Other' section below?
- Other:

Vote

Polldaddy.com

Designing an e-resource for child weight management

HOME | TIME TO THINK | GROWTH AND BMI | IN BALANCE | EAT WELL | CONTACT ME

My contact details:

Carol Raaff
mcxcar@nottingham.ac.uk

Thank you for your feedback.

Contact me

Name *

First Last

Email *

Comment *

Submit

Appendix 7. *Feed-back* poster presentation

Feed-back:
An e-resource for child weight management

Background:

There are calls to innovate weight management interventions. Technology used to enable and enhance face-to-face consultations with dietitians offers a fresh perspective.

Purpose:

Feed-back is an electronic visual aid, to provide scaffolding for communication. Intended use:

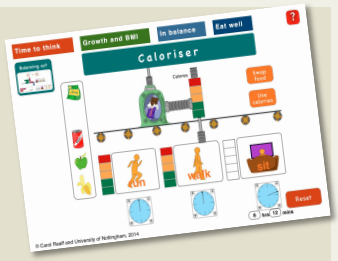
- Overweight 7 to 11-year-olds
- Dietitians (potentially other relevant health professionals)
- One-to-one appointments
- Tablet device (preferable), PC or laptop

Design:

Four interactive sections:

- **Time to Think** – Discussion-openers, i.e. what being a healthy weight means, barriers to change, etc.
- **Eat Well** – The Eatwell Plate and how the child's diet compares

- **In Balance** – Explains Energy balance and the concept of calories



- **Growth and BMI** – Links BMI and change in body shape over time

Future plans:

To evaluate:

- Potential to improve child-dietitian communication within child weight management consultations
- Effects on treatment outcomes

What is your feedback?

Please try the e-resource and offer your comments and suggestions. **Thank you.**

Carol Raaff – mcxcar@nottingham.ac.uk

Paediatric Dietitian – Child weight management, Staffordshire and Stoke on Trent Partnership NHS Trust

Staffordshire and Stoke on Trent Partnership NHS Trust

PhD Researcher – Division of Psychiatry and Applied Psychology, University of Nottingham

The University of Nottingham UNITED KINGDOM · CHINA · MALAYSIA

http://dietitian-feed-back.weebly.com

Appendix 8. Systematic review search terms (Chapter Two)

Ovid MEDLINE(R) 1946 to April week three 2012 search strategy

1. (appointment$ OR consultation$).tw,kf
2. Health Communication.sh
3. (health ADJ3 communicat$).tw,kf
4. OR/ 1-3
5. (e-communicat$ OR ecommunicat$).tw,kf
6. (e-health OR ehealth).tw,kf
7. electronic$.tw,kf
8. virtual.tw,kf
9. Virtual Reality.sh
10. (virtual ADJ reality).tw,kf
11. (Hypermedia OR Multimedia).sh,tw,kf
12. animation.tw,kf
13. ((information ADJ technolog$) OR IT).tw,kf
14. (Decision Making, Computer-Assisted OR Therapy, Computer-Assisted).sh
15. (computer ADJ (assisted OR based OR mediated)).tw,kf
16. (Computers OR Computers, Handheld).sh
17. (computer$ OR (hand ADJ held ADJ3 computer$) OR (handheld ADJ3 computer$)).tw,kf
18. (mobile ADJ communic$).tw,kf
19. ((personal ADJ digital ADJ assistant) OR pda$ OR (pocket ADJ pc) OR (pocket ADJ computer$)).tw,kf
20. ipad$.tw,kf
21. Internet.sh,tw,kf
22. World Wide Web.sh
23. ((world ADJ wide ADJ web) OR www OR website$ OR (web-site$) OR (web ADJ based) OR (web-based) OR webbased).tw,kf
24. Online Systems.sh
25. (online OR on-line OR portal).tw,kf
26. Compact Disks.sh OR CD-I.sh OR CD-ROM.sh
27. ((cd ADJ rom$) OR cd-rom$ OR cdrom$).tw,kf
28. Software.sh,tw,kf
29. (interactive ADJ3 (technolog$ OR application$ OR program$) OR ITA).tw,kf
30. Video Games.sh
31. ((video OR computer) ADJ game$).tw,kf
32. (wii OR nintendo).tw,kf
33. OR/ 5-32
34. Pediatrics.sh
35. (p*ediatric OR p*ediatrics).tw,kf
36. Child.sh,tw,kf
37. (children OR childhood).tw,kf
38. OR/ 34-37
39. (Diet OR Diet Therapy OR Nutrition Therapy).sh
40. (diet$ OR nutrition$).tw,kf
41. (Health Education OR Patient Education as Topic).sh
42. (health ADJ education).tw,kf
43. Health Promotion.sh
44. ((health ADJ promotion) OR (promot$ ADJ health)).tw,kf
45. Patient Participation.sh
46. exp Patient Compliance.sh *(includes Medication Adherence/)*
47. Motivation.sh
48. motivat$.tw,kf

49. exp Attitude to Health.sh *(includes Health Knowledge, Attitudes, Practice/, Patient Acceptance of Health Care/)*
50. Self Efficacy.sh
51. (self ADJ efficacy).tw,kf
52. (health ADJ competence).tw,kf
53. Health Behavior.sh
54. ((health ADJ behavi*r$) OR (chang$ ADJ3 behavi*r$) OR (behavi*r$ ADJ3 change$)).tw,kf
55. exp Self Care.sh *(includes Blood Glucose Self-Monitoring/, Self Administration/ and Self Medication/)*
56. (self ADJ manag$).tw,kf
57. exp Patient Satisfaction.sh *(includes Patient Preference/)*
58. OR/ 39-57
59. Randomized Controlled Trial.sh
60. Randomized Controlled Trials as Topic.sh
61. (randomized controlled trial).pt
62. (controlled clinical trial).pt
63. Random Allocation.sh
64. Double-blind Method.sh
65. Single-blind Method.sh
66. OR/ 59-65
67. Animals.sh NOT Humans.sh
68. 66 NOT 67
69. (clinical trial).pt
70. exp Clinical Trial.sh *(includes Clinical Trial, Phase I/, Clinical Trial, Phase II/, Clinical Trial, Phase III/, Clinical Trial, Phase IV/, Controlled Clinical Trial/, Multicenter Study/ and Randomized Controlled Trial/)*
71. Case-Control Studies.sh
72. (clin$ ADJ25 trial$).tw,kf
73. ((single OR double OR triple OR treble) ADJ25 mask$).tw,kf
74. Placebos.sh
75. (placebo$ OR random$).tw,kf
76. Research Design.sh
77. OR/ 69-76
78. 77 NOT 67
79. 78 NOT 68
80. (Comparative Study OR Evaluation Studies OR Follow-Up Studies OR Prospective Studies).sh
81. (control$ OR prospectiv$ OR volunteer$).tw,kf
82. intervention$.tw,kf
83. OR/ 80-82
84. 83 NOT 67
85. 84 NOT (68 OR 79)
86. 68 OR 79 OR 85
87. 4 AND 33 AND 38 AND 58 AND 86
88. limit 87 to yr=1990-2012
89. exp Schools.sh *(includes Schools Medical/, Schools Nursery/ and Universities/)*
90. Vocational Education.sh
91. 88 NOT (89 OR 90)

Appendix 9. Semi-structured telephone interview schedule (Chapter Three)

Aim 1: To explore *experiences / views / opinions on communicating* directly with 7 to 11 year old children and the degree to which they involve children in the structure of paediatric weight management appointments.

Aim 2: To explore *resources* used with children and families, who the resources target and views on suitability / usability of these resources.

1. Introduction

General introduction
- Is it convenient to talk? / Have I caught you at a good time?
- Is this a good line? Can you hear me clearly?

Personal introduction
- Paediatric dietitian and PhD researcher

Recap purpose of the study and what will happen in this interview:
- Experiences and views on communicating with preadolescents and resources that you may use with these children
- Interview will be recorded and then transcribed. Identifying data will be removed and stored in a password-protected file. I will be making brief notes during the course of the interview
- Last about 30 minutes. Is there a set time that you need to finish by?
- Do you have any questions about the study or this telephone interview?
- Would you mind if we started the interview?
- Please feel free to stop me or ask me to clarify questions as we go along
- I am going to switch the dictaphone on now

Start recording

2a. Demographic information – general

- Would you mind if I asked you some questions about your professional role and paediatric experience?
  …to begin with…
  - Which area of the country do you work in?
    England *Wales* *Scotland* *Other*
  - What year did you qualify in?
  - How long have you been working in paediatrics?
  - How long have you been working with overweight children?
    <1 y *1-3 y* *4-6 y* *7-10 y* *>10 y*
  - Job title?
    Dietitian or dietetic assistant?
  - No. hours that you work in paediatrics each week?

2b. Demographic information - your child weight management service

The next few questions are about how child weight management fits into your work role and the context for the service you provide. (I appreciate that your answers may be fairly generalised.)

- Can you tell me a little bit about your child weight management service?
  - On average, how many 7 to 11 year olds do you see each week?
    <1 1 or 2 3-5 6-10 10-20 >20
  - Do you see children (and their families) in individual appointments?
  - Do you also see children in group sessions?
  - What proportion of your time would you say you spend on individual appointments (with children their parents/families) and what proportion do you spend in group sessions?

3. Talking to 7 to 11 year old children and their families

…within one-to-one appointments with children (with or without their parents)…

- What is your experience of involving 7 to 11 year olds in an appointment?
  - When does it work well?
  - When does it not work well?
  - Is it practical?
  - Is there anything that you find particularly difficult?
  - Are there any barriers?

- How do you involve children in conversations?
  - Do you find certain words or phrases helpful?
  - Do you use visual aids or information leaflets to explain concepts?
- If you were to think of a 'typical' appointment with an overweight child…can you tell me how you tend to divide your time between the child and his/her parents?
  - Who do you get your information from?
  - Who do you direct your questions at?
  - Who do you tend to direct diet-related advice to?

4. Resources that you use to communicate with children and their families

Thinking about a 'typical' appointment…

- Do you tend to use visual aids, information sheets, food models or diagrams to gather or convey information
- Could you describe or possibly even name some of the resources you find helpful?
  - Who do you tend to use them to communicate with? Children or parents or both?

    e.g.: Gather lifestyle information, e.g. food diaries, activity diaries?
    Clarify information, e.g. food portion size illustrations or descriptors?
    Meal or snack ideas?
    Drinks?
    Action plan?
- Can you put your finger on what makes a resource useful?
- Are there any that you have used that you have found less helpful? Why?
- Who do you hope will read or look at the information you give out? Who do you think actually reads it?

5. Closing questions

- Are you satisfied with how much you involve children during their appointments?
- In your opinion, could anything make diet-related conversations with 7 to 11 year old children easier, better, smoother, more productive?
- We have come to the end of the questions. Is there anything else you would like to add?
- We are planning to develop a multimedia communication tool for this group of children. Would you like to provide feedback on it once it has been developed?

6. Thank you for your time

These interviews will help to shape an online survey. If you have the time, it would be helpful if you would fill it in. Thank you so much for your time.

Appendix 10. E-flier invitation sent to potential participants (Chapter Three)

- ☑ Are you a Dietitian or Dietetic Assistant?
- ☑ Do you work with overweight or obese 7 to 11 year old children?
- ☑ Do you treat some of these children (and their families) in one-to-one appointments?

We want to hear from you !

We are researching how Dietetic health professionals communicate directly with primary school-aged children and their families. **Would you consider taking part in a telephone interview with a Paediatric Dietitian Researcher?**

If you answered YES to these questions, please:

- Read the *Information Sheet* emailed with this flyer
- Click on http://www.surveymonkey.com/s/DietTalk for the *Consent Form*

Please contact Carol on 07758 3817069 or mcxcar@nottingham.ac.uk if you have questions or technical difficulties

Thank you

Appendix 11. Dietitian participant information sheet (Chapter Three)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Talking with key stage 2 (7 to 11 year old) overweight or obese children about diet: the views of dietitians and dietetic assistants

Investigators:
Mrs Carol Raaff, paediatric dietitian and researcher
Prof Cris Glazebrook, Professor of health psychology
Prof Heather Wharrad, Professor of e-learning and health informatics

Healthy Volunteer's Information Sheet

You are being invited to participate in a research study. When considering whether or not to participate in this study, it is important that you understand why this research is being done and what it will involve. Please ask the investigator, Carol Raaff, any questions or queries you might have. Thank you for your interest in this study.

Background

Part of the dietetic role in child weight management involves promoting and supporting dietary behaviour change. Communication skills are at the heart of facilitating this change. However consultations with children can be particularly tricky. This research seeks to explore the range of professional approaches and views concerning how to engage primary school-aged children about diet. It will also explore the resources that dietitians and dietetic assistants have to support this communication and their ideas for improvement. The findings will contribute to the design and development of a *universally available,* innovative interactive resource designed for child weight management consultations and suited to a variety of dietitian/dietetic assistant communication styles and approaches.

What does the study involve?

This research consists of two phases; telephone interviews followed by an e-survey. Eligible dietitians and dietetic assistants are invited to take part in either a telephone interview, or the online survey, or both. The content of this information sheet relates to the first phase of the study – telephone interviews.

Eligible dietitians and dietetic assistants are invited to take part in an individual telephone interview with the researcher at a mutually convenient time. Each interview will last approximately 30 minutes. The conversation will be recorded and transcribed. All identifiable data will be removed from the transcript. Data from these interviews will inform the questions in an online survey to be advertised within the next couple of months.

We are very grateful for your interest and we would value your views.

Why have you been chosen to take part?

BDA Paediatric Group and DOM UK members are being contacted because we would like to find dietetic health professionals involved in child weight management. Any of your colleagues (whether they are specialist interest group members or not) who meet the inclusion criteria are also invited to take part in this study.
Inclusion criteria:

- *Dietitians* or *dietetic assistants* who *talk* with *overweight or obese 7 to 11 year old children* about dietary behaviour change. This may form a minor or major part of the role.

- At least some child weight management consultations take place within the context of an *individual* or *one-to-one appointment* (with or without parents/carers).

Do you have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part:

1. Please keep this *Information Sheet* (save it electronically or print a hardcopy)

2. Complete the *Consent Form* by clicking on http://www.surveymonkey.com/s/DietTalk (this link will redirect you to SurveyMonkey®).

3. If you would prefer a hardcopy of the consent form, or you would like further information, please email Carol Raaff on mcxcar@nottingham.ac.uk or 07758 3817069.

You are free to withdraw at any time without giving a reason.

What is something goes wrong?

If you have reason to complain about this study, complaints should be addressed in the first instance to Prof Cris Glazebrook (Professor of Health Psychology, Institute of Mental Health, Jubilee Campus, Triumph Road, Nottingham NG8 1BB). If the matter remains unresolved, you may also contact the University of Nottingham Medical School Ethics Committee Secretary: Louise Sabir, Division of Therapeutics and Molecular Medicine, D Floor, South Block, Queen's Medical Centre Campus, Nottingham University Hospitals, Queen's Medical Centre, Nottingham NG7 2UH.

Will my taking part in this study be kept confidential?

In accordance with the Data Protection Act (2000), all personal and identifiable information that is collected about you during the course of this research will be stored in a database that is password protected and strictly confidential.

It should be noted that personal details are being collected via an online form and, while SurveyMonkey® offers data security, there is always the risk of intrusion by outside agents, i.e. hackers, and therefore the

possibility of your details being viewed by others. You may prefer to contact the researcher (contact details below) to arrange for the Consent Form to be posted or emailed to you, and to provide your personal details by telephone or other means.

What will happen to the results of this study?

Data from the telephone interviews will be used to finalise the questions of the second phase of this research (the e-survey), and to design and develop an interactive resource that will be shared with the Paediatric Group and DOM UK members in 2013. Data will also be written up and submitted to a peer review journal and presented as part of a PhD thesis.

Who has reviewed the study?

This study has been reviewed and approved by The University of Nottingham Medical School Ethics Committee.

Further Information:

If you would like to find out more about the study, please contact:

Carol Raaff
Paediatric dietitian and researcher
mcxcar@nottingham.ac.uk
07758 3817069

Thank you for your time.

Appendix 12. Codebook for scoring interviews with paediatric dietitians on their views about talking to overweight 7 to 11 year old children (Chapter Three)

Background

This codebook has been developed following the qualitative analysis of data from semi-structured telephone interviews with paediatric dietitians who offer advice within the context of individual appointments to overweight and obese preadolescent children and families.

The interviews aimed firstly to understand dietitians' experiences and opinions on talking to 7 to 11 year old children, and the degree to which these clinicians tend to involve children in child weight management appointments. Secondly, the interviews intended to explore the educational resources these health professionals use within consultations to support diet-related behaviour change, whether these resources are targeted at the child or the parent(s) and the clinician's views on the suitability of these resources to support communication.

Each of the 18 interviews lasted between 17 and 45 minutes (mean=31.24±7.51). Verbal data were recorded and then transcribed verbatim. The recording equipment failed during one interview, resulting in an inaudible data file. Data from this interview was excluded from the analysis. On all of the remaining transcripts, the interviewer's interjections were captured in square brackets in regular font []. Additional text has been added to some extracts to provide context or clarity, all of which were based on previous data within the interview, such as questions or previous statements. These additions appear in italics within square brackets *[]*. For example:

> "I would like to *[use food models]*, but I don't…"

Sections of some extracts have been removed, as they detract from the essence of the excerpt, or they evidence a separate theme. In both cases, this is indicated by the phrase in italics: *[deleted section]*.

Half (n=8) of the 17 dietitians, included in the analysis, had qualified in the past five years. Four study dietitians had been qualified for between 27 and 30 years. These dietitians had generally started to work with overweight children and their families when they had started to specialise in paediatrics. Most (n=11) had begun practising in child weight management within the past five-years; of these, one dietitian was newly qualified and four had less than two-years of experience in this speciality. Four of the participants had worked with overweight children and families for more than 10 years.

Six themes have emerged through inductive analysis of the data. A brief overview of each theme has been provided, followed by more detailed descriptions and examples of their related subthemes.

Theme 1 - Childhood obesity is a complex condition to treat

Childhood obesity i

s complex for dietitians to treat because of its sensitive nature. Children may feel awkward or embarrassed. Guilt, combined with a lack of the necessary parental skills and knowledge, often leaves parents unsure of how to manage the reality of the situation at home. Dietitians are presented with, and expected to deal with, these complex issues within the time-constraints of an appointment.

Subtheme 1a: Subject matter and situation are sensitive

Description – Childhood overweight and obesity is a sensitive subject for the child, the parent, and/or the dietitian. By extension an appointment, in which child weight management is discussed, can be awkward.

Look for – References to the child, parent or dietitian feeling awkward or embarrassed within the appointment. Simply attending the appointment may be difficult, or the discussions themselves may be uncomfortable – for the dietitian to raise, the parent to hear, or the child to engage with. Sensitive issues such as weight-related bullying are raised, and attempts to 'avoid upsetting' or 'psychologically harming' the child, or not wanting the child to hear (or perhaps understand) aspects of the conversation between the dietitian and parent are also described. Some dietitians describe the situation within such an appointment as 'difficult', implying a lack of confidence, or suggestions that they would appreciate further training in how to manage these appointments. Dietitians attempt to refer to childhood obesity sensitively, choosing to use more culturally acceptable words to describe overweight or obesity. Some dietitians sidestep the issue by talking about the child being ' above a healthy weight', or how tall the child is. It includes phrasing information in a 'positive' way, as an acknowledgement that weight management can be difficult for the child.

Example – "…like if they *[children]* are…whether they are more, um, embarrassed about their weight [yes]. For those older ones, near age 11, and they really don't want to talk about it."

Exclusions – Extracts relating to a general lack of child willingness to communicate, or take part, in the conversation, without mentioning feelings of awkwardness or embarrassment.

Example – "And then, like, you get other children, and you just…there is nothing…and you will challenge and motivate the change and they put up quite a few barriers to parents when they make the changes."

Subtheme 1b: Parental skills affect treatment

Description – Parental skills, such as parenting, education and general life skills, are an important consideration when treating children who are overweight, affecting the information given and the approach used within a child weight management consultation.

Look for – Extracts describing discussions relating to parenting: parenting issues, positive parenting, or a lack of parenting skills. Parenting need not be mentioned, but there may be references to the need to deal with boundary-setting or parental disciplining of children. Parental knowledge and understanding of the situation; the dietitian describing a lack of parental awareness of the part they have played in their child becoming overweight and therefore their role in managing their child's weight. Also

included are allowances the dietitian needs to make when providing information to parents; taking into account varying levels of parental education, parental literacy levels, English-language skills, parental learning difficulties, and cooking skills. All of these determine not only the information that is provided to parents, but also the way in which it is communicated to them.

Example – "…a lot of the stuff that we talk about with the parents is about parenting styles [yes] and setting boundaries…"

Exclusions – References to parental support (or lack there of) for the child's involvement in the conversation, or the level of parental participation in the conversation.

Example – "…I would say that if parents, um, were quite dominating… *[deleted section]* …some parents are laid back and they want the child to take the onus on them…"

Subtheme 1c: More satisfactory dietetic treatment requires more time

Description – Additional appointment time, either longer appointments or extra appointments, would benefit dietetic management of childhood obesity.

Look for – The dietitian having changed treatment practice due to time pressures, or wishing to change their practice to be more effective but restrictions on time preventing them from doing so. Indications that involving the child more in the consultation takes more time, and mentions of wanting to use different resources or to 'do more' but time being the prohibitive factor. Dietitians also tend to feel that there is a lack of time within the typical consultation and more could be done to help children and families if more appointment time was available.

Example – "…it's frustrating having only half-an-hour [mmm]. I…I think an hour would be much more realistic [mmm] to be able to do a full assessment [yes] and really get more out of that appointment really, and also I would prefer to have half-an-hour for a follow-up to be honest."

Exclusions – Extracts that have no reference to time, or lack of time within the appointment, even if they refer to the complexity of the situation.

Example – "…'cos I find it quite an involved process… *[deleted section]* …because a lot of the issues that underlie the obesity are quite complex and need quite a lot of unpicking."

Theme 2 - Variability of dietetic communication approaches to the child weight management consultation

Dietitians tend to either try to communicate directly with the child, mainly with the parent, or with both the child and their parent in a form of partnership.

Subtheme 2a: Dietitian aims to communicate with the child directly

Description – The dietitian aims to focus on the child, during the appointment, and involve the child in the conversation as much as possible.

Look for – References to focussing on the child, aiming to engage the child, directing the conversation to the child, and having child-led appointments or conversations. Since these are exchanges between a dietitian and a child aged between 7 and 11 years, despite the emphasis being placed on child involvement, certain details discussed with the child may need to be checked with the parent, such as agreed goals or actions. Checking, and ensuring, that the child understands the purpose of the appointment, and the content of the conversation, is also important.

Example – "…I think it's important that the child is sort of focussed on the consultation, really."

Exclusions – Examples of *how* the child is involved in the conversation, such as building rapport, including the child in the conversation from the outset (or references to beginning the appointment by talking to the child), and utilising resources as the basis for the conversation, are not included in this subtheme.

Example – "Um, at the start…initially…asking them *[the child]*, um how they feel about either being there, are they aware of why they've been referred [mmm] and what their feelings are really, about their…their weight before – cough…sorry – before we even ask the parent, um, why they are there."

Subtheme 2b: Dietitian communicates with the parent and child in partnership

Description – The dietitian tries to engage with the parent and the child 'equally', acknowledging the need for the child and parent to work in partnership in order to achieve a change in the family's behaviour patterns.

Look for – Coded when the dietitian places equal importance on involving the parents and the child (phrases such as 'working together', or talking about a 'real mixture'), and includes references to enabling the child and parent to find a solution together, as well as communicating with the child to help parents manage the situation better at home. Partnership working is evident when the dietitian talks about involving parent and child at appropriate junctures of the conversation, and mention of certain pieces of information coming from the child and others from the parent.

Example – "And particularly if they are *[the child is]* 11, and at secondary school [yes]. Because often, I don't think the parent often does actually really know they have done at lunchtime. [laugh] So I think you start to get quite more 50:50 then, perhaps. Definitely 70:30…with still quite a lot from the parents."

Exclusions – References to the degree to while the child is involved based on age, ability or maturity *alone* are excluded from this subtheme. Using the 'partnership' approach by default, i.e. involving the parent more because of the child's unwillingness to engage in the conversation, is also disregarded.

Example – "I would think with a seven year oldy, it would probably be more from the parent [yes]. I tend to, and as the child is getting older, nearer 11, you can get, I think, quite a bit of information from the child."

Subtheme 2c: Dietitian communicates with the parent to support the child

Description – There is an emphasis on parental involvement – supporting the parent to make the necessary changes that in turn will help the child achieve a healthier weight.

Look for – Extracts in which the dietitian emphasises parental involvement, with a view to equipping or empowering parents in some way. Underlying this perspective is the understanding that parents of preadolescent children are crucial to bringing about lifestyle change within the family home and therefore ideally positioned to help children of this age to change health behaviours. These include references to parent-only consultations, in which children are not invited to, or asked to leave appointments.

Example – "…I would probably spend the majority of the conversation, in this age group, um, understanding the issues with the parent [yes] but including the child in that conversation where it was relevant [OK]. But I really feel, in this age group, that um very often it's the parent that needs to be supported to help the child to make changes [yes]. They haven't really reached the age, you know, a child doesn't want to do it…etcetera, etcetera… It's more about engaging the parents in change and them supporting the child to change."

Exclusions – References to a lack of parental involvement, or over involvement of parents, as barriers to treatment, this subtheme is also not about the *how* and *why* parents are involved, e.g. to address parenting.

Example – "…you know, for people who are a bit…you know, who are being forced to come by the…by the consultant [mmm], some…some parents really don't…they, you know, if the child's a bit overweight [mmm], they just think it's puppy-fat, don't they, and they'll grow out of it…"

Example – "…understanding what's underlying the obesity, then I would probably focus more on the parent [yeah]. So, what's going on at home, how they feel about boundary-setting, saying 'no' [yeah], um, that side of things…sort of parenting issues [yes]…"

Theme 3 – Capacity to communicate affects the child's contribution in the dietetic consultation

A number of factors affect how the dietitian talks to the child within an appointment. These include the ability of the child, which is in turn determined by factors such as their developmental age and maturity, their interest in the conversation, and the degree to which the parent encourages or hampers the child's communication.

Subtheme 3a: Developmental stage of the child determines their

ability to contribute

Description – Cognitive development and ability, as well as maturity affects the preadolescent child's ability to communicate with the dietitian within an appointment setting. Younger children tend to need more help from their parents, purely because of their developmental ability.

Look for – Extracts citing age-related factors as limiting or enabling factors for a child's involvement in the conversation. Specifically, reference made to the child's ability, or maturity to enter into the discussion, and the relative responsibility they may already have over certain food choices. By extension, this incorporates limitations on the accuracy and extent of information that is available from the child, the attention span of 7 to 11 year olds, and the range of communication abilities within this age group.

Example – "Usually it's more parent input if they *[children]* are younger."

Exclusion – The child's level of Interest or willingness to engage in the conversation are not coded for in this subtheme. References to partnership-working with the parent (see subtheme 2b) are also excluded.

Example – "It depends on how much the child wants to talk."

Subtheme 3b: Child willingness to be involved affects communication

Description – The extent to which a child wants to engage in the conversation largely determines their involvement in the conversation.

Look for – Indicators include references to the child's level of interest as either an enabler to communication, or as a barrier. Words such as 'willingness', 'interactive', and 'engagement' are used to describe the dietitian's perception of child when they try to talk to them during the appointment. The child's readiness to address their weight is another important factor, which has a bearing on whether they want to talk to the dietitian about their weight, or not.

Example – "I suppose it depends on the engagement of the child [mmm], if that makes sense. So if there is a child that has been dragged along [mmm] [laugh], who doesn't really want to be there [it'll be all the parent…laugh], it might be largely aimed at the parent [yeah]. But if it's a child whose come there…um, I had one yesterday for example who…a little girl…who was fully engaged and was really open [mmm], telling us why she was keen to change her weight and her lifestyle."

Exclusion – This subtheme does not deal with the capacity (or developmental ability of the child) to engage. Neither does it include willingness to engage based on the sensitivity of the situation or the subject matter, e.g. if the child did not want to talk because they were embarrassed, or nervous.

Example – "Sometimes when they *[children]* come in to clinic and, um, don't particularly want to speak to you [mmm] or they are very, um, very reserved about what they want to say or possibly embarrassed or scared [laugh] sometimes of coming in [yes]. 'Cos most parents tend to say, 'We've spoken about

this before we came into clinic.' [mmm] But quite often, the child won't necessarily open up."

Subtheme 3c: Parental support influences child participation

Description – Parents can affect the degree to which a child takes part in the conversation.

Look for – Extracts that mention parental impact on the conversation – parental encouragement or support, parents that contradict the child's response or version of events, or parents who interrupt or who are dominant in the conversation. Other indicators of parental support, or lack thereof, are parents being unwilling to attend the appointment in the first instance.

Example – "…and quite often the…the…the mother or parent or other carer is…is answering questions [yeah] for them."

Exclusion – References to other parent-related barriers to the consultation, such as a lack of parental skills or ability to support the child.

Example – "…something that is a real barrier is um which we talk about, both on a one-to-one and in the group sessions, is, um, parents who, um, are quite happy to let their children just have…you know they don't set boundaries [yes]…and that can happen…you know, I think the clinic situation reflects what's going on at home [yes]. So, sometimes children who come start to run riot, either in the clinic setting or in the group setting [yeah]. And that is something that I have definitely learnt over time…is to bring that back to a constructive consultation…"

Theme 4 - Dietetic strategies for verbal communication with the child

Two of the main *verbal* strategies used by dietitians to include a young child into the conversation about their diet and physical activity levels, are firstly to interest them in what is being discussed, and then to go on to allow them to grasp the essence of what is being discussed by making the content of the conversation relevant and age-appropriate.

Subtheme 4a: Dietitian verbally engages the child in the conversation

Description – The dietitian talks to a child in a way that invites them into the conversation, and holds their interest. This tends to be woven into the conversation at a later stage, or used to encourage them to identify specific goals.

Look for – References to the initial greetings and introductions the dietitian uses, as well as making a point of trying to talk to the child from the outset, e.g. from when they walk in the room, or using the first appointment to get to know the child. Another significant aspect of engaging the child is rapport building, in which the dietitian aims to put the child at ease, whilst building an affinity with them, e.g. using small talk. There also tends to be an attempt to understand the child's perspective on the their health, what they understand the appointment to be about, their

overall goals, and what motivates and interests them. Evidence of physically engaging the child, such as by shaking their hands, is a further indicator.

Example – "…'How was Christmas?' 'What have you been doing?' 'How is school?' [Yeah.] 'What was your holiday like?' I usually put little things of my cards to say…if they've said, ah, they're going on holiday or they're going away for the weekend or something, I'll always make a note of that…because, you know, at the minute, 'Oh, what did you get for Christmas?'"

Exclusion – Attracting or maintaining the attention of the child with the help of resources, games or other visual aids. It also excludes general statements about trying to engage the child (in conversation), or focussing the conversation on the child. An exception would be if the extract emphasises the importance of trying to engage, or include, the child in conversation from the outset, or during the first session.

Example – "We would try to keep them engage, if that is the way they *[the child is]*...feeling, but if they are not as engaged, then I would still continue with, um, talking to the parent as well [yeah] while still trying to capture their attention if possible."

Subtheme 4b: Dietitian makes the conversation verbally accessible to the child

Description – The dietitian uses verbal communication strategies to make the conversation more accessible and appropriate or relevant to the child.

Look for – The various techniques used by the dietitian include use of language; using the child's language (sometimes called reflecting or mirroring), or adopting simpler phraseology, ensuring that wording of concepts and information is age-appropriate and ability-appropriate. It is also important that the child can access the content of conversation, through language that is meaningful and relevant to them. Dietitians sometimes use familiar analogies to convey concepts, and they tend to address topics that are within the child's control. Dietitians try to be specific in their questions and information giving, providing brief key messages that are 'simple' or 'basic'.

Example – "…you need to be quite focused about that bit of the conversation, so you need to sort of capture them *[the child]* and it may only be for a few minutes [mmm], just to sort of clarify the goals that we've agreed…"

Exclusions – References to language or words used to describe overweight or obesity, distraction techniques, and barriers to the child accessing the conversation.

Example – "…taking the focus off, you know, why they *[the children]* are there and feel so nervous…"

Theme 5 - Features of resources that can support child communication

Dietitians identify three characteristics of resources useful in supporting child-dietitian communication. The first is that resources need to appeal to

the child by being attractive or interesting in some way. Secondly, they should be age-appropriate so that they are accessible or useful for communication. Finally, useful resources serve as scaffolding for the verbal exchange between the child, parent and dietitian, forming the concrete basis for the conversation.

Subtheme 5a: Resources that appeal to the child can aid communication

Description – Resources that support child communication tend to appeal to children. These visual aids attract a child's attention and are intended to maintain a level of interest.

Look for – Dietitians identify a number of resource design features that they think appeal to children and encourage children to use them. These include some level of interactivity (drawing, writing, touching three-dimensional models, activity-based games, and electronic resources), visual attractiveness (bright, colourful, pictorial, and cartoon-like images), and the resource being inherently fun, such as a game. Another important factor identified is that resources should preferably be picture-based rather than text-based, with age-appropriate pictures and containing minimal text, and text should also generally be larger and easy to read.

Example – "Also, they *[the resources]* are really bright and colourful, which I think is really attractive to children as well, rather than giving them a black and white photocopy [yes]. So, yeah, I think the presentation is quite important…and they are child-friendly as well, with nice pictures and nice visual content in them."

Exclusions – Characteristics of resources that make communication more accessible to children, i.e. the information conveyed through the resource, such as references to the age-appropriateness of the resource, either the text or content.

Example – "Um, so something that is more specific to the child…that they can pick up and read and sort of follow…"

Subtheme 5b: Useful resources help to make information more accessible to the child

Description – Useful resources are accessible to the child. This subtheme describes the content of the resource and how information can be made useful to a preadolescent child.

Look for – Extracts referring to the age or ability-appropriateness of the information contained in the resource or the concepts upon which they are designed. Other indicators are that information, messages, or content in general, needs to be simple, clear, and specific. It is helpful if these messages are already familiar to the child, as well as identifiable, memorable, and relevant or meaningful. Furthermore, messages should be age-appropriate, including the language used within the text.

Example – "So, sometimes if it's an older child, I might use that sheet *[a previously mentioned number-based resource]…[deleted section]*...But with the younger children, I would usually,

um…like draw on a ladder on a Healthy Person Sheet or something…"

Exclusion – References to the resource being used as the basis for the conversation; or extracts describing how the resource is used as a reference point within the verbal conversation.

Example – "…and [hmmm] they *[the child]* can quite quickly look at that *[the resource]* and compare things…"

Subtheme 5c: Resources can serve as a visual reference for the child, parent and dietitian

Description – Describes the resource as forming the basis for the conversation, visually supporting verbal discourse.

Look for – References to the resource serving as visual reminder or point of reference for the child, in some way helping them in the communication process, e.g. acting as a prompt or as the basis for communication. Dietitians describe using information leaflets, or visual aids, to provide ideas from which parents and children can make specific choices when deciding on changes to their lunchboxes or main meal ideas. This subtheme also incorporates evidence of the dietitian drawing pictures and using diagrams to illustrate a message they are verbally trying to communicate, or information they are trying to clarify. Using the resource as a visual reference of the conversation, beyond the appointment – specifically child ownership of the resource.

Example – "…sometimes I do sketches on my notepad [mmm], when we're *[dietitian and child are]* talking about portion sizes [mmm] and you know, I'll refer to the palm of my hand or the palm of their hand [yes], when we're talking about slices…pieces of ham. 'How much meat do you have?' [sure] and fruit and veg…"

Exclusion – Extracts relating to the usefulness of pictorial or visual elements alone, or a description of the resource, without explicitly linking these visual aspects with verbal conversation, communicating ideas, messages or concepts (including education). Also excluded are written goals or agreed action plans that are written during the appointment.

Example – "…resources *[deleted section]*…that were sort of, you know, almost…almost sort of like cartoony [mmm]. You know, 'this is hunger-monster' and 'how to deal with the hunger-monster [yeah] in your tummy' and what…'what does it feel like when you are hungry?'"

Theme 6 – Dietetic expectations for resources for the child weight management consultation

Resources need to be useful, not only to children and parents, but to dietitians as well. Many dietitians stated that the resources that they use need to in some way support individual approach to weight management consultations. Due to the diverse needs of children and families that they treat, dietitians prefer resources that can be adapted and tailored to individual circumstances to some extent. There is also a general

dissatisfaction with the quality of resources currently available for child weight management, particularly in this age group.

Subtheme 6a: Resources should support individual dietetic practice

Description – Dietitians prefer resources to reflect and support their approach to consultations.

Look for – Extracts relating to the dietitian's own practice, what they find useful within the consultation setting. Specific references to resources that 'go along' with their message, that 'complement' their philosophy or approach, or statements that resources have 'got to work' or they need to feel 'comfortable using' them.

Example – "I wouldn't use something *[a resource]* that wouldn't be appropriate in this setting [no, that's fair enough]. I just think it's got to be like simple [mmm], it's got to work."

Exclusions – Excerpts describing resources that either parents or children find beneficial.

Example – "…they have *[the resource has]* a traffic light for healthy eating plans. [Yes, I've heard of that one. Yeah.] It's actually, really a…I've been using it and finding it useful…people [parents] get it…"

Subtheme 6b: Useful resources are tailorable and adaptable to reinforce specific dietetic messages

Description – Dietitians value the ability to tailor a resource to the individual child (and their families), each with a unique set of circumstances, needing specific individualised advice.

Look for – Evidence of using different resources with different children and/or families. Dietitians make mention of 'tailorable', 'personalise messages', 'adapting', 'adjusting', 'individualising' information. These qualities can be mentioned in terms of individuality, such as differences in each child's dietary needs, body size, age, growth stage and physical activity levels. They value 'flexibility' within a resource, and require that information be given 'proportionate to change' (in other words; specific information to support those changes that have been agreed). Part of this subtheme is therefore the ability to create specific reminders of the discussion, e.g. written goals, tips and plans.

Example – "…I would definitely say 'not too prescriptive' is a really good idea [yeah], um, and certainly to have…to have, um, a range of resources all on the one, you know, all on the one programme [yeah], I suppose, would be really good because I suppose, as I was saying…we have loads of resources….and that was because we didn't want it so prescriptive [yes] because one…one doesn't fit all, you know, and then you're not able to tailor…so then, yeah, you're just not tailoring to that…that particular family…"

Exclusions – General references to goals, e.g. SMART goals, without explicit links to those goals being written down as a resource for parents and children.

Example – "Um, and we will go around to each family individually and make sure their targets are SMART. [Yes, make sure they are manageable.] Yes, not too weird and wonderful."

Subtheme 6c: Limitations of available dietetic resources

Description – Some dietitians express dissatisfaction with resources currently available.

Look for – Preferences for professionally produced resources. Also included are references to a general lack of suitable and/or appropriate resources for children of this age group. Drawbacks of dietitians producing their own resources are that they are time-consuming, not cost-effective, that the in-house produced resource is less desirable. It can also be challenging to keep information current and up-to-date.

Example – "…I feel that we lack in our resources [mmm]. I haven't really come across a resource that is amazing [yeah]. I…I feel that we're kind of making do with resources [have you got any…sorry]. Sorry…we use come of the Change4Life…well I try to use some Change4Life but even that…that from a child weight management point of view [mmm], is quite limited."

Exclusion – References relating to the characteristics of resources that support child communication, i.e. subthemes 5a, 5b and 5c are excluded from this subtheme, as are references to desirable features for dietetic practice, such as the resource being tailorable and adaptable.

Example – "*[Better resources would be]*…having very neutral resources that don't really say much [mmm]…that you could tailor to the child [yeah] and you could write your own sort of front page to."

Appendix 13. University of Nottingham ethics approval letter (Chapter Three)

Direct line/e-mail
+44 (0) 115 8231063
Louise.Sabir@nottingham.ac.uk

Faculty of Medicine and Health Sciences

Medical School Research Ethics Committee
Division of Therapeutics & Molecular Medicine
D Floor, South Block
Queen's Medical Centre
Nottingham
NG7 2UH

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Fax: +44 (0) 115 8231059

10th December 2012

Mrs Carol Raaff
PhD Student & Paediatric Dietitian
School of Community Health Sciences
QMC Campus
Nottingham University Hospitals
Nottingham
NG7 2UH

Dear Mrs Raaff

Ethics Reference No: G15112012 CHS Diet
Study Title: Talking with key stage 2 (7 to 11 year old) overweight or obese children about diet: The views of dietitians and dietetic assistants.
Lead Investigator: Mrs Carol Raaff, PhD Student and Paediatric Dietitian, School of Community Health Sciences.
Chief Investigators/Supervisors: Professor Cris Glazebrook, Professor of Health Psychology, Head of Division of Psychiatry, Professor Heather Wharrad, Professor of e-Learning and Health Informatics, School of Nursing Midwifery and Physiotherapy.
Duration of Study: 1/1/13-1/5/13 4mths **No of Subjects:** 260

Thank you for your letter dated 3rd December 2012 responding to the advice given by the committee and enclosing the following revised documents:

- Recruitment Advert 03.12.12
- Healthy Volunteer's Information Sheet Final version 1.0:03.12.2012
- Healthy Volunteer's Consent form final Version 1.0:03.12.2012 (including link to online version)
- Telephone interview Schedule – final version 1.0: 03.12.2012

These have been reviewed and are satisfactory and the study is approved.

The following documents were previously reviewed and approved:

- Application form dated 11/1/2012
- Application – short project proposal – draft 3 31.10.12
- Healthy Volunteer's Information Sheet for interview version 4 30.10.12
- Healthy Volunteer's Information Sheet for online Questionnaire version 4 30.10.12.
- Recruitment poster for Interview dated 30.10.12
- Recruitment poster for Online Questionnaire
- Instructions and questions for online survey – draft7 31.10.12
- Interview schedule –draft4 31.10.12

- These have been reviewed and are satisfactory and the study is approved.

Approval is given on the understanding that the Conditions of Approval set out below are followed.

Conditions of Approval

You must follow the protocol agreed and any changes to the protocol will require prior Ethics' Committee approval.

This study is approved for the period of active recruitment requested. The Committee also provides a further 5 year approval for any necessary work to be performed on the study which may arise in the process of publication and peer review.

You promptly inform the Chairman of the Research Ethics Committee of

(i) Deviations from or changes to the protocol which are made to eliminate immediate hazards to the research subjects.

(ii) Any changes that increase the risk to subjects and/or affect significantly the conduct of the research.

(iii) All adverse drug reactions that are both serious and unexpected.

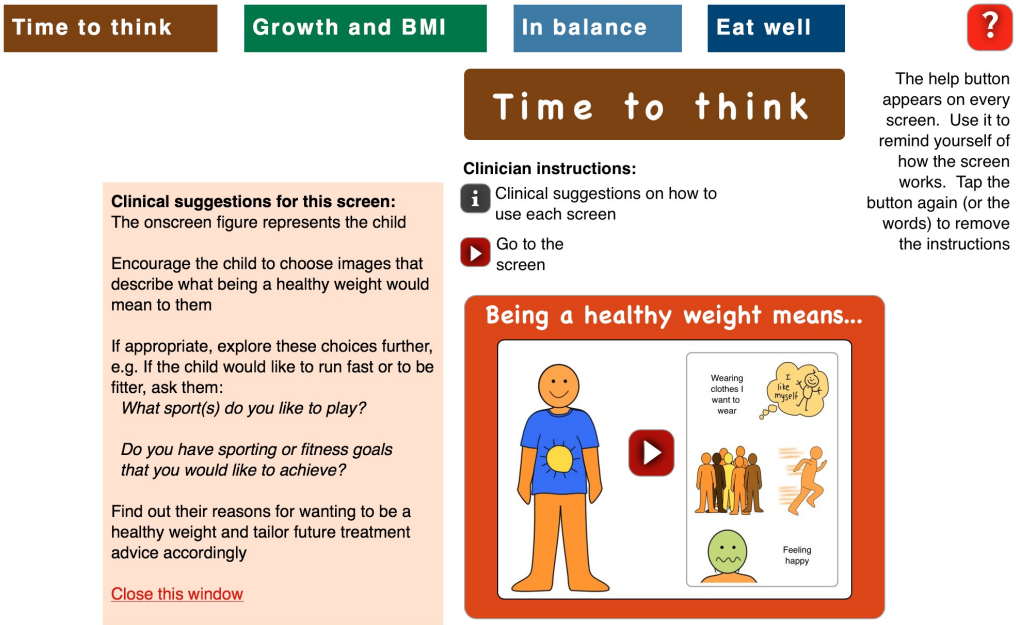
(iv) New information that may affect adversely the safety of the subjects or the conduct of the study.

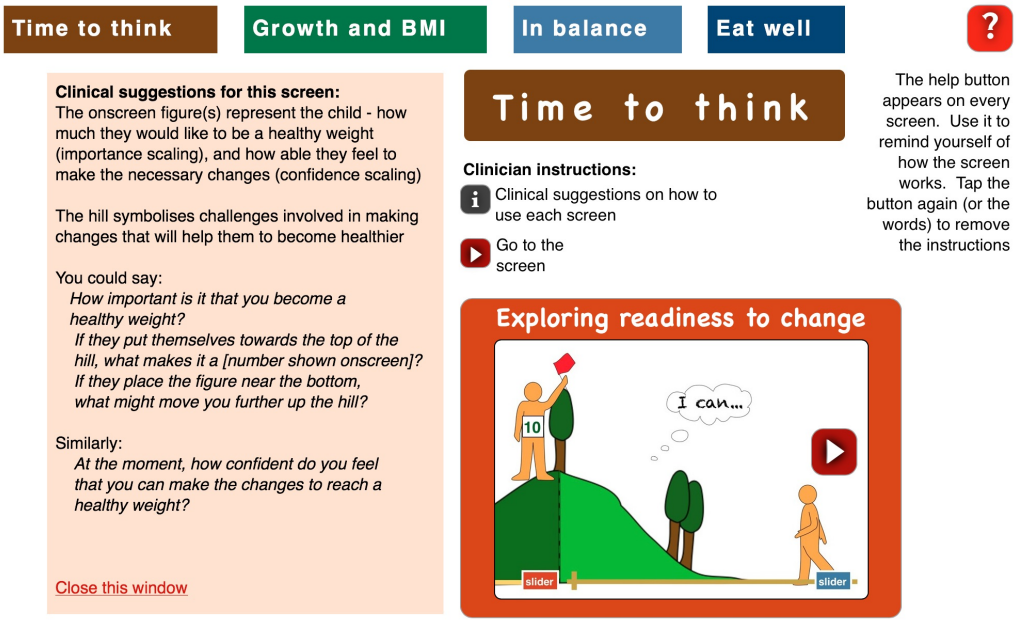
(v) The attached End of Project Progress Report is completed and returned when the study has finished.

Yours sincerely

Dr Clodagh Dugdale
Chair, Nottingham University Medical School Research Ethics Committee

Appendix 14. Clinical suggestions for the *Feed-back* e-resource (Chapter Four)





Time to think | Growth and BMI | In balance | Eat well

Clinical suggestions for this screen:
This is a side-view of the 'Exploring readiness to change' screen. The path represents the journey the child would need to take to get to the top of the hill (i.e. make healthy changes)

There may be obstacles to changing lifestyle habits. Explore these difficulties with the child. You could say:
Are there things that could get in the way of making healthy changes?

Or ask more specific questions:
How do you feel about eating fruit and vegetables?
Could choosing to eat more fruit or vegetables more often help you to reach a healthy weight?
Can you see yourself doing more exercise?

Once a solution has been found, ask the child to 'remove' them onscreen (and no longer block the path)

Close this window

Time to think

Clinician instructions:
Clinical suggestions on how to use each screen
Go to the screen

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Time to think | Growth and BMI | In balance | Eat well

Growth and BMI

Clinician instructions:
Clinical suggestions on how to use each screen
Go to the screen

Clinical suggestions for this screen:
This screen shows the child, and parent, what may happen if they do not work together to make healthy lifestyle changes

You could say:
If we don't help you to make healthy changes, you may keep getting heavier, and your BMI will go up (or increase)

What will happen to your body shape if your BMI goes up?

Close this window

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Time to think | Growth and BMI | In balance | Eat well

Growth and BMI

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinician instructions:

Clinical suggestions on how to use each screen

Go to the screen

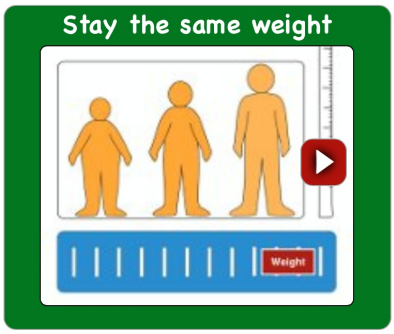
Clinical suggestions for this screen:
This screen shows the child and parent what could happen if healthy lifestyle changes were made

You could say:
Keeping your weight the same, while you are still growing, will start to change your BMI and your body shape over the next few months

What will happen to your BMI?

What will happen to your body shape?

Close this window



Time to think | Growth and BMI | In balance | Eat well

Eat well

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinician instructions:

Clinical suggestions on how to use each screen

Go to the screen

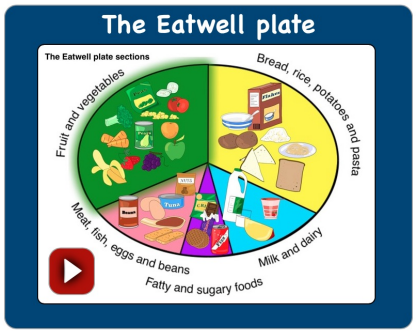
Clinical suggestions for this screen:
This section can be used in different ways:
- To start talking about food, e.g. food preferences
- To gauge knowledge about a balanced diet and healthy eating
- As a teaching tool

You could:
Talk about the size of each section
e.g. What do you think this means?

How big is the 'fatty and sugary' foods section (compared to the others)?
How many portions do you think that is?

Do you eat fruit?
If so, which? How many?
Which do you like/have you tried?

Close this window



Time to think | Growth and BMI | In balance | Eat well

Eat well

Clinician instructions:

Clinical suggestions on how to use each screen

Go to the screen

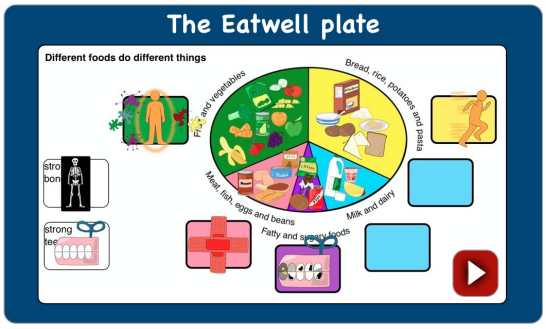
The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinical suggestions for this screen:
Talk about the uses of the four main food groups

You could ask:
What use does the 'fatty and sugary' food group have?

If appropriate, link to the 'Caloriser' ('In balance' section)

Close this window



Time to think | Growth and BMI | In balance | Eat well

Eat well

Clinician instructions:

Clinical suggestions on how to use each screen

Go to the screen

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinical suggestions for this screen:
Complete a paper-based 'typical day' scenario or a 24-hour recall.
Look through it together. Help the child to analyse their diet in terms of food group portions

Looking at the numbers of portions of each food group, you could ask:
How does what you eat (and drink) each day compare with the recommended shape of the Eatwell Plate?

What do you think you should change to make what you eat healthier?

Link to the 'My plate swaps' screen to talk about specific changes/swaps

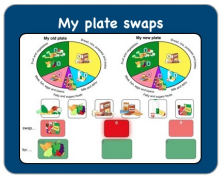
Close this window

Clinical suggestions cont:
Use 'My plate swaps' to agree specific dietary changes (in terms of food groups)

Where possible, encourage the child to identify his/her own swaps. This may require prompts, e.g. *What do you think about your breakfast, or your snack(s)?*

Once swaps have been made, a 'new plate' tracks overall changes to the child's diet

Close this window



Time to think | Growth and BMI | In balance | Eat well

In balance

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinical suggestions for this screen:
You could say:
Food gives the brain and body energy - to learn and think clearly, and to be active and have fun. We need to balance the energy from food, and the energy we use when we are active

How many meals, snacks, etc. do you have each day?
How active should you be to get energy balance?

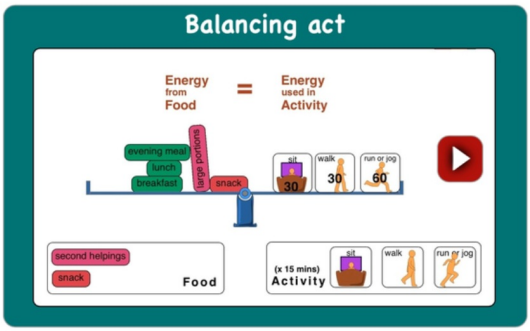
Talk about the appropriate changes to the child's current energy intake and output, e.g.
3 meals
'2 snax max'
at least 1 hour moderate intensity activity wach day
(**Note**: In this tool, running or jogging is classed as 'moderate intensity', walking is 'low intensity', i.e. half the energy output, and sitting is 'non-active, i.e. no energy output)

We all need to decide how to spend our time, e.g. 2 hours of leisure time represented in the Activity Tracker - *allow enough time for the activity that your body needs*

Close this window

Clinician instructions:
Clinical suggestions on how to use each screen

Go to the screen



Time to think | Growth and BMI | In balance | Eat well

In balance

The help button appears on every screen. Use it to remind yourself of how the screen works. Tap the button again (or the words) to remove the instructions

Clinical suggestions for this screen:
This section is intended for children who:
- Want to know more about calories
- Enjoy high calorie snack or drinks, and who struggle to understand the benefit of a healthier/lower calorie choice

You could say:
Choose a food/drink to feed into the Caloriser

Energy stored in food is called calories
Most sugary and fatty foods are high in calories

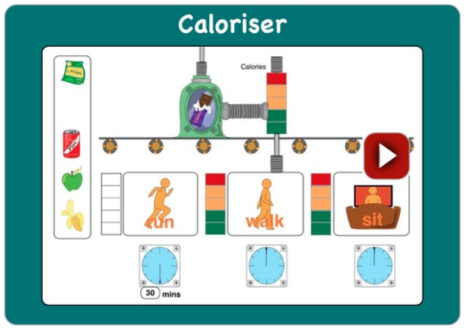
The fuel cell shows how many calories (or energy) is in each food

This section could become a guessing game, e.g. *which food/drink is the healthier choice?*

Close this window

Clinician instructions:
Clinical suggestions on how to use each screen

Go to the screen



Feed-back: An e-resource for child weight management

Thank you for your time

Feed-back is intended for:

- Overweight 7 to 11-year-olds
- Dietitians (potentially other relevant health professionals)
- One-to-one appointments
- Tablet device (preferable), PC or laptop

Please have a look at the e-resource, either at the stand today or via the blog:

http://dietitian-feed-back.weebly.com

What is your feedback?

1. Please complete this questionnaire
2. Feel free to annotate the images with comments and/or suggestions
3. Return it to the stand or post it in the self-addressed envelope provided

Carol Raaff – mcxcar@nottingham.ac.uk
Paediatric Dietitian – Child weight management
Staffordshire and Stoke on Trent Partnership NHS Trust
PhD Researcher – Division of Applied Psychiatry and Psychology
University of Nottingham

Please answer the following questions:

Overall, I would be comfortable using this resource with children:

Yes No

I would rate this e-resource as:

Poor — *Very good*

1 2 3 4 5

Have you noticed any difficulties or would you like to make any comments?

_____

_____

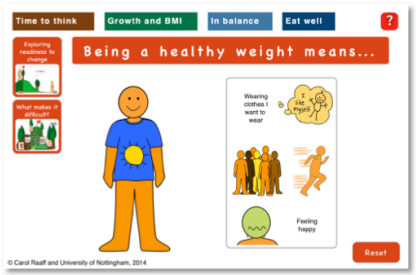
_____

_____

_____

Time to Think (part 1 of 2)

Help instructions: Tap as many images as apply (the child may think of other images that are not represented here)



Help instructions: Drag each of the two sliders to help the child to think about how much they would like to make healthy changes, and to what extent they feel they can make those changes

Comments	*Being a healthy weight means…*				*Exploring readiness…*			*Comments*
		Yes	No	I **tried using** this screen:	Yes	No		
		Yes	No	This is/would be **simple** to use:	Yes	No		
		Yes	No	This would be **useful** for clinical practice:	Yes	No		
	Good	OK	Poor	The **on-screen interactions/ animations** are:	Good	OK	Poor	
	Good	OK	Poor	The **images** are: (e.g. clear, engaging, appropriate)	Good	OK	Poor	

Time to Think (part 2 of 2)

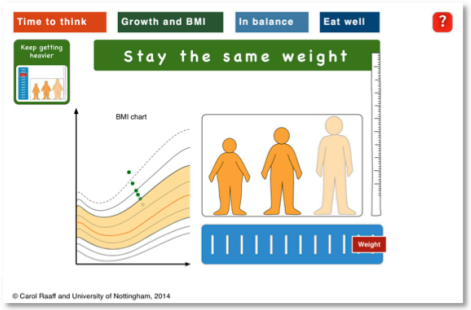
Help instructions: Help the child to identify and talk through their obstacles to making healthy changes Click on a difficulty to show how it can block the 'path' to becoming healthier When a solution has been found, click on the obstacle again to remove it from 'the path'

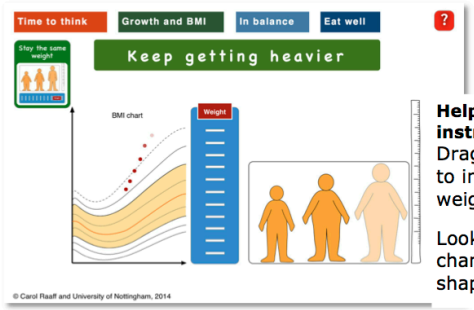
What makes it difficult?				*Comments*:
I **tried using** this screen:	Yes	No		
This is/would be **simple** to use:	Yes	No		
This would be **useful** for clinical practice:	Yes	No		
The **on-screen interactions/ animations** are:	Good	OK	Poor	
The **images** are: (e.g. clear, engaging, appropriate)	Good	OK	Poor	

Growth and BMI

Help instructions: Drag the slider to keep body weight static over time

Look for corresponding changes in BMI and body shape



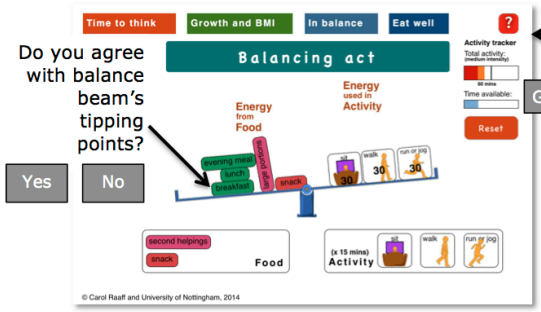


Help instructions: Drag the slider to increase body weight

Look for changes to body shape over time

Comments:	*Stay the same weight*				*Keep getting heavier*			*Comments*:
	Yes	No		I **tried using** this screen:	Yes	No		
	Yes	No		This is/would be **simple** to use:	Yes	No		
	Yes	No		This would be **useful** for clinical practice:	Yes	No		
	Good	OK	Poor	The **on-screen interactions/ animations** are:	Good	OK	Poor	
	Good	OK	Poor	The **images** are: (e.g. clear, engaging, appropriate)	Good	OK	Poor	

In balance



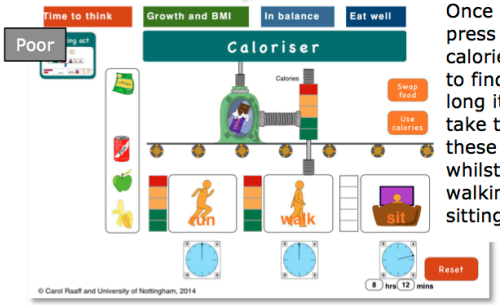
Do you agree with balance beam's tipping points?

Yes | No

What are your thoughts on the Activity Tracker?

Good | OK | Poor

This section is intended for 7 to 11-year-olds who ask about calories

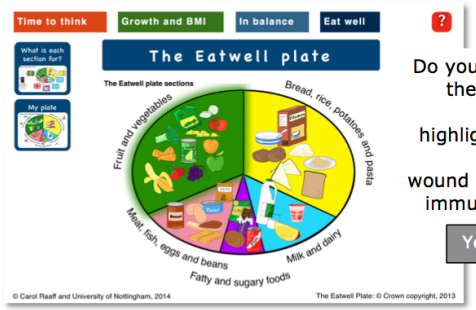


Help instructions: Once analysed, press the 'use calories' button to find out how long it would take to use these calories whilst running, walking or sitting

Comments:	*Balancing act*				*Caloriser*			*Comments*:
			I **tried using** this screen:					
			This is/would be **simple** to use:					
			This would be **useful** for clinical practice:					
			The **on-screen interactions/ animations** are:					
			The **images** are: (e.g. clear, engaging, appropriate)					

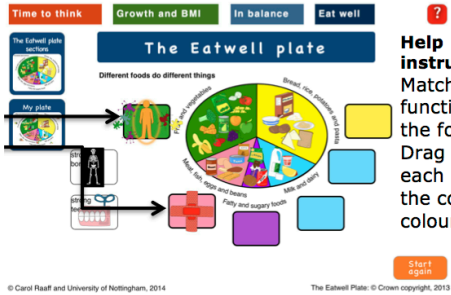
Eat Well (part 1 of 2)

Help instructions: Touch a section of the Eatwell Plate and discuss food preferences, nutrient benefits, and proportions of food groups, etc.



Do you agree with the food group functions highlighted here , e.g. wound healing and immune system?

Yes | No



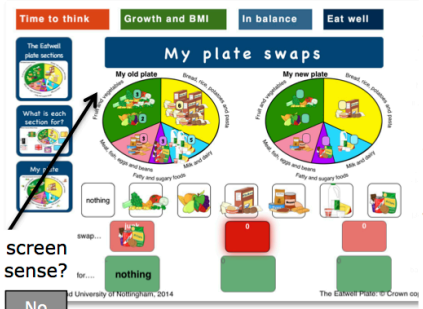
Help instructions: Match the health function with the food group. Drag and drop each picture into the correct coloured box

Comments:	*Eatwell plate sections*				*Eatwell nutritional value*			*Comments*:
	Yes	No	I **tried using** this screen:		Yes	No		
	Yes	No	This is/would be **simple** to use:		Yes	No		
	Yes	No	This would be **useful** for clinical practice:		Yes	No		
	Good	OK	Poor	The **on-screen interactions/ animations** are:	Good	OK	Poor	
	Good	OK	Poor	The **images** are: (e.g. clear, engaging, appropriate)	Good	OK	Poor	

Eat Well (part 2 of 2)

Help instructions: Carry out a paper-based 'typical day' scenario or 24-hour diet recall

Touch or drag the pictures onto the Eatwell Plate to show how many food group portions the child has each day



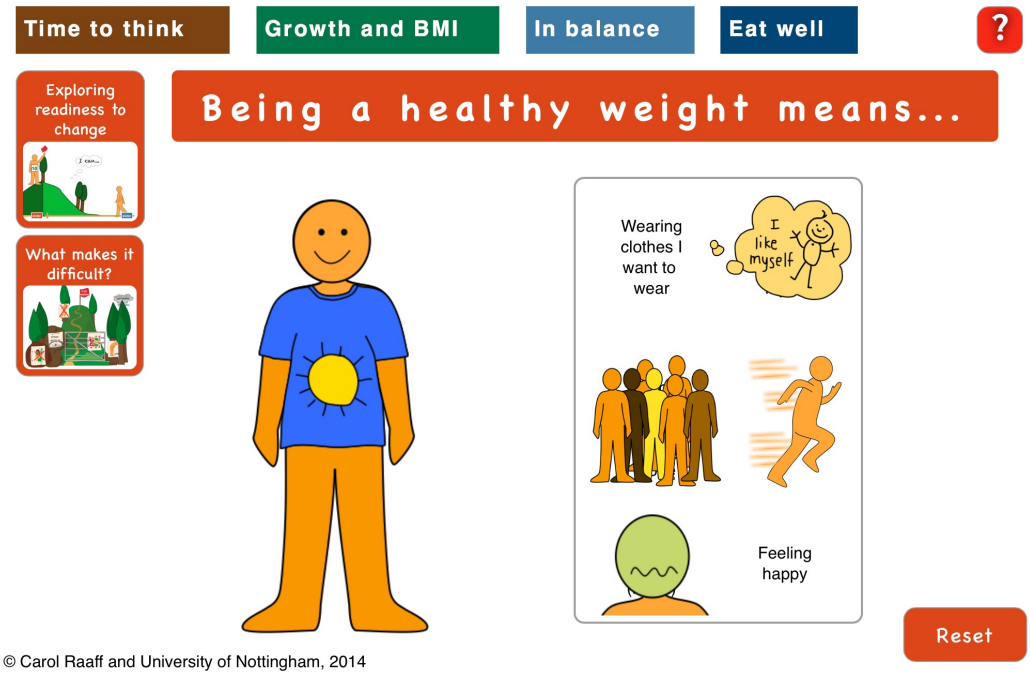
Help instructions: Discuss the number and distribution of food group portions on 'my old plate'

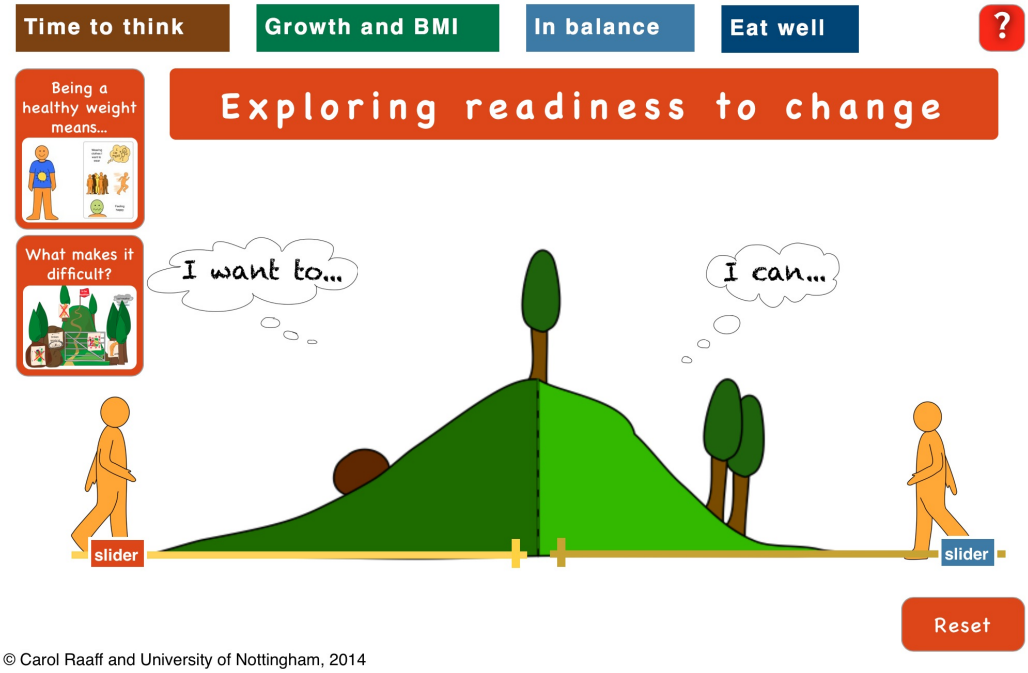
If appropriate, encourage the child to make 2 to 3 food group swaps

'My new plate' shows how these changes could affect the overall balance of the child's plate

Comments:	*My plate*				*My plate swaps*			*Comments*:
		Yes	No	I **tried using** this screen:	Yes	No		
		Yes	No	This is/would be **simple** to use:	Yes	No		
		Yes	No	This would be **useful** for clinical practice:	Yes	No		
	Good	OK	Poor	The **on-screen interactions/ animations** are:	Good	OK	Poor	
	Good	OK	Poor	The **images** are: (e.g. clear, engaging, appropriate)	Good	OK	Poor	

Appendix 16. *Feed-back* e-resource





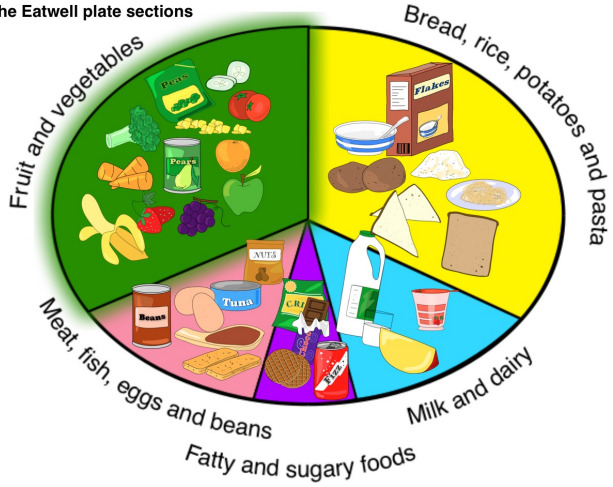
Time to think | Growth and BMI | In balance | Eat well | ?

What is each section for?

My plate

The Eatwell plate

The Eatwell plate sections



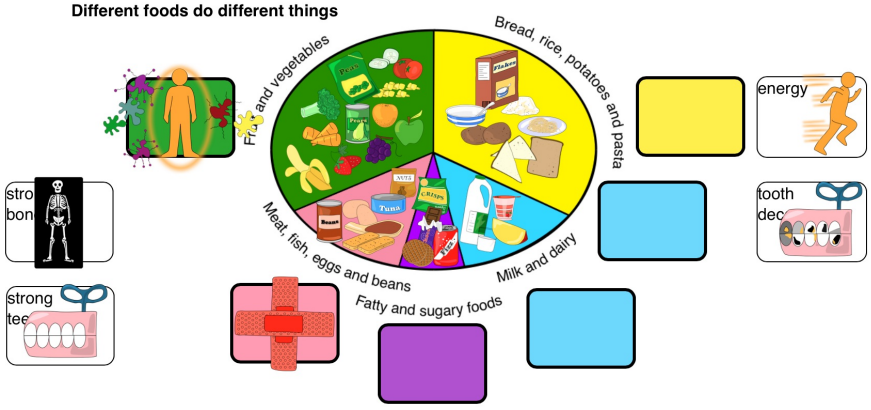
Time to think | Growth and BMI | In balance | Eat well | ?

The Eatwell plate sections

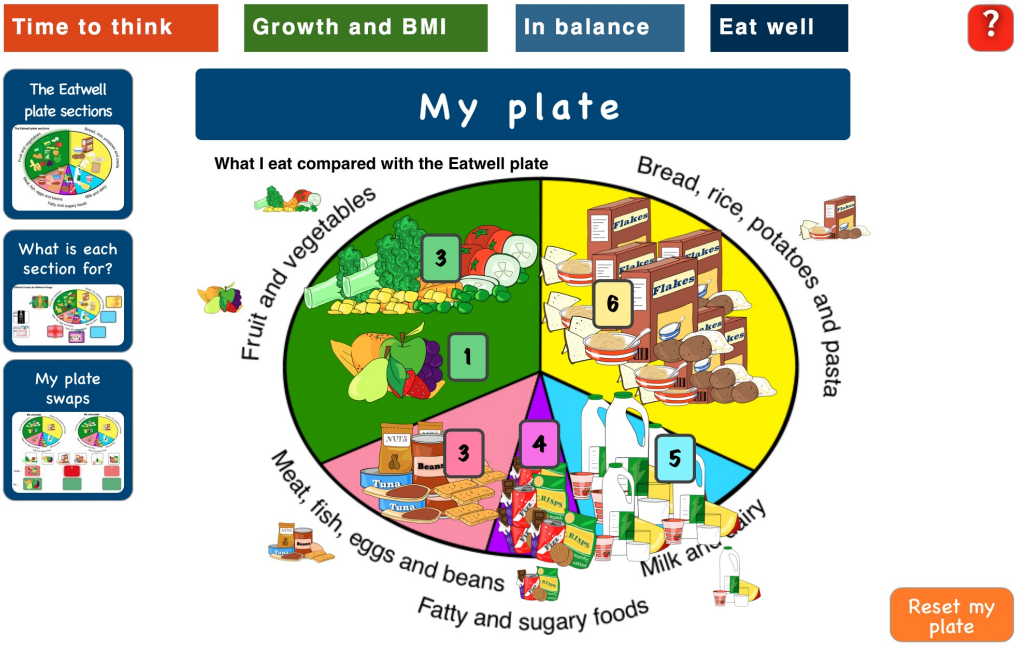
My plate

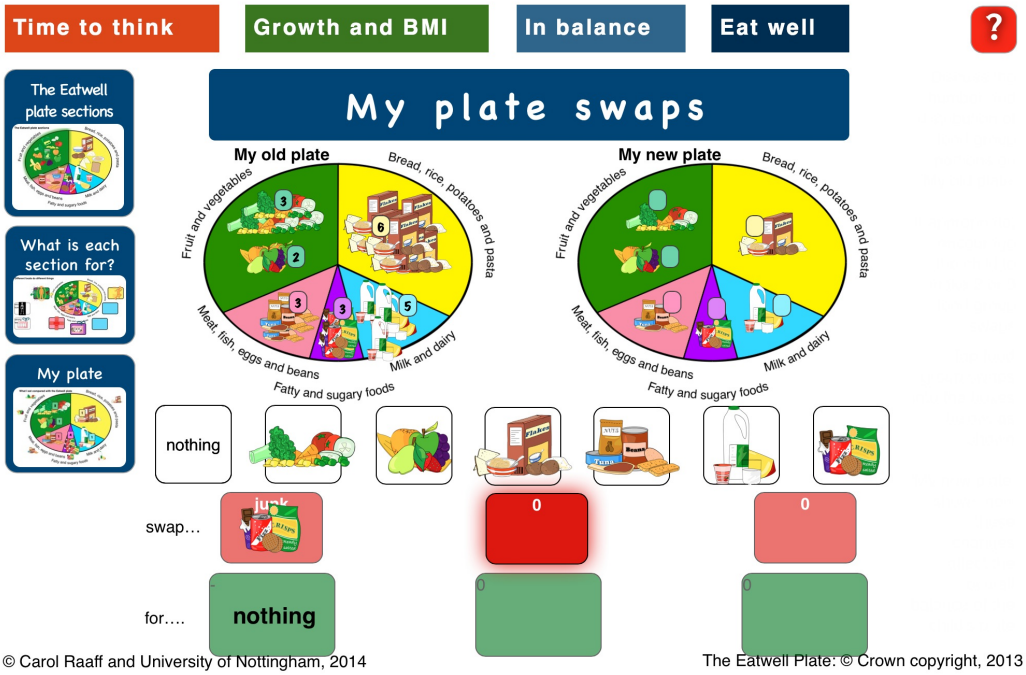
The Eatwell plate

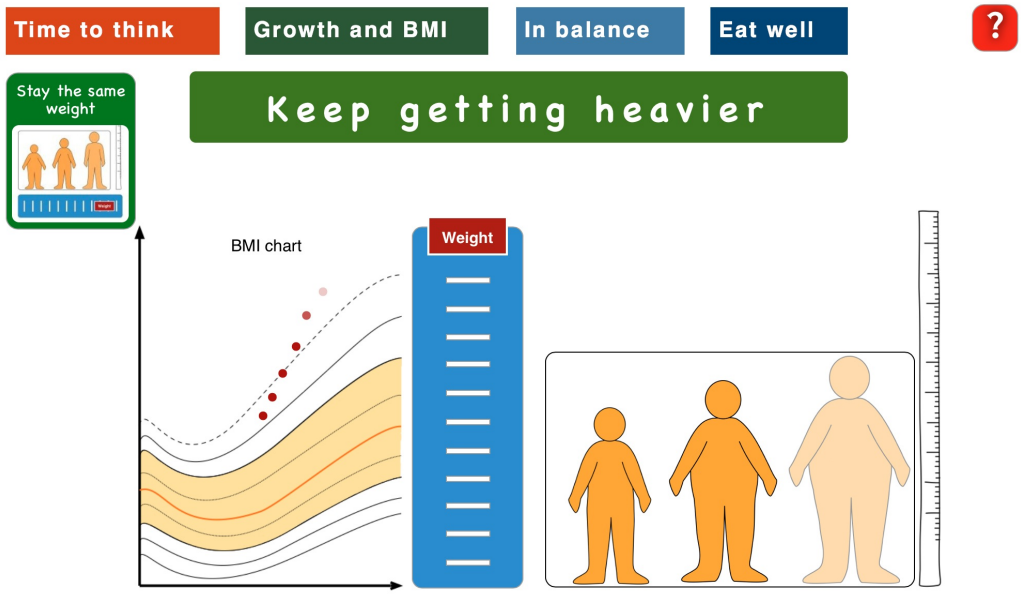
Different foods do different things

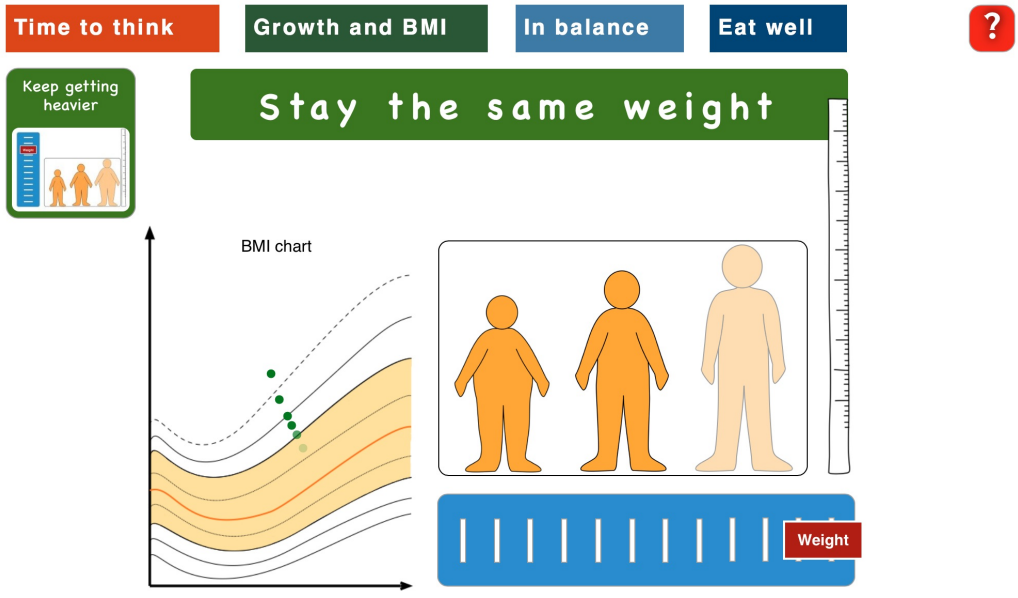


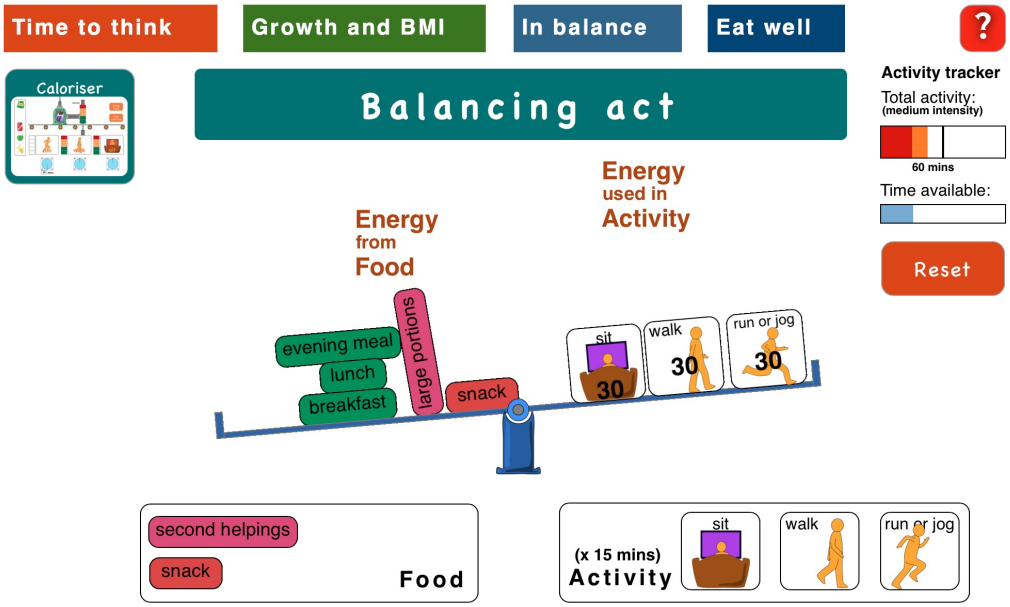
Start again

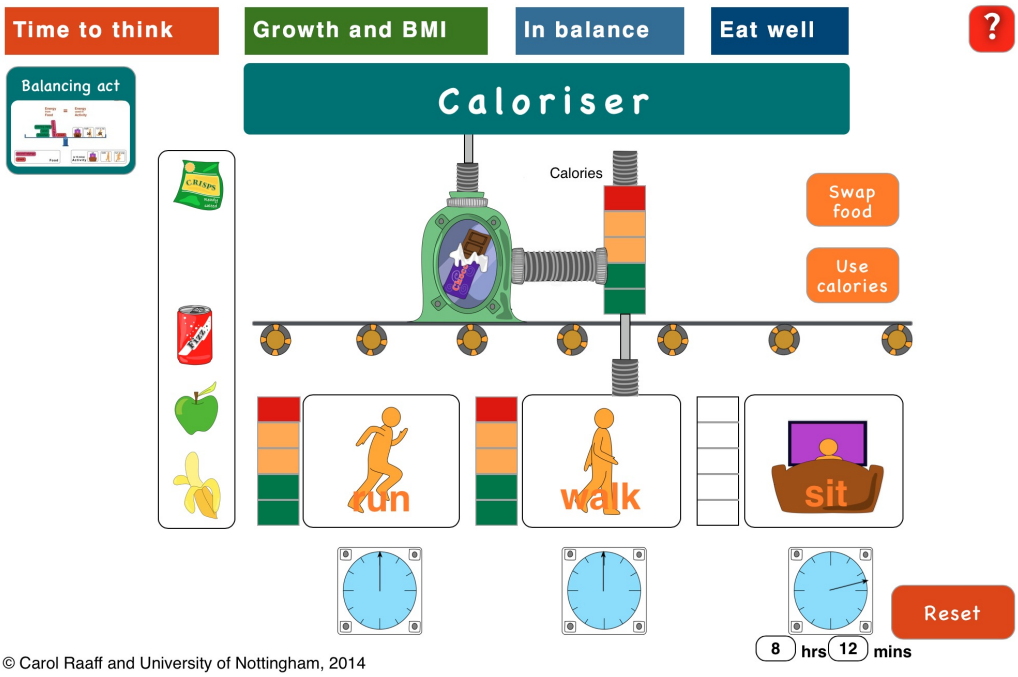












Appendix 17. Author field notes (Chapters Four and Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **The feasibility of using *Feed-back* (an e-resource) to facilitate communication within a child weight management consultation – *Phase 1***

Participant number: _____

Dietitian field notes/observations

Date of appointment: ____ / ____ / _____

Environment notes: _____

Venue, others present (siblings, parents, etc.), distractions, technical issues, etc.

Screens used: Tick all that apply

Time to Think	- *Being a healthy weight means…*	☐
	- *Exploring Readiness to Change*	☐
	- *What makes it difficult?*	☐
Growth and BMI	- *Keep getting heavier*	☐
	- *Stay the same weight*	☐
In Balance	- *Balancing act*	☐
	- *Caloriser*	☐
Eat Well	- *The Eatwell Plate sections*	☐
	- *The Eatwell Plate uses*	☐
	- *My plate*	☐
	- *My plate swaps*	☐

Discussion notes:

_____

_____

_____

Expected or unexpected? Note down comments or statements made by the child.

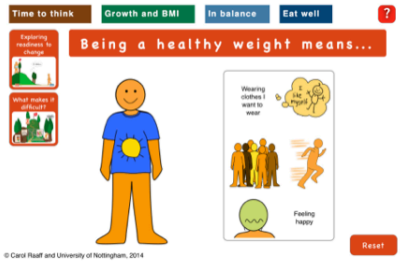
The role of the dietitian:

_____

_____

_____

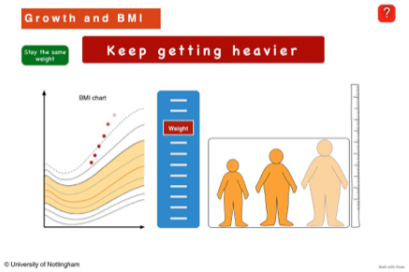
Consider the role of the facilitator in demonstrating, guiding, and using the onscreen interactions.



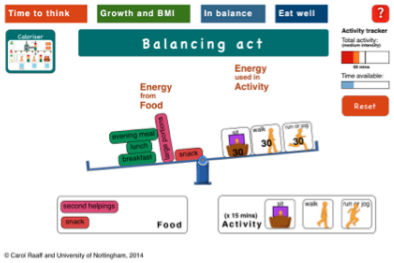
Time to Think – screen comments:

General comments:

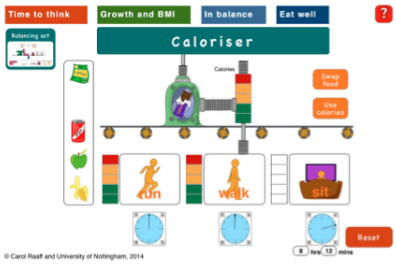
Growth and BMI – screen comments:



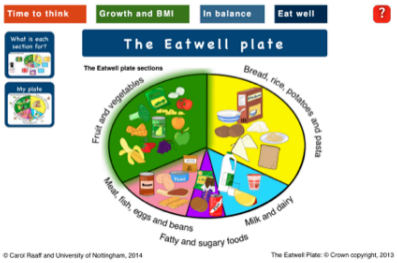
General comments:



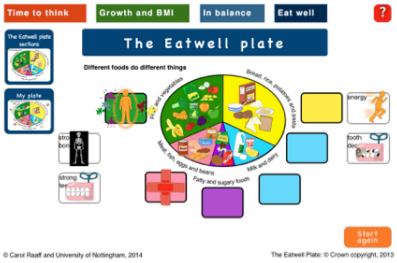
In Balance – screen comments:

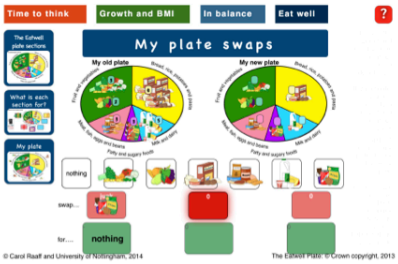


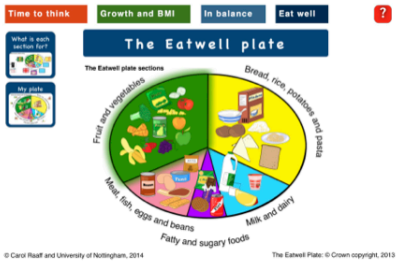
General comments:



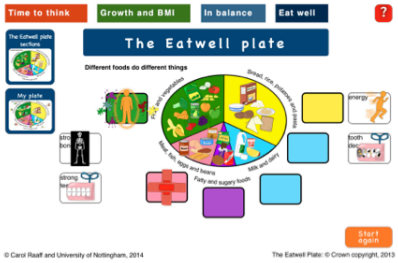
Eat Well – screen comments:

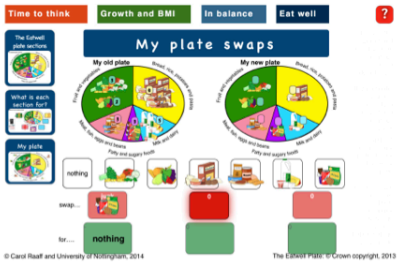




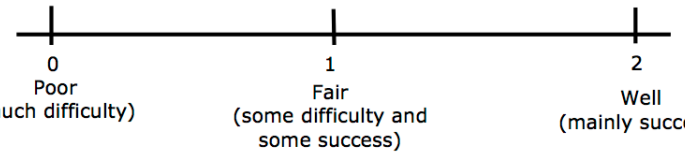


Eat Well – screen comments:

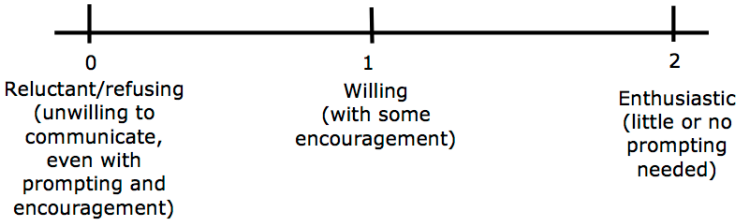




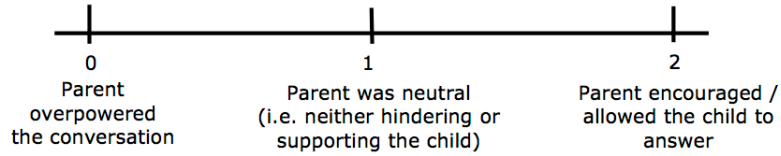
Overall, how well did you (as clinician) engage with the child?



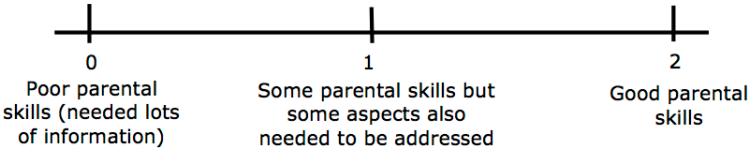
Child-willingness to engage (after the first 10 minutes)?



Parental support for child-involvement?



Perception of parental skills (e.g. parenting, cooking, relevant knowledge):



Signature: _____ Name: _____

Date: __ / __ / 20__ Time: _____ Designation: _____

Appendix 18. Parent information letter – non-patient child usability testing (Chapter Four)

Usability testing of the *Feed-back* app on a tablet (like an iPad) with 7 to 11 year olds

As you know, I am undertaking a PhD with the University of Nottingham. I would like to invite your child to take part in testing an app that I have developed. Before you decide, I would like to give you some information about what the app is for and what it would involve for your child.

The background – why have I developed the app?

Electronic visual aids (designed for tablet devices, like iPads) have not yet been used to help children to understand healthy eating, mainly because nothing suitable had been developed. However, young children seem to respond well to electronic images and interactive games and it seems logical to explore the potential usefulness of these resources in explaining healthy eating. I have developed an app for this reason.

The app, called *Feed-back*, is evidence-based and has been peer-reviewed (by other paediatric dietitians from across the UK). Before trying it in a clinic setting, I would like to find out whether the resource is usable by children, appeals to this age group and whether it conveys the health messages accurately and effectively. This is part of usability testing of the resource.

The children's responses and comments will be used to make any necessary changes to the app, before it is used in a small feasibility study with other children, in a clinical setting.

Why my child?

The *Feed-back* app has been developed for 7 to 11 year olds and so I am inviting children of this age group to help test its usability. I am hoping for between 15 children.

Do I have to?

Taking part is entirely voluntary. Your child is free to withdraw at any time (before or during the usability testing), without giving any reason, and without it being taken personally.

What will happen if my child takes part?

We will arrange a mutually convenient time for your child to come and play at our house for a few hours (or I can come to yours) in the next few weeks (you are welcome to sit in if you would like). They will:

- Answer three or four short questions verbally with me (and I will write them down). These questions are about health knowledge and should take a maximum of five minutes,
- Use the app for about 10 minutes, and
- Complete a few tick boxes about what they thought of the app, and verbally answer the same knowledge questions as they did at the start (that should take about five minutes). The questions will help me to

find out how useful the app is at communicating information, and how much (or how little) they enjoyed using the app (they will be encouraged to answer honestly).

What is the app about?

- The app has been designed to help overweight 7 to 11 year olds achieve a healthy weight. Weight management in children focuses on becoming healthier – healthy eating and physical activity. Most of the app is appropriate for most children. You can view the app at: http://dietitian-feed-back.weebly.com.

- One of the sections (*Growth and BMI*) would be not be suitable to discuss with your child because it looks at the effect of continued weight gain and weight maintenance (in an overweight child). This section *will not be shown* to your child.

- Children will only be shown the first and last screens in (*Time to Think*) as they are appropriate to all children – they are about what being a healthy weight means to them and potential difficulties in being or becoming 'healthier'.

What data will be collected?

I am only interested in finding out about what is useful and what isn't useful about the app. I am *not recording or collecting any personal details*, i.e. I *will not* be writing down or keeping your child's name, date of birth, gender, address, etc.

Further information and contact details

If you have any questions, or would like further information, please feel free to contact me (number below). If this is something you are happy to arrange with me, please give me a call or a text – I am aiming to have done all the usability testing by the 22 December 2014. Look forward to hearing from you.

Carol Raaff – 07952 076688

Thank you!

Appendix 19. National Research Ethics Committee (NRES) approval letter (Chapters Four and Five)

NHS
Health Research Authority
NRES Committee East Midlands - Nottingham 2
Royal Standard Place
Nottingham
NG1 6FS

Telephone: 0115 883 9435

29 December 2014

Professor Cris Glazebrook
Room B12, B Floor
Institute of Mental Health, University of Nottingham
Triumph Road, Nottingham
NG7 2TU

Dear Professor Glazebrook

Study title:	**The feasibility of using Feed-back (an e-resource) to facilitate triadic communication within a child weight management consultation**
REC reference:	**14/EM/1310**
Protocol number:	**14111**
IRAS project ID:	**169870**

Thank you for your letter of 18 December 2014. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 18 December 2014

Documents received

The documents received were as follows:

Document	*Version*	*Date*
Other [Response letter]	Final version 1.0	18 December 2014
Participant consent form [Consent form - Phase 1]	Final version 3.0	18 December 2014
Participant consent form [Consent form - Phase 2]	Final version 3.0	18 December 2014
Participant information sheet (PIS) [Parent PIS - Phase 1]	Final version 2.0	18 December 2014
Participant information sheet (PIS) [Parent PIS - Phase 2]	Final version 2.0	18 December 2014

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	*Version*	*Date*
Covering letter on headed paper [Covering letter]		03 December 2014
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Insurance letter]		30 July 2014
Interview schedules or topic guides for participants [Child Pre-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Interview schedules or topic guides for participants [Child Post-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Interview schedules or topic guides for participants [Child Pre-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Interview schedules or topic guides for participants [Child Post-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Letter from sponsor [Sponsor letter]		03 December 2014
Non-validated questionnaire [Parent Post-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Non-validated questionnaire [Parent Pre-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Non-validated questionnaire [Parent Pre-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Non-validated questionnaire [Parent Post-appt - Phase 1 & 2]	Final version 1.0	24 November 2014
Other [CRF - Phase 1]	Final version 1.0	24 November 2014
Other [CRF - Phase 2]	Final version 1.0	24 November 2014
Other [Field-notes - Phase 1]	Final version 1.0	24 November 2014
Other [Field-notes - Phase 2]	Final version 1.0	24 November 2014
Other [Data analysis - Phase 2]	Final version 1.0	24 November 2014
Other [Information Governance E-mail]		08 December 2014
Other [Field-notes - Phase 1]	Final version 1.0	24 November 2014
Other [Field-notes - Phase 2]	Final version 1.0	24 November 2014
Other [Response letter]	Final version 1.0	18 December 2014
Participant consent form [Consent form - Phase 1]	Final version 3.0	18 December 2014
Participant consent form [Consent form - Phase 2]	Final version 3.0	18 December 2014
Participant information sheet (PIS) [Child PIS - Phase 1]	Final version 1.0	24 November 2014
Participant information sheet (PIS) [Child PIS - Phase 2]	Final version 1.0	24 November 2014

Participant information sheet (PIS) [Parent PIS - Phase 1]	Final version 2.0	18 December 2014
Participant information sheet (PIS) [Parent PIS - Phase 2]	Final version 2.0	18 December 2014
REC Application Form [REC_Form_05122014]		05 December 2014
Research protocol or project proposal [Protocol]	Final version 1.0	24 November 2014
Summary CV for Chief Investigator (CI) [CV - Chief Investigator]	Final version 1.0	24 November 2014
Summary CV for student [CV - Investigator]	Final version 1.0	24 November 2014
Summary CV for supervisor (student research) [CV - Supervisor]	Final version 1.0	24 November 2014
Summary, synopsis or diagram (flowchart) of protocol in non technical language [Flow charts - Phase 1 & 2]	Final version 1.0	24 November 2014

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

14/EM/1310 **Please quote this number on all correspondence**

Yours sincerely

Lindsey Wallace
REC Assistant

E-mail: NRESCommittee.EastMidlands-Nottingham2@nhs.net

Copy to: *Mrs Carol Raaff*
Ms Angela Shone
Dr Hazel Mackey, Staffordshire and Stoke on Trent Partnership Trust

Appendix 20. NHS Research and development approval letter (Chapters Four and Five)

Staffordshire and Stoke on Trent Partnership NHS Trust

Mrs Carol Raaff
48 Thames Drive
Biddulph
Staffordshire
ST8 7HL

2nd Floor Morston House
The Midway
Newcastle-under-Lyme
Staffordshire
ST5 1QG

Tel: 0845 602 6772 x 1629
Fax: 01782 663 778
www.staffordshireandstokeontrent.nhs.uk

5th January 2015

Our Ref: IRAS 169870

Dear Mrs Raaff,

NHS PERMISSION FOR RESEARCH

Study title; The feasibility of using *feed-back* (an eresource) to facilitate communication within a child weight management consultation
Acronym:
Rec Reference;14/EM/1310
IRAS project number: 169870
Chief Investigator: Dr Cris Glazebrook
Sponsor; Angela Shone, University of Nottingham
Research site/Participant Identification Centre: Staffordshire and Stoke on Trent Partnership Trust child weight management clinics

We can confirm that the above project has been given NHS Permission for Research by the Research & Development Office for the Staffordshire and Stoke on Trent Partnership NHS Trust and the details entered on to the R&D database.

We note that this research project has been approved by **NRES Committee East Midlands-Nottingham 2** on **18th December 2014.**

NHS Permission for the above research has been granted on the basis described in the application form, Protocol and supporting documentation.

[insert name of person letter is addressed to]
[insert date using open punctuation
Permission is granted on the understanding that the study is conducted in accordance with the Research Governance Framework, ICH GCP, any other relevant legislation such as the Data Protection Act and NHS Trust policies and procedures.

Permission is only granted for the activities for which a favourable opinion has been given by the REC.

Conditions of NHS Permission
It is now a national initiative that the Trust is expected to recruit the first patient into a new study within 30 days. Please inform this office if you anticipate problems in achieving this for your study. The research Sponsor, Chief Investigator or the local Principal Investigator at the research site, may take appropriate urgent safety measures in order to protect research participants against any immediate hazard to their health or safety.

The R&D Office should be notified that such measures have been taken. The notification should also include the reasons why the measures were taken and the plan for further action.

The R&D Office should be notified within the same time frame of notifying the REC and any other regulatory bodies.

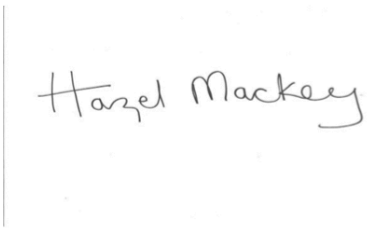
After NHS permission
All amendments including changes to the local research team need to be submitted in accordance with guidance in IRAS.

For further information regarding how to notify us of any amendments to the study please refer to the Amendments Guidance for Researchers found on the following web link:
http://www.crncc.nihr.ac.uk/researchers/amendments/

Please note that the NHS organisation is required to monitor research to ensure compliance with the Research Governance Framework and other legal and regulatory requirements. This will be achieved by random audit by our department.

We would like to take this opportunity to wish you well with your research. If you need any further advice or guidance please do not hesitate to contact us.

Yours sincerely



5th January 2015

.....	.....
Dr Hazel Mackey	Date of NHS Permission
Research Lead	

cc:
Chief Investigator
Sponsor

Appendix 21a. Child E-resource Satisfaction and Acceptability Measure (E-SAM) (Chapter Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 1 and Phase 2***

Participant number: _____

Child post-intervention questionnaire

Please answer the following questions. Tick **one** answer for each question.

1. *What do you think about the screens you have just used?*

Very bad | Bad | Good | Very good

2. *The app was:*

Very hard to understand | Hard to understand | Easy to understand | Very easy to understand

3. *Did you enjoy the app?*

No ☐ Yes ☐

4. *Did you want to carry on using the app?*

No ☐ Yes ☐

5. *Would you recommend the app to your friends?*

No ☐ Yes ☐

6. *What did you like about the app?*

_____

7. *What did you not like about the app?*

_____

Appendix 21b. Parent E-resource Satisfaction and Acceptability Measure (E-SAM) (Chapter Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **The feasibility of using Feed-back (an e-resource) on a tablet (like an iPad) to help communication within a child weight management consultation – *Phase 1 and Phase 2***

Participant number: _____

Parent post-intervention questionnaire

Please answer the following questions. Tick **one** box for each question.

1. Overall, how would you rate (or what do you think about) the app you have just used?

☐ Very poor ☐ Poor ☐ Good ☐ Very good

2. The app was:

☐ Very hard to understand ☐ Hard to understand ☐ Easy to understand ☐ Very easy to understand

3. How useful was the e-resource to the appointment?

☐ Completely useless ☐ Mostly useless ☐ Quite useful ☐ Very useful

4. Did you enjoy watching your child use the app?

No ☐ Yes ☐

5. Would you recommend that we use this sort of app in future appointments?

No ☐ Yes ☐

6. What did you like about the app?

_____

7. What did you not like about the app?

_____

Please continue to page 2...

Appendix 22a. Baseline Child Healthy Eating Knowledge Questions (CHEKQ) (Chapter Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 1 and Phase 2***

Participant number: _____

Child pre-intervention questionnaire

Questions for brief semi-structured interview, such as:

1. *What do you think healthy eating is?*

_____

_____

_____

2. *How could you be more healthy?*

_____

_____

_____

3. *What does it mean if you balance your energy?*

_____

_____

_____

_____

Thank you for your time.

Appendix 22b. Post-intervention Child Healthy Eating Knowledge Questions (CHEKQ) (Chapter Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 1 and Phase 2***

Participant number: _____

Child post-intervention questionnaire

Questions for brief semi-structured interview, such as:

1. *What have you learnt about healthy eating?*

_____

_____

_____

2. *How could you be more healthy – what have you learnt?*

_____

_____

_____

_____

3. *What does it mean if you balance your energy?*

_____

_____

_____

_____

Thank you!

Appendix 23. Triadic Communication Rating Scale (TRI-COM-RS) guideline (Chapter Five)

Background

The feasibility study aimed to explore acceptability of the e-resource in the clinical setting. Furthermore, the study sought to develop suitable outcome measures, to assess the impact of the intervention on the quality of triadic communication within the consultation. Pre and post-intervention questions captured change in child knowledge, and satisfaction questions helped to gauge acceptability of the e-resource amongst parent/carer(s) and children. This guide has been developed to support rating of the audio data collected during weight management consultations with 7 to 11 year old overweight children, and their parent/carer(s), using the *Feed-back* e-resource.

Each of the 15 consultations lasted between 17:22 and 36:44 minutes (mean=29:30±5:30). The children were between 7.27 and 11.97 years with the mean age of 9.82±1.75, and roughly half (n=8) were girls. Most (n=10) came with only their mother, one with their father, three had both parents in the appointment, and one child came with her grandmother. Verbal data have not been transcribed but extract samples (not necessarily word-for-word) have been provided to illustrate code categories. In each example, the speaker is placed within square brackets [], additional context may also be provided in *italics* and additional text has been added to some extracts to provide context or clarity, all of which are based on previous data within the interview, such as questions or previous statements. These additions appear in *italics* within square brackets []. For example:

> *[Parent]: "You've been doing other things, have you? To occupy yourself?" [Child]: "yeah, I've been doing other things like walking around the school…[the child continues to expand on exactly what happens]." [Child later adds]: "Sometimes I get told off for it."*

Extracts from participants P2/02 and P2/08 have also been included to hear examples 'in context'. The timings of these conversation extracts have been included to facilitate listening to the audio file.

Two main categories are rated: child participation and parent participation.

Rating instructions

Rating involves firstly listening to the child and parent's contribution to the conversation and counting instances of speech that correspond to items on the scale. Secondly, at the end of the recording, a final judgement needs to be made, to allocate a 'No', 'Somewhat' or 'Yes' rating to each listed item.

Knowing how to count an 'episode' or 'turn' of contribution is important. Non-lexical utterances such as 'ummmm' or 'hmmmm' or 'huh' are not considered significant verbal contributions to the conversation on their own but they may be the start of a 'turn'. Their turn ends when they come to the end of what they are trying to say and they stop talking. This may be when they are interrupted, or as someone else starts their turn. If there is

a relatively long gap or pause in their contribution, but they then begin talking again (without another person taking over), their turn continues until they have come to the end of what they are trying to say and they stop talking.

1. Child contribution

1.1 Child engages in the conversation:

Engaging in a conversation goes beyond answering 'yes' or 'no' to questions, it relates to becoming involved in the conversation, by expressing emotion and preferences (or interests), disagreeing, interrupting, making suggestions or recommendations, and accepting an alternative view point (among other things). The tone in the child's voice may also play a role in whether their contribution demonstrates active engagement. If their response is emphasised or they speak with surprise, delight or enthusiasm, this would be rated as an instance of active participation because they are playing an active role in the conversation.

Seeking information, or asking questions, demonstrates active engagement. By asking a question, the child may be admitting to a lack of understanding, wish to clarify existing information, or be seeking additional information.

See *Addendum – child engagement* for detailed inclusion and exclusion descriptors, and extract examples.

Extracts – P2/02 1.22 sec: "Loads better!"
1.40 sec: "Yeah, 'cos it took us about 25 minutes…"
4.37 sec: "And a massive orange for my lunch…"
5.07 sec: "I don't like carrot sticks anyway."
21.08 sec: "It's in balance."

1.2 Child disengages with the conversation:

Disengagement is rated when the child appears disinterested in the verbal discourse. This is evidenced by inappropriate interruptions, making comments or giving responses that are unrelated to the conversation, needing additional prompts to answer or respond. Disruptions and inappropriate contributions should also be rated as disengagement. Note that this is different to needing additional prompts because of an existing learning difficulty. (Some participants have mild learning difficulties, and are in receipt of additional support at school – this has been indicated next to their participant number towards the end of this document.) The rater's discretion should be used in these instances.

Extracts – P2/08 34.30 sec: Banging noises on counter
27.37 sec: "I forgot."
35.20 sec: "Have we been recording now, half-an-hour and three minutes?"

1.3 Child plays a role in goal-setting and decision-making:

This involves the child making his or her own suggestions or recommendations in relation to goal-setting. In making suggestions or recommendations, the child demonstrates their initiative in finding a solution to a problem. These may be asked for or spontaneously given.

He or she may also come up with their own decision about something, or an independent observation.

Example – [Dietitian]: "And what happens if it is raining?" [Child]: "I could put my waterproofs on."
[Dietitian *referring to an interaction shown on the e-resource*]: "What do you think about that?" [Child]: I am going to cut down on the amount of sugary things I eat."
[Child *unprompted, when using the e-resource*]: "[*I'll*] try walking."
[Child *unprompted, when using the e-resource, and following interaction with one of the animations*]: "six minutes."

Extract – P2/02 31.15 sec: "Walk a bit faster?"
P2/08 33.20 sec: "Maybe have a piece of fruit?"

2. Parent contribution

2.1 Parent tries to include the child during parent contributions:

This item tends to occur during exchanges between the parent or carer and the dietitian. The parent demonstrates a commitment to partnership working with the child by trying to include the child in their conversation with the dietitian. This may be done through the words that they use, making the conversation accessible to the child. The parent may use the words 'we' or the phrases 'don't we', 'don't you', 'isn't it' when providing information to the dietitian, as a means of helping the child feel part of the conversation. This may also be done by using relevant or familiar concepts that the child can relate to, and that may or may not lead to the child taking up that invitation to join the dialogue.

Extract – P2/08 32.48 sec: "We usually say half-an-hour when we come in from school, don't we? …"
33.25 sec: "You have a yoghurt, though, don't you? You have a yoghurt…"
P2/02 6.47 sec: "Still a problem at big nan's *i'n't*? Because she doesn't see is as much of a problem, does she?"
31.48 sec: "Because we are all hibernating after school… I don't know 15 minutes on my treadmill…"

2.2 Parent insensitive to the child's or their contribution:

Insensitivity relates to parent contributions that devalue the child, undermining or contradicting them in some way. These comments may be true but not necessary to have said them in a negative way. These types of parent contributions are a form of criticisms that can lead to a lower sense of self-worth, which may in turn a lower the level of participation in future exchanges.

Extract – P2/02 1.47 sec: "I think she might have a bit of a dawdle on…"
2.50 sec: "It's the stop button, [child's name]…"

2.3 Parent intrusiveness:

Insensitivity relates to interrupting, answering for the child (without leaving space for him or her to answer), talking over the child and/or making inappropriate or distracting comments. All of these types of parent contributions can inhibit child participation because they leave less room for the child to be heard. Parental intrusiveness can lead to the child feeling overpowered in the conversation and may lead to a lower level of participation in the conversation.

Extract – P2/02 1.15 sec: "Um, it's the low fat margarine."
2.57 sec: "Well, I think she is…"

2.4 High level of parental need for their own health-related conversation:

This relates to the parent or carer initiating conversations about diet or health-related concerns. Contributions may be in the form of questions or comments made by the parent, and may be relate to themselves but is more often about the child, as they seek to support the child to manage their weight. Parents may wish to find out more about food composition, physical activity levels, or more complex energy balance information. Conversations of this type tend to exclude the child, and may or may not eventually draw the child in. While child weight management appointments seek to satisfy the needs of the child and his or her parent, the more time given to discuss parental concerns (however valid and useful), the less time will be available for child contribution.

Extract – P2/02 29.39 sec: "How much do you think…"
32.30 sec: "Trying to find ways…financial constraints."

Calculating a score rating

Having kept a tally of the score for each item, making a rating judgement is required. This is done in the following way.

0 = No

This score is achieved when there are zero or one examples of this item in the recording.

1 = Somewhat

A 'somewhat' score is identified when there are from two to Five examples, i.e. 2 to 4 inclusive.

2 = Yes

A 'yes' score is rated when five or more extracts have been identified as falling into this category.

Addendum – child engagement

Categories:

1. Child – seeking information
2. Child – giving information
    2.1 Appropriate expressions of preferences, interests, and spontaneous contributions

2.2 Descriptions of how the child is feeling
2.3 Expressions of appropriate emotion
2.4 Self-aware and self-affirming statements
2.5 Disagreeing and challenging
2.6 Starting to talk (appropriately) when the parent or dietitian is already talking
2.7 Accepting an alternative opinion or view point
2.8 Attempts to clarify their position

1. Child – seeking information

Description – Seeking information, or asking questions, demonstrates active engagement. By asking a question, the child may be admitting to a lack of understanding, wish to clarify existing information, or be seeking additional information.

Look for – All types of seeking information, from asking questions about the appointment structure, to e-resource interactivity and user interface queries, as well as questions about diet, physical activity and lifestyle. The question need not relate to what the parent or the dietitian have raised or are discussing. Seeking information also includes clarifying information and probing deeper into a topic that is being discussed.

Example – [Parent]: "…grapes, pomegranate seeds, strawberries…"
[Child]: "What are pomegranates?"
[Child *referring to something on the e-resource*]: "Is that cheese?"
[Child *asking the dietitian to repeat something because she was talking and hadn't heard the questions*]: "Mmmmm?"

Exclusion – Seeking information is not usually in response to a question, but usually originates from the child, rather than from the dietitian or the parent. The tone of the child's voice can be misleading, as a child who is unsure of the 'expected' or 'correct' response may provide an answer that sounds like a question (as if to ask, is this correct?). Considering what has preceded the child's response can be very helpful. If they have been asked a question, and the verbal content of their response sounds like an attempt to answer, this *is not* active participation.

Example – [Dietitian]: "Which *[food]* group does that fit into?" [Child]: "Milk and dairy?"
[Child]: "…Nachos…I think…oats?"

Exclusion – Diverting the question to the parent is not actively contributing to the consultation. By directing the question to their parent, they are trying to involve the parent on their behalf. This *is not* active participation.

Example – [Dietitian]: "What did you have for your tea?" [Child]: "What did I have for tea, mum?"

2. Child – giving information

Description – Engaging in a conversation goes beyond answering 'yes' or 'no' to questions, it is about becoming involved in the conversation, by expressing emotion and preferences (or interests), disagreeing, interrupting, making suggestions or recommendations, and accepting an

alternative view point (among other things). The tone in the child's voice may also play a role in whether their contribution demonstrates autonomous engagement. If their response is emphasised or speak with surprise, delight or enthusiasm, this would be rated as they are playing an active role in the conversation.

2.1 Expressions of preferences, interests, and spontaneous contributions:

Look for – Preferences (or dislikes) of food or types of physical activity, the e-resource, or anything else within the appointment. These are spontaneous statements, and would include unprompted observations, and a willingness to provide further background or insight into areas of their school or home life, thought processes, etc. These are all contributions that could help the dietitian tailor future communication with the child (either the way in which information is provided or during goal-setting).

Example – [Child *referring to something on the e-resource*]: "I like that."
[Child]: "Yuk"
[Child *statement, not in response to a question*]: "I really like carrots."
[Parent]: "You've been doing other things, have you? To occupy yourself?" [Child]: "yeah, I've been doing other things like walking around the school…[*the child continues to expand on exactly what happens*]." [Child *later adds*]: "Sometimes I get told off for it."
[Dietitian]: "If you could choose and [*food*] you wanted, what would you choose?" [Child]: "It's between crisps and a coke. Not a chocolate bar because that fills me up."

Exclusions – Following an instruction or a straightforward response to a question about the foods or types of physical activity the child prefers. Other exclusions include lists of items because of a question from the parent or the dietitian.

Example – [Dietitian]: "Which types of fruit do you eat?" [Child]: "I like grapes, strawberries…"
[Dietitian]: "Pick one [*food*]." [Child]: "Cake."
[Dietitian]: "What did you tell me about that group?"
[Child]: "That it was getting a bit big."

2.2 Descriptions of how the child is feeling:

Look for – Autonomous insights and expressions of how the child is feeling. This will often contain a 'because', to provide further information about why they feel the way they do. Spontaneous contributions (without significant reflections on how or why they feel the way they do) about changes to their diet, physical activity, and/or weight would also be rated. It may be how the child responds to a question that demonstrates the extent of feeling towards something.

Example – [Dietitian]: "So, how are you feeling?" [Child]: "I feel a lot better."
[Dietitian]: "Which one would you choose?" [Child]: "Ooooooooh……chocolate."

Exclusions – Responding to a leading question without conviction or depth.

Example – [Dietitian]: "So are you feeling better?" [Child]: "I probably am, I think."

2.3 Expressions of emotion:

Look for – Expressions emotion relating to food or types of physical activity, the e-resource, or anything else within the appointment. These are usually spontaneous statements.

Example – [Child]: "Cool!" or "Yay!" or "Woaw."

Exclusions – Laughter, copying sounds generated by the e-resource, verbal following, or mirroring speech patterns of either the parent/carer, or the dietitian.

Example – [Child]: "…tick-tock, tick-tock…" or "See-saw…"

Exclusions – Unrelated expressions of emotion, that serve to disrupt rather than to contribute to the conversation.

Example – [Child]: "Ouaw!" or "Irrrrrrrrrrrrr"

2.4 Self-aware and self-affirming statements:

Look for – Assertive statements such as what they are good at or what they do well, and what they are not good at. These are usually related to a question but the child's response demonstrates their belief about their own ability – positive or negative, e.g. 'it has to be…'. These types of statements also demonstrate an awareness of their own limitations or their role within the family.

Example – [Dietitian]: "So, would you do some running after school?"
[Child]: "I am really good at running. I can run really fast."
[Child]: "Obvious…it says rice!" or "It has to be more than one hour."
[Dietitian]: "Do you know what you are having for dinner tonight?" [Child]: "You have to ask mummy, normally?"

Exclusions – Responses to questions that ask the child directly about their belief in their ability.

Example – [Dietitian]: "Are you good at running?" [Child]: "I am really good at running. I can run really fast."

2.5 Disagreeing and challenging:

Look for – Child responses that show disagreement to a *statement* that has been made by either the parent or the dietitian. This goes beyond answering 'no' to a neutral question, it captures the ability of the child to contradict an adult when he or she believes that the information that has been conveyed is incorrect, and the confidence to put it right. Autonomous engagement may be conveyed through a marked emphasis on the way the response is made – emotions can evidence engagement in the conversation (this overlaps with the other coding category of '*expressions*

of emotion'. They are engaged enough in the conversation to care about what is being said and prepared to correct misinformation. Furthermore, a child's statement or a response, in spite of previous (associated) discouragement from the dietitian or parent, is another example verbal autonomy.

Example – [Parent]: "See, you don't even know what you have in your lunchbox today" [Child]: "Grapes…orange…"
[Child *following a pause after a parent had given information*]: "No, I didn't!"
[Dietitian]: "Do you mean a honeydew melon?" [Child]: "No!"

Exclusions – Responses to closed questions, that could conceivably require 'yes'/'no' answer.

Example – [Dietitian]: "Do you like oranges?" [Child]: "No, I don't."
[Dietitian]: "Do you mean a honeydew melon?" [Child]: "No."
[Dietitian]: "Do you do any activities after school?" [Child]: "Not really, no."

2.6 Starting to talk when the parent or dietitian is already talking:

Look for – A child starting to speak, when another person is already speaking, is rated as it usually indicates that the child believes they have something more important to say than the person who is currently. The child is trying to make him or herself heard. This may be as a result of their personality, age, or in response to a lack of opportunity to take part in the conversation.

If the child is trying to speak and they are not being listened to, leading to them waiting a few seconds before trying again, rate this attempt to make themselves heard. Even if they have had to repeat themselves briefly so that others can understand them, this should only be rated once (as it is one 'turn').

The child completing another person's turn or contribution is another form of autonomous engagement, provided their contribution is not anticipated.

Example – [Child *while at least one other person is talking*]: "I don't want…I don't want… [*other people/person stops talking*] I don't want to have breakfast in the morning."
[Parent]: "Because if you have the chocolate, and you don't do the walking, it's just going to…" [Child]: "…build up."
[Parent]: "They have a 20 minute break when they have a snack to…" [Child]: "Keep going."

Exclusions – Interruptions that are never 'heard'. If the child loses the battle to make themself heard and stop partway through their attempt, or do not try again if the other adults have clearly not heard them (these include 'unheard' first attempts). Similarly, by interjecting another person's speech with 'yeah' or 'uhmmm' or similar non-lexical utterances, the child is encouraging that person in their contribution, rather than intending to interrupt their turn.

2.7 Accepting an alternative opinion or view point:

Look for – If a child has made a statement and they been proved wrong, or realise that their parent (or the dietitian) is correct and they are not. This may be an implied verbal admission of error, e.g. "oooh" or "oops", and includes changing their mind about something, either spontaneously or as a result of information that has been given to them.

Example – [Child *(not rated)*]: "I don't do much walking:" [Parent]: "You do lots of walking. We walk everywhere." [Child *(rated)*]: "Oh, yeah. We do."
[Child *(not rated)*]: "Half-seven." [Parent]: "Half-seven?…"
[Child *(rated)*]: "Or quarter-to-eight."

2.8 Attempts to clarify their position:

Look for – The child's attempt to clarify their position on a matter. This usually involves providing more detailed information than has been asked for (particularly following closed or leading questions).

Example – [Dietitian]: "So you don't like the tomatoes?" [Child]: "Cherry tomatoes."
[Dietitian]: "So, with the juices, you don't have a problem with that?" [Child]: "Not any more, no."

Exclusions – A situation in which the adult asks the child to repeat to clarify an interruption that wasn't heard clearly, or explain something further.

Example – [Dietitian]: "Sorry?" [Child]: "It says it's perfect for lunchboxes."

Appendix 24. Child Contribution Coding System (CCCS) codebook (Chapter Five)

Background

The feasibility study aimed to explore acceptability of the e-resource in the clinical setting. Furthermore, the study sought to develop suitable outcome measures, to assess the impact of the intervention on the quality of triadic communication within the consultation. Pre and post-intervention questions captured change in child knowledge, and satisfaction questions helped to gauge acceptability of the e-resource amongst parent/carer(s) and children. This codebook has been developed to analyse an aspect of the audio data collected during weight management consultations with 7 to 11 year old overweight children, and their parent/carer(s), using the *Feed-back* e-resource.

Each of the 15 consultations lasted between 17:22 and 36:44 minutes (mean=29:30±5:30). The children were between 7.27 and 11.97 years with the mean age of 9.82±1.75, and roughly half (n=8) were girls. Most (n=10) came with only their mother, one with their father, three had both parents in the appointment, and one child came with her grandmother. Verbal data have not been transcribed but have been analysed 'live' using behaviour observation software (BORIS). Extract samples (not necessarily word-for-word) have been provided to illustrate code categories. In each example, the speaker is placed within square brackets [], additional context may also be provided in *italics* and additional text has been added to some extracts to provide context or clarity, all of which are based on previous data within the interview, such as questions or previous statements. These additions appear in *italics* within square brackets []. For example:

> *[Parent]*: "You've been doing other things, have you? To occupy yourself?" *[Child]*: "yeah, I've been doing other things like walking around the school…[the child continues to expand on exactly what happens]." *[Child later adds]*: "Sometimes I get told off for it."

Two main code types have been identified: *child – seeking information* and *child – giving information*. *Giving information* is in turn comprised of nine descriptors to aid analysis of this code. Each has been defined through inclusion and exclusion criteria. Accurate timing and correct labelling of these child contributions are equally important.

Coding instructions

Autonomous engagement, from the child, may occur throughout the audio-recording. '*Child-giving info*' and '*child-seeking info*' are both timed events. In other words, they have a start and an end time.

Knowing when to 'start' and 'stop' is important. When a child's response starts with 'mmm', or 'ummm', coding should not start until they make a more substantial verbal contribution on that turn. Some children have 'turns' that never progress beyond a non-lexical utterance, saying no more than 'mmmm', or they use that time to think about their response. Coding should only start when a verbal contribution is made to the conversation. Their turn ends when they come to the end of what they are trying to say

and they stop talking. This may be when they are interrupted, or as someone else starts their turn. If there is a relatively long gap or pause in their contribution, but they carry on talking without another person taking over, their turn continues until they have come to the end of what they are trying to say and they stop talking. If another adult encourages their contribution with non-lexical utterances or two words or less (contracted words, such as 'that's', 'hasn't' and 'OK' are classified as single words):

[Child]: "…grapes…" *[Dietitian]*: "Yes." *[Child]*: "…apples…" *[Dietitian]*: "Yes." *[Child]*: "…strawberries…" *[Dietitian]*: "Yes." *[Child]*: "…and pears."

Time exclusions have already been inputted. These include time spent setting up the e-resource, dealing with technical problems or distractions, setting aside the e-resource and turning the audio off (and in some cases on as well). There is no need to code these events. This codebook relates to logging instances of child contribution only, and more specifically: occurrences of their verbal autonomous engagement.

1. Code: Child – seeking information

Description – Seeking information, or asking questions, demonstrates active engagement. By asking a question, the child may be admitting to a lack of understanding, wish to clarify existing information, or be seeking additional information.

Look for – All types of seeking information, from asking questions about the appointment structure, to e-resource interactivity and user interface queries, as well as questions about diet, physical activity and lifestyle. The question need not relate to what the parent or the dietitian have raised or are discussing. Seeking information also includes clarifying information and probing deeper into a topic that is being discussed.

Example – *[Parent]*: "…grapes, pomegranate seeds, strawberries…"
[Child]: "What are pomegranates?"
[Child referring to something on the e-resource]: "Is that cheese?"
[Child asking the dietitian to repeat something because she was talking and hadn't heard the questions]: "Mmmmm?"

Exclusion – Seeking information is not usually in response to a question, but usually originates from the child, rather than from the dietitian or the parent. The tone of the child's voice can be misleading, as a child who is unsure of the 'expected' or 'correct' response may provide an answer that sounds like a question (as if to ask, is this correct?). Considering what has preceded the child's response can be very helpful. If they have been asked a question, and the verbal content of their response sounds like an attempt to answer, this *should not* be coded as 'seeking information'.

Example – *[Dietitian]*: "Which *[food]* group does that fit into?" *[Child]*: "Milk and dairy?"
[Child]: "…Nachos…I think…oats?"

Exclusion – Diverting the question to the parent is not actively contributing to the consultation. By directing the question to their parent, they are trying to involve the parent on their behalf. This *should not* be coded as 'seeking information'.

Example – *[Dietitian]*: "What did you have for your tea?" *[Child]*: "What did I have for tea, mum?"

Exclusion – Giving information by asking a question. While this *would not* be coded as 'seeking information', it is autonomous engagement and, and therefore should be coded as 'giving information'.

Example – *[Child]*: "Well, do you know why I didn't like the broccoli?" *[Dietitian]*: "Why?" *[Child]*: Because it had snot on it."

2. Code: Child – giving information

Description – Engaging in a conversation goes beyond answering 'yes' or 'no' to questions, it is about becoming involved in the conversation, by expressing emotion and preferences (or interests), disagreeing, interrupting, making suggestions or recommendations, and accepting an alternative view point (among other things). The tone in the child's voice may also play a role in whether their contribution demonstrates autonomous engagement. If their response is emphasised or speak with surprise, delight or enthusiasm, this would be coded as autonomous engagement because they are playing an active role in the conversation.

2.1 Expressions of preferences, interests, and spontaneous contributions:

Look for – Preferences (or dislikes) of food or types of physical activity, the e-resource, or anything else within the appointment. These are spontaneous statements, and would include unprompted observations, and a willingness to provide further background or insight into areas of their school or home life, thought processes, etc. These are all contributions that could help the dietitian tailor future communication with the child (either the way in which information is provided or during goal-setting).

Example – *[Child referring to something on the e-resource]*: "I like that."
[Child]: "Yuk"
[Child statement, not in response to a question]: "I really like carrots."
[Parent]: "You've been doing other things, have you? To occupy yourself?" *[Child]*: "yeah, I've been doing other things like walking around the school…*[the child continues to expand on exactly what happens]*." *[Child later adds]*: "Sometimes I get told off for it."
[Dietitian]: "If you could choose and *[food]* you wanted, what would you choose?" *[Child]*: "It's between crisps and a coke. Not a chocolate bar because that fills me up."

Exclusions – Following an instruction or a straightforward response to a question about the foods or types of physical activity the child prefers. Other exclusions include lists of items because of a question from the parent or the dietitian.

Example – *[Dietitian]*: "Which types of fruit do you eat?" *[Child]*: "I like grapes, strawberries…"
[Dietitian]: "Pick one [*food*]." [Child]: "Cake."
[Dietitian]: "What did you tell me about that group?"
[Child]: "That it was getting a bit big."

2.2 Descriptions of how the child is feeling:

Look for – Autonomous insights and expressions of how the child is feeling. This will often contain a 'because', to provide further information about why they feel the way they do. Spontaneous contributions (without significant reflections on how or why they feel the way they do) about changes to their diet, physical activity, and/or weight would also be coded. It may be how the child responds to a question that demonstrates the extent of feeling towards something.

Example – *[Dietitian]*: "So, how are you feeling?" *[Child]*: "I feel a lot better."
[Dietitian]: "Which one would you choose?" *[Child]*: "Ooooooooh……chocolate."

Exclusions – Responding to a leading question without conviction or depth.

Example – *[Dietitian]*: "So are you feeling better?" *[Child]*: "I probably am, I think."

2.3 Expressions of emotion:

Look for – Expressions emotion relating to food or types of physical activity, the e-resource, or anything else within the appointment. These are usually spontaneous statements.

Example – *[Child]*: "Cool!" or "Yay!" or "Woaw."

Exclusions – Laughter, copying sounds generated by the e-resource, verbal following, or mirroring speech patterns of either the parent/carer, or the dietitian.

Example – *[Child]*: "…tick-tock, tick-tock…" or "See-saw…"

Exclusions – Unrelated expressions of emotion, that serve to disrupt rather than to contribute to the conversation.

Example – *[Child]*: "Ouaw!" or "Irrrrrrrrrrrrr"

2.4 Self-aware and self-affirming statements:

Look for – Assertive statements such as what they are good at or what they do well, and what they are not good at. These are usually related to a question but the child's response demonstrates their belief about their own ability – positive or negative, e.g. 'it has to be…'. These types of statements also demonstrate an awareness of their own limitations or their role within the family.

Example – *[Dietitian]*: "So, would you do some running after school?"
[Child]: "I am really good at running. I can run really fast."
[Child]: "Obvious…it says rice!" or "It has to be more than 1 hour."
[Dietitian]: "Do you know what you are having for dinner tonight?" *[Child]*: "You have to ask mummy, normally?"

Exclusions – Responses to questions that ask the child directly about their belief in their ability.

Example – *[Dietitian]*: "Are you good at running?" *[Child]*: "I am really good at running. I can run really fast."

2.5 Disagreeing and challenging:

Look for – Child responses that show disagreement to a *statement* that has been made by either the parent or the dietitian. This goes beyond answering 'no' to a neutral question, it captures the ability of the child to contradict an adult when he or she believes that the information that has been conveyed is incorrect, and the confidence to put it right. Autonomous engagement may be conveyed through a marked emphasis on the way the response is made – emotions can evidence engagement in the conversation (this overlaps with the other coding category of '*expressions of emotion*'. They are engaged enough in the conversation to care about what is being said and prepared to correct misinformation. Furthermore, a child's statement or a response, in spite of previous (associated) discouragement from the dietitian or parent, is another example verbal autonomy.

Example – *[Parent]*: "See, you don't even know what you have in your lunchbox today" *[Child]*: "Grapes…orange…"
[Child following a pause after a parent had given information]: "No, I didn't!"
[Dietitian]: "Do you mean a honeydew melon?" *[Child]*: "No!"

Exclusions – Responses to closed questions, that could conceivably require 'yes'/'no' answer.

Example – *[Dietitian]*: "Do you like oranges?" *[Child]*: "No, I don't."
[Dietitian]: "Do you mean a honeydew melon?" *[Child]*: "No."
[Dietitian]: "Do you do any activities after school?" *[Child]*: "Not really, no."

2.6 Starting to talk when the parent or dietitian is already talking:

Look for – A child starting to speak, when another person is already speaking, is coded as an interruption, and usually indicates that the child believes they have something more important to say than the person who is currently. The child is trying to make him or herself heard. This may be as a result of their personality, age, or in response to a lack of opportunity to take part in the conversation.

If an adult is speaking, and the child also tries to speak, this should be coded. If they are trying to speak and they are not being listened to, leading to them waiting a few seconds before trying again, recording should start at the beginning of their second attempt to make themselves heard. If they are successful, and the other adults start to listen partway through their turn, recording should begin at the start of their turn, even if they have had to repeat themselves briefly so that others can understand them.

The child completing another person's turn or contribution is another form of autonomous engagement, provided their contribution is not anticipated.

Example – *[Child while at least one other person is talking]*: "I don't want…I don't want… *[other people/person stops talking]* I don't want to have breakfast in the morning."
[Parent]: "Because if you have the chocolate, and you don't do the walking, it's just going to…" *[Child]*: "…build up." *[Parent]*: "They have a 20 minute break when they have a snack to…" *[Child]*: "Keep going."

Exclusions – Interruptions that are never 'heard'. If the child lose the battle to make themself heard and stop partway through their attempt, or do not try again if the other adults have clearly not heard them (these include 'unheard' first attempts). If a child answers a question just before the person asking it has finished, this would also not be coded. Similarly, by interjecting another person's speech with 'yeah' or 'uhmmm' or similar non-lexical utterances, the child is encouraging that person in their contribution, rather than intending to interrupt their turn.

Example – *[Child while at least one other person is talking]*: "I don't want…I don't want… I don't want to have breakfast in the morning." *[Other people/person stops talking and the child tries to say the same thing again]*

Exclusions – If the parent or dietitian pauses and waits for the child to complete their turn or contribution, this is a form of answering a question, and should therefore not be coded on that basis. This is usually identified by the tone of the adult's voice and length of the pause.

2.7 Accepting an alternative opinion or view point:

Look for – If a child has made a statement and they been proved wrong, or realise that their parent (or the dietitian) is correct and they are not. This may be an implied verbal admission of error, e.g. "oooh" or "oops", and includes changing their mind about something, either spontaneously or as a result of information that has been given to them. Admissions of fault may occur during the child's turn (in which case the whole turn is coded) or as a separate turn or statement.

Example – *[Child (not coded)]*: "I don't do much walking:" *[Parent]*: "You do lots of walking. We walk everywhere." *[Child (coded)]*: "Oh, yeah. We do."
[Child (not coded)]: "Half-seven." *[Parent]*: "Half-seven…" *[Child (coded)]*: "Or quarter-to-eight."

2.8 Attempts to clarify their position:

Look for – The child's attempt to clarify their position on a matter. This usually involves providing more detailed information than has been asked for (particularly following closed or leading questions).

Example – *[Dietitian]*: "So you don't like the tomatoes?" *[Child]*: "Cherry tomatoes."
[Dietitian]: "So, with the juices, you don't have a problem with that?" *[Child]*: "Not any more, no."

Exclusions – A situation in which the adult asks the child to repeat to clarify an interruption that wasn't heard clearly, or explain something further.

Example – *[Dietitian]*: "Sorry?" *[Child]*: "It says it's perfect for lunchboxes."

2.9 Making suggestions or recommendations:

Look for – These are typically goal-related. This is coded when the child makes his or her own suggestions or recommendations. In making suggestions or recommendations, the child demonstrates their initiative in finding a solution to a problem. These may be asked for or spontaneously given. He or she may also come up with their own decision about something, or an independent observation.

Example – *[Dietitian]*: "And what happens if it is raining?" *[Child]*: "I could put my waterproofs on."
[Dietitian referring to an interaction shown on the e-resource]: "What do you think about that?" *[Child]*: I am going to cut down on the amount of sugary things I eat."
[Child unprompted, when using the e-resource]: "[I'll] try walking."
[Child unprompted, when using the e-resource, and following interaction with one of the animations]: "six minutes."

Exclusions – Directly prompted guesses at how long it would take to use up the calories contained in food.

Example – *[Dietitian]*: " How long would it take to use that up?"
[Child]: "About 10 minutes?"

3. Code summary:

1. Child – seeking information
2. Child – giving information
   2.1 Expressions of preferences, interests, and spontaneous contributions
   2.2 Descriptions of how the child is feeling
   2.3 Expressions of emotion
   2.4 Self-aware and self-affirming statements
   2.5 Disagreeing and challenging
   2.6 Starting to talk when the parent or dietitian is already talking
   2.7 Accepting an alternative opinion or view point
   2.8 Attempts to clarify their position
   2.9 Making suggestions or recommendations

Appendix 25a. Parent pre-intervention questionnaire (Chapter Five)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Title of Study: **The feasibility of using Feed-back (an e-resource) on a tablet (like an iPad) to help communication within a child weight management consultation – *Phase 1 and Phase 2***

Participant number: _____

Parent pre-intervention questionnaire

Please answer the following questions.

1. Your relationship to the child: Please tick **one** box.

☐ Mother

☐ Father

☐ Other (please specify): _____

2. How would you describe yourself? Please tick **one** box.

☐ White British	☐ Indian	☐ Black African
☐ White Irish	☐ Pakistani	☐ Black other
☐ White other	☐ Bangladeshi	☐ Chinese
☐ White & Black Caribbean	☐ Black	☐ Other (please specify below):
☐ White & Asian	☐ Black British	_____
☐ White & Black African	☐ Black Caribbean	_____

3. The highest level of education you have achieved: Please tick **one** box.

☐ No educational qualifications
☐ O levels/GCSEs/Foundation diploma or certificate / NVQ level 1 or 2
☐ 'A' levels/National diploma or certificate / NVQ level 3
☐ Professional diploma or certificate / NVQ level 4
☐ Foundation degree / Higher National Diploma
☐ Undergraduate degree or equivalent
☐ Postgraduate degree or equivalent
☐ Other (please specify below):

_____

Please continue to page 2...

Parent pre-intervention questionnaire continued...

4. How would you describe your child's communication during a typical Healthy Kid5 appointment? Please tick **one** box.

☐ Less talkative than usual

☐ About as talkative as usual

☐ More talkative than usual

5. How much do you think your child understands about what is said to them in a typical Healthy Kid5 appointment? Please tick **one** box.

☐ Very little

☐ A little

☐ A lot

☐ Everything

6. How easy do you find talking to your child about the changes (talked about in the appointment) when you at home? Please tick **one** box.

☐ Very difficult

☐ Difficult

☐ Easy

☐ Very easy

Please explain why you find it either 'difficult' or 'easy'?

_____

_____

_____

_____

7. What are your thoughts on what your child currently eats and drinks?

_____

_____

_____

Please continue to page 3...

Parent pre-intervention questionnaire continued…

8. What is your view on the amount of time your child spends being physically active compared with screentime (time spent on leisure activities, such as X-box, TV, YouTube, DVDs, tablet devices)?

_____

_____

_____

9. What are the barriers to helping your child to make healthy changes?

_____

_____

_____

_____

_____

Thank you for your time.

Appendix 25b. Parent post-intervention questionnaire (Chapter Five)

Questions 1-7 became the parent E-SAM (Appendix 21b)

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Staffordshire and Stoke on Trent Partnership NHS Trust

Parent post-intervention questionnaire continued…

Please answer the following questions.

*8. How would you describe your child's communication during **this** Healthy Kid5 appointment?* Please tick **one** box.

☐	☐	☐
Less talkative than usual appointments	About as talkative as usual appointments	More talkative than usual appointments

9. Have the app screens that your child has seen today given you any ideas about how to talk to, or support, your child to make healthy changes?

_____

_____

_____

_____

10. Is there anything that you and your child have seen today that you may refer back to? Can you give any specific examples of what you would use from the app?

_____

_____

_____

_____

11. In this appointment, have you learnt about any healthy changes (dietary or physical activity) that you or your child could make?

_____

_____

_____

_____

Thank you for your time.

Appendix 26a. Parent information letter – patient usability testing (Chapter Four)

The University of Nottingham
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Staffordshire and Stoke on Trent Partnership NHS Trust

Participant information sheet for parents (Phase 1)
(Final version 2.0: 18.12.14)

Title of Study: **The feasibility of using *Feed-back* (an e-resource) on a tablet (like an iPad) to help communication within a child weight management consultation**

Researcher:	Carol Raaff (Specialist Paediatric Dietitian – Healthy Kid5 Service – and PhD Researcher)
Research Supervisors:	Prof Cris Glazebrook Prof Heather Wharrad

We would like to invite your child to take part in our research study. Before you decide, we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

Electronic visual aids (designed for tablet devices, like iPads) have not yet been introduced into child weight management appointments, mainly because nothing suitable had been developed. However, young children seem to respond to electronic images and interactive games and it seems logical to explore the potential usefulness of such resources in dietetic child weight management appointments, to eventually find out whether it improves treatment. We have developed an app (for a tablet device) for this reason.

The app (designed for a tablet, like an iPad) is called *Feed-back*. It is evidence-based and has been peer-reviewed (by other paediatric dietitians from across the UK). This study is designed to find out whether it is suited to use in a clinic setting – we need to find out what children and their parents think of the app. After we have gathered feedback from families, the another piece of research will try to measure the effect of the *Feed-back* app on communication with children (and their parents / carers).

Why has my child been invited?

The *Feed-back* app has been developed to treat overweight 7 to 11 year olds and so we are inviting children of this age group who have been referred to the Healthy Kid5 Service. We are hoping to have five children (and a parent / carer) who will to take part in the study.

Does my child have to take part?

It is up to you and your child to decide whether or not to take part. If your child does take part, you will be given this information sheet to keep and be asked to sign a consent form. If you and your child decide to take part, you (and your child) are still free to withdraw at any time, without giving a reason. This would *not* affect your legal rights or the care that you will receive from the Healthy Kid5 Service.

What will happen to my child and I if we take part?

In brief, taking part in the study will mean that you and your child will be asked to:

- Attend one Healthy Kid5 appointment (that you would have attended anyway),
- Use the *Feed-back* app at this appointment, and
- Complete two short questionnaires each. This will mean that you will need to allow an extra 25 minutes for the appointment.

In detail, this is what will happen*:*

- We will arrange your child's follow-up appointment with the Healthy Kid5 Service, for you and your child to attend, as usual. Normally, we ask parents to allow 30 minutes for this appointment. Taking part in this study will mean arriving 15 minutes before the appointment, so that you and your child can ask questions about the study, sign a study consent form, and answer a short questionnaire each. The dietitian will read your child the questions and also write down his/her answers. You will be asked to answer your questions on paper and not to help your child to answer theirs. The questionnaire should take about five minutes to complete.
- Your child will use the *Feed-back* app during their appointment (and receive similar treatment and advice had they not taken part in the study).
- After the appointment, you will both be asked to complete another short questionnaire each (similar to what you both did before the appointment, which should take about five minutes), to be handed to the dietitian before you leave.
- Your child's involvement in the study will end at this point. You will *not* be asked to complete any further study-related questionnaires. Families attending the appointment and completing both sets of questionnaires (mentioned above) will receive a £20 Amazon gift voucher. Once the data has been analysed, the study findings will be summarised and posted to you.

Expenses and payments

Participants will not be paid to take part in the study, but families will be posted a £20 Amazon gift voucher after the 'study' appointment.

What are the possible disadvantages and risks of taking part?

One disadvantage to taking part in the study is that the 'study' appointment that your child has with the Healthy Kid5 Service will take up to 20 minutes longer than usual. You and your child will spend this time giving written consent and completing two short study questionnaires each.

What are the possible benefits of taking part?

We cannot promise the study will help you and your child but the information we get from this study may help to improve outcomes for child weight management in the future, and your child may enjoy using the *Feed-back* app.

What happens when the research study stops?

When the study stops, your child will continue to be offered treatment and support from the Healthy Kid5 Service for up to 12 months from the first appointment.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher who will do their best to answer your questions. The researcher's contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do this by contacting the *Patient Advice and Liaison Service* (PALS):

Edric House
Wolseley Court
Towers Plaza
Wheelhouse Road
Rugeley WS15 1UW
01889 571523
PALS@ssotp.nhs.uk

Will my child's taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you and your child will be handled in confidence.

If your child joins the study, data collected for the study will be looked at by authorised persons from the University of Nottingham who are organising the research (examples of this data are your child's date of birth, gender, BMI (on referral and their most recent measurement), and appointment attendance). They may also be looked at by those authorised to check that the study is being carried out correctly. All will have a duty of confidentiality to you and your child, as a research participant, and we will do our best to meet this duty.

All information that is collected about you or your child during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, and in password-protected folders. Any information about you or your child, which leaves NHS premises, will have your names and address removed (anonymised), and a unique code used, so that you and your child could not be recognised from it.

Your child's personal data (address, telephone number) will be kept for 12 months after the end of the study so that we are able to contact you about the findings of the study (unless you advise us that you do not wish to be contacted). All other study data will be kept securely for seven years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your confidentiality, only members of the research team will have access to your personal data.

In line with Staffordshire and Stoke-on-Trent Partnership NHS Trust Safeguarding Guidelines, although the information you and your child provide in the appointments or in the questionnaires is confidential, should you disclose anything to us which we feel puts you, your child or anyone else at any risk, we may feel it necessary to report this to the appropriate persons.

What will happen if I don't want my child to carry on with the study?

Your child's participation is voluntary. You and your child are free to withdraw at any time, without giving any reason, and without it affecting you or your child's legal rights. If your child withdraws then the information collected up until that point cannot be erased and this information may still be used in the study analysis.

What will happen to the results of the research study?

Once all the data has been collected and analysed, a summary of the study findings will be posted to you, within 12 months of the end of the study. Detailed study results will be published in an academic journal and as part of a PhD thesis. You and your child will *not* be identified in any report, presentation or publication.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and is being funded by the researcher as part of her PhD.

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your child's interests. This study has been reviewed and given favourable opinion by East Midlands – Nottingham 2 Research Ethics Committee.

Further information and contact details

If you have any questions, or would like further information, please feel free to contact:

The Researcher:
Mrs Carol Raaff
Specialist Paediatric Dietitian – Child Weight Management
Healthy Kid5 Service
Springfields Health and Wellbeing Centre
Off Lovett Court
Rugeley WS15 2QD
01889 571801/3

And/or the Chief Investigator:
Prof Cris Glazebrook
Head of Divsion of Psychiatry and Applied Psychology
School of Medicine
Room B12, B Floor
Institute of Mental Health
Triumph Road
Nottingham NG7 2HA
0115 82304

Appendix 26b. Parent information letter – feasibility study (Chapter Five)

The University of Nottingham
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Staffordshire and Stoke on Trent Partnership NHS Trust

Participant information sheet for parents (Phase 2)
(Final version 1.0: 24.11.14)

Title of Study: **The feasibility of using *Feed-back* (an e-resource) on a tablet (like an iPad) to help communication within a child weight management consultation**

Researcher:	Carol Raaff (Specialist Paediatric Dietitian – Healthy Kid5 Service – and PhD Researcher)
Research Supervisors:	Prof Cris Glazebrook Prof Heather Wharrad

We would like to invite your child to take part in our research study. Before you decide, we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. Talk to others about the study if you wish. Ask us if there is anything that is not clear.

What is the purpose of the study?

Electronic visual aids (designed for computers and tablet devices) have not yet been introduced into child weight management appointments, mainly because nothing suitable had been developed. However, young children seem to respond to electronic images and interactive games and it seems logical to explore the potential usefulness of such resources in dietetic child weight management appointments, to eventually find out whether it improves treatment. We have developed an app (for a tablet device) for this reason.

The app, called *Feed-back*, is evidence-based, it has been peer-reviewed (by other paediatric dietitians from across the UK), and tested in a clinic setting with overweight children and their parents. The next step is to see if it has any positive effects on communication with children (and parents / carers). This study will be relatively small and is called a feasibility study because if the results are promising (and the *Feed-back* app shows some benefit), we will undertake a larger study to look at its effect on treatment outcomes (such as the child's weight and BMI or body mass index).

Why has my child been invited?

The *Feed-back* app has been developed to treat overweight 7 to 11 year olds and so we are inviting children of this age group who have been referred to the Healthy Kid5 Service. We are hoping to have 15 children (and a parent / carer) who will to take part in the study.

Does my child have to take part?

It is up to you and your child to decide whether or not to take part. If your child does take part, you will be given this information sheet to keep and be asked to sign a consent form. If you and your child decide to take part, you (and your child) are still free to withdraw at any time, without giving a reason. This would *not* affect your legal rights or the care that you will receive from the Healthy Kid5 Service.

What will happen to my child and I if we take part?

In brief, taking part in the study will mean that you and your child will be asked:

- Attend one Healthy Kid5 appointment (that you would have attended anyway),
- Use the *Feed-back* app at this appointment, and
- Complete two short questionnaires each. This will mean that you will need to allow an extra 25 minutes for the appointment.

The appointment will be audio-recorded.

In detail, this is what will happen*:*

- We will arrange your child's follow-up appointment with the Healthy Kid5 Service, for you and your child to attend, as usual. Normally, we ask parents to allow 30 minutes for this appointment. Taking part in this study will mean arriving 15 minutes before the appointment, so that you and your child can ask questions about the study, sign a study consent form, and answer a short questionnaire each. The dietitian will read your child the questions and also write down his/her answers. You will be asked to answer your questions on paper and not to help your child to answer theirs. The questionnaire should take about five minutes to complete.
- Your child will use the *Feed-back* app during their appointment (and receive similar treatment and advice had they not taken part in the study). The appointment will be audio-recorded.
- After the appointment, you will both be asked to complete another short questionnaire each (similar to what you both did before the appointment, which should take between 5 and 10 minutes), to be handed to the dietitian before you leave.
- Your child's involvement in the study will end at this point. Future appointments with the Healthy Kid5 Service will *not* be audio-recorded and you will *not* be asked to complete any further study-related questionnaires. Families attending the appointment and completing both sets of questionnaires (mentioned above) will receive a £20 Amazon gift voucher. Once the data has been analysed, the study findings will be summarised and posted to you.

Expenses and payments

Participants will not be paid to take part in the study, but families will be posted a £20 Amazon gift voucher after the 'study' appointment.

What are the possible disadvantages and risks of taking part?

One disadvantage to taking part in the study is that the 'study' appointment that your child has with the Healthy Kid5 Service will take up to 25 minutes longer than usual. You and your child will spend this time giving written consent and completing two short study questionnaires each.

What are the possible benefits of taking part?

We cannot promise the study will help you and your child but the information we get from this study may help to improve outcomes for child weight management in the future, and your child may enjoy using the *Feed-back* app.

What happens when the research study stops?

When the study stops, your child will continue to be offered treatment and support from the Healthy Kid5 Service for up to 12 months from their first appointment.

What if there is a problem?

If you have a concern about any aspect of this study, you should ask to speak to the researcher who will do their best to answer your questions. The researcher's contact details are given at the end of this information sheet. If you remain unhappy and wish to complain formally, you can do this by contacting the *Patient Advice and Liaison Service* (PALS):

Edric House
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Towers Plaza
Wheelhouse Road
Rugeley WS15 1UW
01889 571523
PALS@ssotp.nhs.uk

Will my child's taking part in the study be kept confidential?

We will follow ethical and legal practice and all information about you and your child will be handled in confidence.

If your child joins the study, data collected for the study will be looked at by authorised persons from the University of Nottingham who are organising the research (examples of this data are your child's date of birth, gender, BMI (on referral and their most recent measurement), and appointment attendance). They may also be looked at by those authorised to check that the study is being carried out correctly. All will have a duty of confidentiality to you and your child, as a research participant, and we will do our best to meet this duty.

All information that is collected about you or your child during the course of the research will be kept **strictly confidential**, stored in a secure and locked office, and in password-protected folders. Any information about you or your child, which leaves NHS premises, will have your names and address removed (anonymised), and a unique code used, so that you and your child could not be recognised from it.

Your child's personal data (address, telephone number) will be kept for 12 months after the end of the study so that we are able to contact you about the findings of the study (unless you advise us that you do not wish to be contacted). All other study data will be kept securely for seven years. After this time your data will be disposed of securely. During this time all precautions will be taken by all those involved to maintain your

confidentiality, only members of the research team will have access to your personal data.

In line with Staffordshire and Stoke-on-Trent Partnership NHS Trust Safeguarding Guidelines, although the information you and your child provide in the appointments or in the questionnaires is confidential, should you disclose anything to us which we feel puts you, your child or anyone else at any risk, we may feel it necessary to report this to the appropriate persons.

What will happen if I don't want my child to carry on with the study?

Your child's participation is voluntary. You and your child are free to withdraw at any time, without giving any reason, and without it affecting you or your child's legal rights. If your child withdraws then the information collected up until that point cannot be erased and this information may still be used in the study analysis.

What will happen to the results of the research study?

Once all the data has been collected and analysed, a summary of the study findings will be posted to you, within 12 months of the end of the study. Detailed study results will be published in an academic journal and as part of a PhD thesis. You and your child will *not* be identified in any report, presentation or publication.

Who is organising and funding the research?

This research is being organised by the University of Nottingham and is being funded by the researcher as part of her PhD.

Who has reviewed the study?

All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to protect your child's interests. This study has been reviewed and given favourable opinion by East Midlands – Nottingham 2 Research Ethics Committee.

Further information and contact details

If you have any questions, or would like further information, please feel free to contact:

The Researcher:
Mrs Carol Raaff
Specialist Paediatric Dietitian – Child Weight Management
Healthy Kid5 Service
Springfields Health and Wellbeing Centre
Off Lovett Court
Rugeley WS15 2QD
01889 571801/3

And/or the Chief Investigator:
Prof Cris Glazebrook
Head of Divsion of Psychiatry and Applied Psychology
School of Medicine
Room B12, B Floor
Institute of Mental Health
Triumph Road
Nottingham NG7 2HA
0115 82304

Appendix 27a. Child information letter – patient usability testing (Chapter Four)

The University of Nottingham
UNITED KINGDOM · CHINA · MALAYSIA

Staffordshire and Stoke on Trent Partnership NHS Trust

Participant information sheet for the child (Phase 1)
(Final version 1.0: 24.11.14)

Title of Study: **Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments**

We would like to you to take part in our study.

What is a study?

A study is a careful experiment to find out the answer to an important question.

Before you decide, we would like you to understand what the study is about and what you would need to do. Someone will talk to you about the study and you will have a chance to ask questions before you decide.

Why are we doing the study and why have I been invited?

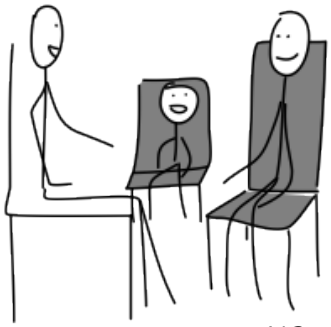
Most children like looking at apps and looking at moving pictures on mobile phones and tablets (like iPads). We want to see whether our new tablet app (called *Feed-back*), could make Healthy Kid5 appointments better for children and their parents. The *Feed-back* app is for 7 to 11 year olds working towards getting to a healthy weight. We are looking for five children to take part – we would like you to think about being one of those children.

Do I have to take part?

It is up to you and your mum or dad to decide whether or not to take part. Even if you decide to take part, you are allowed to change your mind without giving a reason. If you decide not to take part in this study, it will not affect your care from the Healthy Kid5 Service.

What will happen to me if I take part?

You, and your mum or dad, will come to one Healthy Kid5 appointment (as usual).



During the appointment, there will be two differences:

- You will use the *Feed-back* app as part of your appointment, and
- You (and your mum or dad) will fill in two short forms each. You will be able to tell someone what your answers are (so, not have to write your answers down)

After the study, you will have your usual appointments with the Healthy Kid5 Service.

What are the good and bad points of taking part?

One bad point is that the forms will take some extra time to fill in. A good point is that families taking part will receive a £20 Amazon gift voucher, and you may also enjoy using the *Feed-back* app!

Will my taking part in the study be kept private?

All the information collected about you and your family in this study will be kept private. The information will be looked after and only seen by people doing the study, or who need to make sure that study is being done properly.

Please talk to your mum or dad and ask if anything that is not clear.

Appendix 27b. Child information letter – feasibility study (Chapter Five)

The University of Nottingham
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Staffordshire and Stoke on Trent Partnership NHS Trust

Participant information sheet for the child (Phase 2)
(Final version 1.0: 24.11.14)

Title of Study: **Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments**

We would like to you to take part in our study.

What is a study?

A study is a careful experiment to find out the answer to an important question.

Before you decide, we would like you to understand what the study is about and what you would need to do. Someone will talk to you about the study and you will have a chance to ask questions before you decide.

Why are we doing the study and why have I been invited?

Most children like looking at apps and looking at moving pictures on mobile phones and tablets (like iPads). We want to see whether our new tablet app (called *Feed-back*), could make Healthy Kid5 appointments better for children and their parents. The *Feed-back* app is for 7 to 11 year olds working towards getting to a healthy weight. We are looking for 15 children to take part – we would like you to think about being one of those children.

Do I have to take part?

It is up to you and your mum or dad to decide whether or not to take part. Even if you decide to take part, you are allowed to change your mind without giving a reason. If you decide not to take part in this study, it will not affect your care from the Healthy Kid5 Service.

What will happen to me if I take part?

You, and your mum or dad, will come to one Healthy Kid5 appointment (as usual).

During the appointment, there will be three differences:

- You will use the *Feed-back* app as part of your appointment,
- What we say in the appointment will be recorded (*not* videoed), and
- You (and your mum or dad) will fill in two short forms each. You will be able to tell someone what your answers are (so, not have to write your answers down)

After the study, you will have your usual appointments with the Healthy Kid5 Service.

What are the good and bad points of taking part?

One bad point is that the forms will take some extra time to fill in. A good point is that families taking part will receive a £20 Amazon gift voucher, and you may also enjoy using the *Feed-back* app!

Will my taking part in the study be kept private?

All the information collected about you and your family in this study will be kept private. The information will be looked after and only seen by people doing the study, or who need to make sure that study is being done properly.

Please talk to your mum or dad and ask if anything that is not clear

Appendix 28a. Parent consent and child assent form – patient usability testing (Chapter Four)

The University of Nottingham
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Staffordshire and Stoke on Trent Partnership NHS Trust

CONSENT FORM FOR PARENTS AND CHILDREN
(Final version 3.0: 18.12.14)

FOR THE PARENT:

Title of Study: The feasibility of using Feed-back (an e-resource) on a tablet (like an iPad) to help communication within a child weight management consultation – *Phase 1*

REC ref: 14/EM/1310

Name of Researcher:

Name of Participant (Parent):

Name of Participant (Child):

Please initial box

1. I confirm that I have read and understand the information sheet version number 2.0 dated 18.12.14 for the above study and have had the opportunity to ask questions. ☐
2. I understand that my child's participation is voluntary and that they are free to withdraw at any time, without giving any reason, and without their medical care or legal rights being affected. I understand that should they withdraw then the information collected so far cannot be erased and that this information may still be used in the project analysis. ☐
3. I understand that relevant sections of my child's medical notes and data collected in the study may be looked at by authorised individuals from the University of Nottingham, the research group and regulatory authorities where it is relevant to our taking part in this study. I give permission for these individuals to have access to these records and to collect, store, analyse and publish information obtained from my child's participation in this study. I understand that my child's personal details will be kept confidential. ☐
4. I agree for my child (named above) to take part in the above study. ☐

_____	_____	_____
Name of Parent	Date	Signature
_____	_____	_____
Name of Researcher (taking consent)	Date	Signature

3 copies: 1 for participant, 1 for the project notes and 1 for the medical notes if applicable

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FOR THE CHILD:

Title of Study: Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 1*

Please answer the questions below by ticking either the 'yes' or the 'no':

	Yes	No
Has somebody else explained this project to you?	☐	☐
Do you understand what this project is about?	☐	☐
Have you asked all the questions you want?	☐	☐
Have you had your questions answered in a way you understand?	☐	☐
Do you understand that it is OK to stop taking part at any time?	☐	☐
Are you happy to take part?	☐	☐

If any of your answers are 'no' or you don't want to take part, don't sign your name!

If you do want to take part, please write your name below.

Your name: _____

Date: __ / __ / _____

The dietitian who explained this project to you needs to sign too:

Print Name: _____

Sign: _____

Date: __ / __ / _____

3 copies: 1 for participant, 1 for the project notes and 1 for the medical notes if applicable

Appendix 28b. Parent consent and child assent form – feasibility study (Chapter Five)

The University of Nottingham
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Staffordshire and Stoke on Trent Partnership NHS Trust

FOR THE CHILD:

Title of Study: Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 2*

Please answer the questions below by ticking either the 'yes' or the 'no':

	Yes	No
Has somebody else explained this project to you?	☐	☐
Do you understand what this project is about?	☐	☐
Have you asked all the questions you want?	☐	☐
Have you had your questions answered in a way you understand?	☐	☐
Do you understand that it is OK to stop taking part at any time?	☐	☐
Are you happy to take part?	☐	☐

If any of your answers are 'no' or you don't want to take part, don't sign your name!

If you do want to take part, please write your name below.

Your name: _____

Date: __ / __ / _____

The dietitian who explained this project to you needs to sign too:

Print Name: _____

Sign: _____

Date: __ / __ / _____

3 copies: 1 for participant, 1 for the project notes and 1 for the medical notes if applicable

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FOR THE CHILD:

Title of Study: Using the *Feed-back* app on a tablet (like an iPad) in Healthy Kid5 appointments – *Phase 2*

Please answer the questions below by ticking either the 'yes' or the 'no':

	Yes	No
Has somebody else explained this project to you?	☐	☐
Do you understand what this project is about?	☐	☐
Have you asked all the questions you want?	☐	☐
Have you had your questions answered in a way you understand?	☐	☐
Do you understand that it is OK to stop taking part at any time?	☐	☐
Are you happy to take part?	☐	☐

If any of your answers are 'no' or you don't want to take part, don't sign your name!

If you do want to take part, please write your name below.

Your name: _____

Date: __ / __ / _____

The dietitian who explained this project to you needs to sign too:

Print Name: _____

Sign: _____

Date: __ / __ / _____

3 copies: 1 for participant, 1 for the project notes and 1 for the medical notes if applicable