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
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**Using design to improve the healthcare experiences
for children and young persons in primary care
practices**

by

Jennifer Louise Day

MPhil Thesis

Submitted in partial fulfilment of the requirements for the award
of Master of Philosophy of Loughborough University

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Abstract

Context of research: This thesis aims to develop design recommendations for primary care environments and medical equipment to improve the experience for children and young persons. Children and young persons may be particularly vulnerable to additional stress when trying to make sense of their medical care experiences due to the varying cognitive developmental level. The design of healthcare facilities has focused on functional effectiveness but has tended to ignore the psychological needs of the patients. Clinical environments and medical equipment have been found to impose an added stress for patients who are already suffering with the anxiety of illness.

Methodology: Surveys and interviews were carried out with parents, healthcare professionals and design stakeholders to explore aspects of primary care environments and medical equipment. Parents (n = 228) were asked to rate twelve statements about emotions that their child might feel in waiting rooms, treatment rooms and about medical equipment. Semi-structured interviews (n = 4) were conducted with healthcare professionals with experience treating children and young persons. In-depth interviews (n = 10) were conducted with healthcare and children's design stakeholders including healthcare architects, medical product designers, children's product designers and healthcare practice staff. The topics explored included the processes and resources used in design and the main barriers faced, experiences of designing for children, young persons and people of different ages and the difficulties encountered.

Findings: The parent and healthcare professional data identified that experiences were largely dictated by the provision of entertainment material, use of distraction, general décor of environments, behaviour of healthcare professionals towards both child and parent, and how the parent behaved in front of their child. The results from the design stakeholder interviews showed evidence of increased use of user-centred design techniques being incorporated into new, modern practices to respond to the psychological needs of patients but that also the provision of resources and standards could be a barrier to improved design options. The recommendations will encourage the inclusion of children- and young people-friendly design in current and future healthcare environments, and recommendations for future research.

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Firstly, I would like to thank my Supervisors Dr Diane Gyi and Dr Sue Hignett for their help, guidance and encouragements throughout my studies. Without their time and input I would not have completed this thesis.

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I would like to thank all the participants that took part in my studies for their time and contribution to my research. Without them this would have not been possible.

Finally, I would like to acknowledge Loughborough University Design School for taking me on and giving me this opportunity. In total I have had seven wonderful years at Loughborough and I have gained plenty of great memories that will stay with me for the rest of my life.

Dedication

To my parents, Lynn and Chris, who have always supported and encouraged me throughout all areas of my life. Without their love and support I would not have been able to achieve the academic and sporting accomplishments over the years.

And to my close friends and housemates, Jo and Jason, who have put up with me over the past 2 years, thank you. You deserve a medal!

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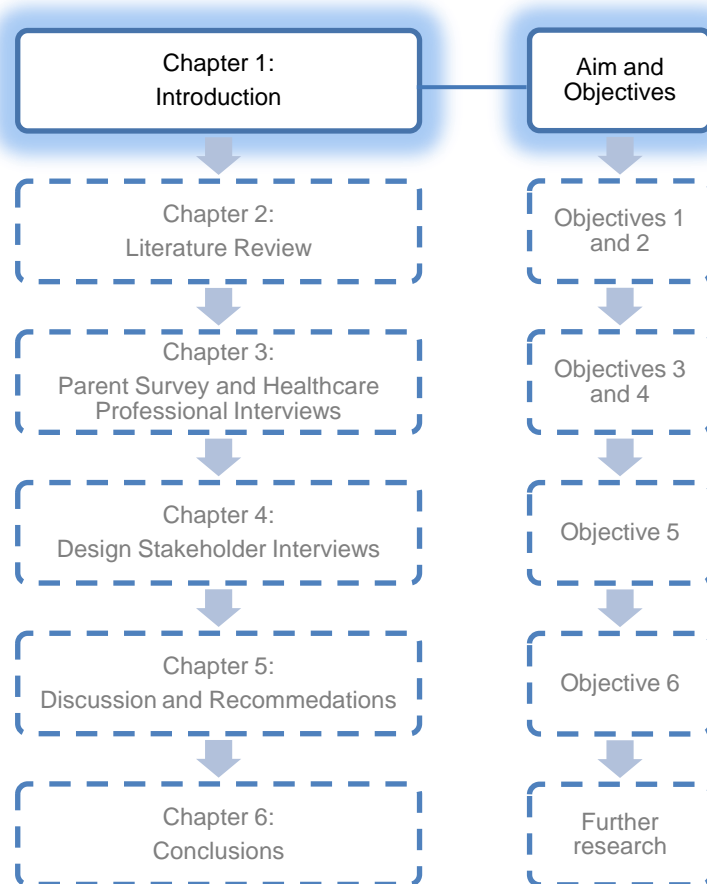
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Chapter 1: Introduction



1.1. Introduction

Healthcare is an extensively researched field encompassing a wide variety of topics, from injection phobias and pain reactivity to medical product design and therapeutic acute care environments. However, there is wide variation in the depth of which topics like these have been investigated, for example, facility design.

Healthcare facility design traditionally emphasises the functional effectiveness of a facility. This type of design can be considered to be 'psychologically hard' (Ulrich, 1991) with respect to patient's psychological needs and well-being. These 'hard' environments are said to fail because they are stressful or otherwise unsuited to the psychological needs of patients; leading to increases in negative consequences, for example anxiety and elevated blood pressure (e.g. Wilson, 1972; Ulrich, 1984). The majority of healthcare facility design literature, however, relates to secondary (acute) care. This has presumably been researched

in more depth due to the heightened seriousness of illness if admitted to a secondary care unit, the cost of a length of the stay in hospital, and the view that psychologically supportive design is important during long stays. There have been studies investigating primary care environment design (e.g. Arneill and Devlin, 2002) but very few compared with secondary care design.

1.2. Children and young persons

Children and young people (up to 18 years) were identified as the user groups due to differences in physical, cognitive and emotional factors in comparison with adults. Children's and young person's motivations, interests, and fears are quite different to those of adults, but there can also be extreme variation between children and young people depending on age and developmental level. A child's or young person's stage of personality development will impact on the ways they attempt to make sense of their medical care experiences. The treatment of acute or chronic illnesses may create significant stress (associated with the fear and anxiety surrounding these painful procedures) for the child and family (Patterson and Ware, 1988).

Young children especially can also be influenced by their parent's behaviour. In a study to investigate the influence of parental modelling on the acquisition of fear and avoidance, it was found that strong observational learning results were consistent with views that modelling constitutes a mechanism by which fear may be acquired early in life (Gerull and Rapee, 2001).

1.3. Context of research

There has been little research about children and young people within healthcare design, especially primary healthcare. Only 3 out of 85 studies on healthcare design were found to be about children (Rubin *et al.*, 1998; Shepley, 2001). In the past decade there have been several investigations in to medical equipment design for children (e.g. Desmet and Dijkhuis, 2003; Reynolds and Lu Liu, 2010) but as with primary care environment design, this research area is still relatively limited.

This research aims to explore how design can improve the experiences of children and young persons in primary healthcare. It was funded by Loughborough University Design School.

1.4. Aim and Objectives

The primary aim of the research of this thesis is to provide recommendations (in the form of concepts and methodologies) for the design of healthcare products and/or environments to

reduce the intensity of negative emotions elicited in children when visiting primary care practices and provide a more pleasurable experience.

The research questions are:

- *What kinds of emotions do children and young persons aged 0-18 years experience at their local primary care practice?*
- *What is currently available for children and young persons aged 0-18 years at primary care practices to promote a positive experience?*
- *What influences a child's or young person's experience at a primary care practice?*
- *How can the design of environments and products help improve healthcare interactions for children and young people?*
- *What feasible design changes can be made in current and new primary care practices?*

The objectives in order to answer these research questions and achieve the aim of this thesis are:

- *Objective 1: To review literature about children and healthcare, design and emotion, and healthcare design.*
- *Objective 2: To identify the most appropriate methodology in order to achieve objectives 3 and 4.*
- *Objective 3: Explore parent and healthcare professional experiences of healthcare products and environments for children and young people under 18 years*
- *Objective 4: Identify areas for feasible design adjustment/improvement in the waiting room environment, treatment room environment, medical equipment and staff behaviour*
- *Objective 5: Establish current design practices using design stakeholders*
- *Objective 6: Provide design recommendations*

The process and outcome of this research (Figure 1.1) is to gain insight in to relevant areas (1, 2 and 3) and identify concepts (4) that would help facilitate the design of environments and medical products in primary care practices to promote more positive healthcare interactions, and in turn provide children and young persons with a more pleasurable, positive experience. A long-term outcome would be to provide children and young persons with a better experiences and understanding of healthcare throughout life (5).

Aim: Using design to improve healthcare interactions of children and young persons in primary care practices.

Primary care practices have been chosen as it was decided:

- Little research had previously been conducted on primary care design in comparison to secondary care
- They are visited more frequently than compared to hospitals
- There may be more scope for design modifications within primary care practices

The industry benefits from this research may be applicable to products and environments, within international healthcare contexts, to help children and their families worldwide have a more positive emotional experience.

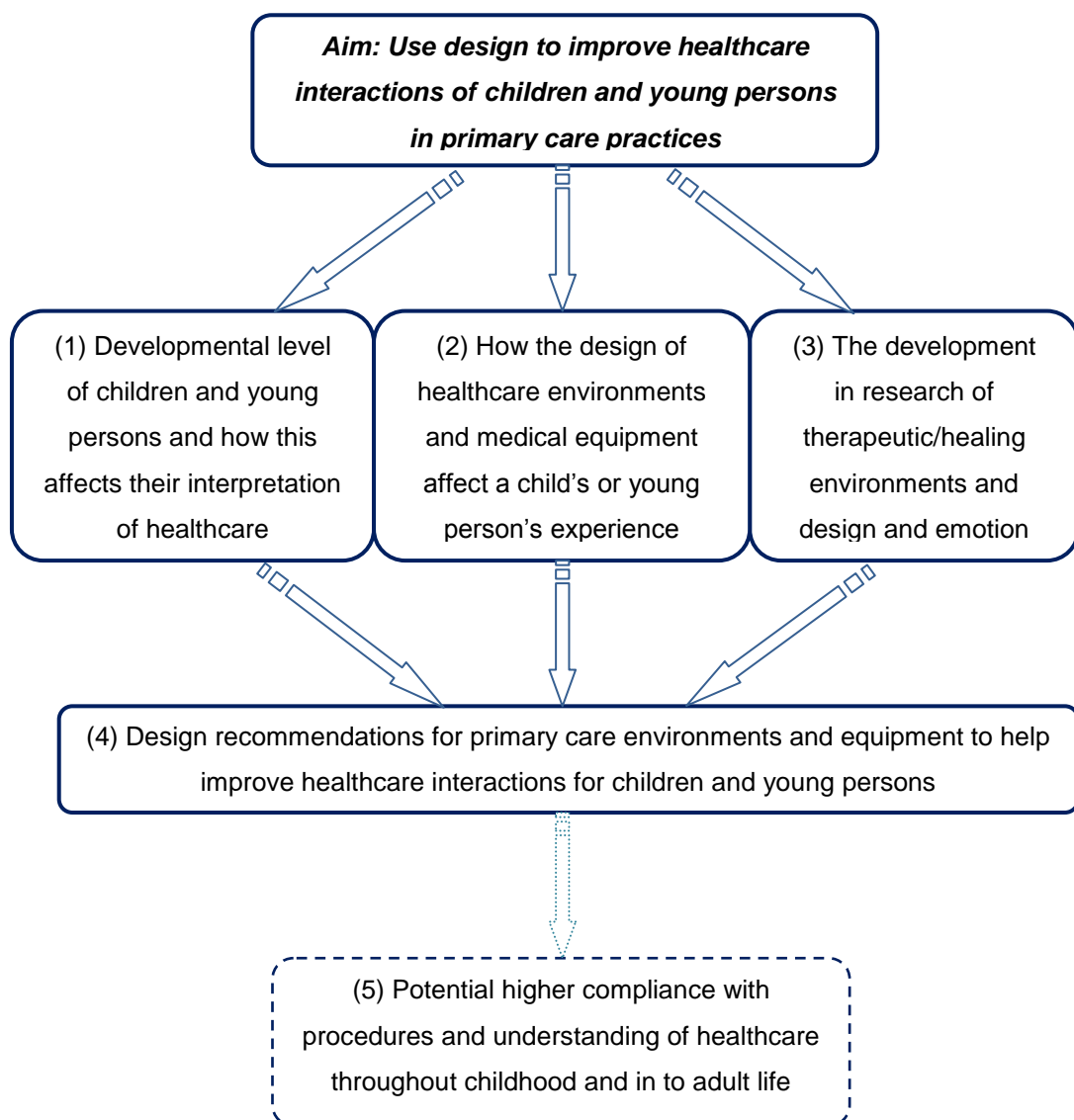


Figure 1.1. Research process

1.5. Structure of thesis

The thesis is structured as shown in Figure 1.2. Chapter 2 is a review of literature conducted to determine the current development and standing of key areas related to the thesis (objective 1). A review of different research methodologies and methods was also conducted (objective 2).

Chapter 3 reports on the first part of data collection, the parent survey of children's emotional experiences at primary care practices with an analysis and discussion of the results. This was in order to gather top level information on children's emotional experiences at local primary care practices. Chapter 3 also reports on the second part of the data collection which was to conduct interviews with healthcare professionals and their experiences with children in primary care practices. This was also to gather information on children's emotional experiences at primary care practices from a perspective other than that of the parent (objectives 3 and 4).

Chapter 4 reports on the third part of data collection which was to use interviews to establish current design practices used by healthcare design stakeholders. The designers interviewed were those with experience with designing for children and young people or experience designing healthcare environments that could help identify options for the design/redesign of healthcare environments and related equipment (objective 5).

Chapter 5 discusses the research findings as a whole together with the literature, and reviews the feasibility of various design improvements and recommendations for primary care practices. The findings from all these studies were then culminated and design recommendations were made (objective 6).

Chapter 6 concludes the thesis with recommendations for further research.

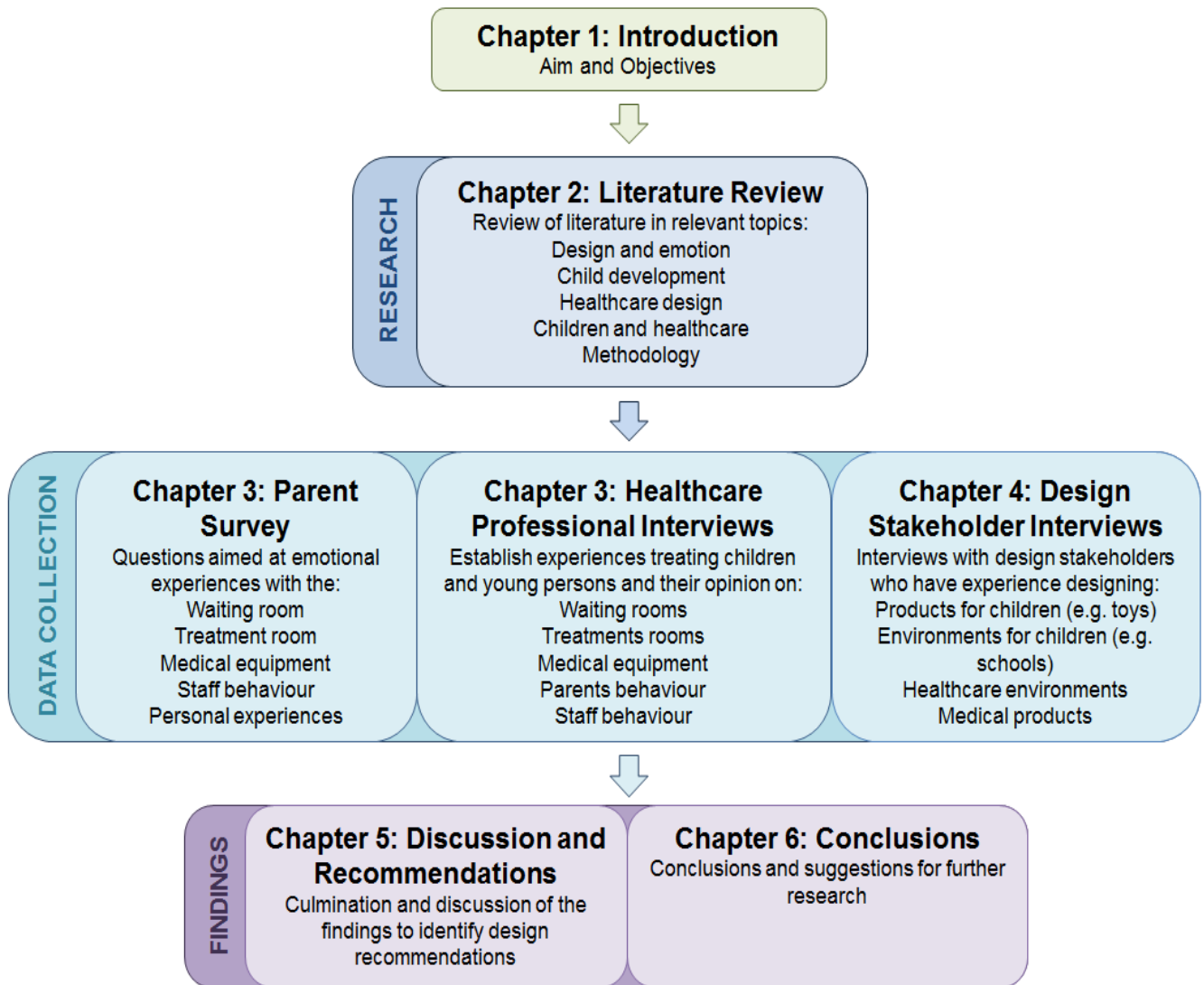
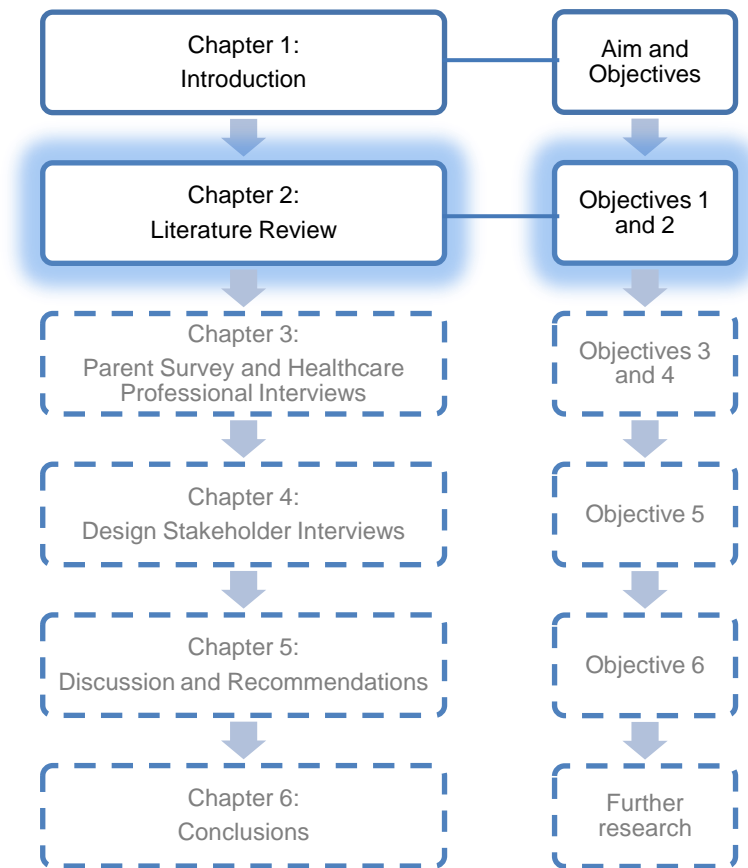


Figure 1.2. Thesis structure

Chapter 2: Literature Review



2.1. Introduction

This chapter reviews the literature relevant to the research aim of this thesis. The review will explore the effects of healthcare design and design in stressful and emotional situations. It also explores the differences between the emotional reactions and coping strategies of children and adults. The research in this chapter was carried out in order to achieve objectives 1 and 2:

- *Objective 1: To review the literature in the areas of children and healthcare, design and emotion and healthcare design.*
- *Objective 2: To identify the most appropriate methodology in order to achieve objectives 3 and 4.*

This chapter is structured as follows:

- 2.2. Identification of literature
- 2.3. Children and healthcare
- 2.4. Healthcare Design
- 2.5. Design and emotion
- 2.6. Summary
- 2.7. Methodology literature

2.2. Identification of literature

A search of electronic databases was conducted using Loughborough University's Library 'Catalogue Plus' database search engine. Catalogue Plus searches Primo Central for details of journal articles and links to full-text articles held by Loughborough, in addition to material available electronically in the subject areas of:

- Designing for children
- Ergonomics
- Environmental design
- Healthcare ergonomics and engineering
- Medical device technology
- Psychology

Keywords were selected (Table 2.1) based on current literature, and reference lists were used to identify possible further studies and relevant research. Abstracts were read and the full text was retrieved only if deemed relevant. No time limits were placed on the searches where the scope on the available literature was unknown. Where there was extensive literature the search was restricted to the most recent literature (post 1970). Searches were conducted of Catalogue Plus databases ANTE, ArticleFirst, ASSIA, BHI, Compendex, Engineered Materials Abstracts, GEOBASE, Greenfile, Health and Safety Science Abstracts, INSPEC, MEDLINE, Polymer Library, PsychARTICLES, PsychINFO, Web of Science, and Zetoc.

The inclusion criteria for the literature included:

- Full-text English language research papers
- Research related to patients or any profession in healthcare services, not just primary care
- No specificity of methodological design (qualitative and quantitative research, experimental and non-experimental)

- Publication in peer-reviewed journals

Table 2.1. Literature search keywords

Category	Keywords	Hits
Design/ Ergonomics	“product design” and/or “children”	30
	“product design and emotion”	74
	“designing for children”	33
	“healthcare” and/or “environment” and/or “ergonomics”	12
	“emotional design”	197
	“interior design” and “emotion”	605
	“healthcare design”	212
Environment	“interior design” and “emotion”	49
	“healthcare design”	196
	“healthcare design” and “emotion”	1
Medicine and Health	“environment”	14
	“product design”	8
	“medical equipment” and “medical device” and “design”	12
	“paediatrics” or “pediatrics”	2
	“hospitalisation” and/or “children”	0
Psychology	“coping methods” and “hospital”	69
	“coping methods” and “children”	112
	“coping methods” and/or “hospital” and/or “children”	1
	“child emotional development”	22
	“emotional development in children”	301
	“worry” and/or “stress” and “children”	10

Out of the total 1958 hits, the titles were assessed for their relevance and excluded if:

- the literature was deemed not relevant to this thesis
- the studies were conducted prior to 1970

Once the literature was narrowed down the abstracts of the remaining literature were reviewed for a further understanding of their relevance to this thesis. There were 117 studies left to be reviewed in more detail (Table 2.2). The final number of papers also includes literature that was found from reference lists of relevant papers.

The literature was then collated and split into three main areas. These were ‘children and healthcare’, ‘healthcare design’ and ‘design and emotion’ (sections 2.3 - 2.5). Of the 117

studies found to meet the criteria, 26 of the most relevant were critically reviewed throughout this chapter and a table summarising these can be seen in Appendix 2.1. The Critical Appraisal Skills Programme (CASP) assessment form was used to assess the studies (Appendix 2.2).

Table 2.2. Literature search yield

Category	Total hits	Met criteria
Design/ Ergonomics	1163	36
Environment	246	13
Medicine and Health	36	28
Psychology	515	40
Total	1958	117

2.3. Children and healthcare

2.3.1. Children and illness

Being hospitalised can be a terrifying experience for a child, and more often than not, the younger the child, the less able they are to understand what is happening and the more frightened they may become as a result of increased negative emotions. For children in toddlerhood and the preschool years – who are rarely inactive when healthy – a hospital stay that involves being immobilised can be very stressful (Sarafino, 2008). Other common stressors and fears in the hospital for toddlers may include having to stay in a strange bed/room, loss of home comforts and possessions, being in contact with unfamiliar people, painful procedures, medical equipment that looks and sounds scary and feeling helpless (New York Presbyterian Morgan Stanley Children’s Hospital, 2008). Young school-age children (approx. 4-11 years) although they are learning to understand what can cause an illness and how the illness affects their bodies, still cannot understand why things that hurt them may be needed to make them better (Women’s and Children’s Health Network Health Service, 2012).

Rocha *et al.* (2003) found that child temperament, previous negative experiences with medical procedures, and maternal responses to their children’s pain were positively associated with pain reactivity of the children. Rocha and Prkachin (2007), along with later studies indicated that this pain experience plays a role in children’s pain reactivity and the development of somatisation (the unconscious process by which psychological distress is expressed as physical symptoms) and poorer health and well-being later in childhood. They found that pain reactivity in kindergarten was associated with children’s self-reports of

somatisation 7 years later leading onto the conclusion that early response styles (i.e., heightened pain reactivity and difficulty adjusting) may indicate risk for increased health care utilisation and poorer health and well-being later in childhood (Rocha and Prkachin, 2007). This study had a small sample size compared to the first study and therefore a larger study would be required to help validate these findings.

These studies help show how experiences of young children may affect behaviour in later childhood and possibly into adulthood. For example, needlephobia mostly affects children but if left unaddressed can last throughout adult life. Öst (1991) found that of 137 needlephobic patients studied, the majority (52%) attributed the onset of their phobia to conditioning experiences, which are likely to have happened when young. This fear of needles can lead to avoidance of appropriate medical care in childhood and adulthood (Öst, 1991). However, there needs to be further investigation in to why some people develop a phobia after a traumatic experience but others do not when they have the same experience.

2.3.1. Developmental Level

Children are not 'little adults' as they differ physically, cognitively and emotionally to adults. With regard to the emotional characteristics, children's motivations, interests, and fears are quite different to those of adults. But there is also extreme variation between children depending on their age and developmental level for cognitive, physical and social/emotional development (Table 2.3). Children's needs are different primarily because their ability to cope and understand are different depending on their development levels (Price, 1994). A child's stage of personality development will impact on the ways in which they attempt to make sense of their medical care experiences. The more sophisticated a child becomes the more realistic their appraisal of what's happening to them when ill or receiving care becomes (DiMatteo, 1991). For example, pre-schoolers do not think very logically and as a result, may have many misconceptions about their health problems and why things happen in the hospital. School-age children's psychosocial development, however, enables them to cope with some aspects better than younger patients (Sarafino, 2008). Caring for a child's psychosocial state is also vital for normal growth and development because if their psychosocial state is compromised, it may affect certain behaviours, e.g. bed wetting, refusing to eat, being withdrawn, etc. (The Royal Children's Hospital Melbourne, 2009).

2.3.2. Children, Worry and Coping

Worry can be a strong response to stress (Brosschot, Gerin and Thayer, 2006); it is a chain of thoughts and images, negatively affect-laden, and relatively uncontrollable. As in adult worry, worry in children is predominantly self-referent, i.e. children usually worry about threats to their own well-being (Borkovec *et al.*, 1983; Hertzog and Farber, 1999).

Table 2.3. Summary of development children 2-14 years (adapted from Lueder and Rice, 2008)

	2-3 years	4-5 years	6-7 years	7-8 years	9-11 years	12-14 years
Cognitive Development	<ul style="list-style-type: none"> • Match primary shapes and colours • Interest in common objects • Enjoy make-believe play • Point to body parts • Match objects to pictures 	<ul style="list-style-type: none"> • Able to categorise • Often believe fantasy & accept magic as an explanation • Develops a concept of time • Focus only on one aspect of a situation 	<ul style="list-style-type: none"> • Longer attention span • Have difficulty imagining other's point-of-view • Cannot consistently understand the consequences of their actions 	<ul style="list-style-type: none"> • Increased problem solving capability • May still have difficulty considering all logical, possible outcome of their actions 	<ul style="list-style-type: none"> • Plans future actions • Solves problems with minimal physical output • May still have difficulty considering all logical, possible outcome of their actions 	<ul style="list-style-type: none"> • Engages in abstract thought • Uses hypothetical reasoning • Speculates about future events
Physical Development	<ul style="list-style-type: none"> • Learn to use toilet • Walk backward, stoop and squat • Explore, dismantle and dismember objects 	<ul style="list-style-type: none"> • Uses a spoon, fork and dinner knife • Left or right hand dominance established • Can copy simple designs and shapes 	<ul style="list-style-type: none"> • Tie shoelaces • Skilled at using scissors and small tools • Ride bicycles without training wheels 	<ul style="list-style-type: none"> • Good sense of balance • Better manipulative skills • Nearly mature brain size 	<ul style="list-style-type: none"> • Improved coordination • Increased bodily strength and hand dexterity • Girls ahead of boys in physical maturity 	<ul style="list-style-type: none"> • Enjoys sports • Better able to judge distances • Endurance improves • Body hair begins to emerge
Social and Emotional Development	<ul style="list-style-type: none"> • Affectionate: hugs and kisses • Seeks approval and attention of adults • Likes to be centre of attention 	<ul style="list-style-type: none"> • Can communicate, share and take turns • More interested in children than adults • Enjoys doing things for themselves • Plays simple games 	<ul style="list-style-type: none"> • Strong desire to perform well and do things right • Enjoys active games • Sensitive and emotionally vulnerable 	<ul style="list-style-type: none"> • See things from other's points of view but still very self-centred • Finds criticism or failure difficult to handle 	<ul style="list-style-type: none"> • Better understands other people's perspectives • Begins to see parents and authority figures as fallible human beings 	<ul style="list-style-type: none"> • Values peer acceptance highly • Becomes daring/adventurous • Interested in real tasks and activities

Furthermore, there is evidence to suggest that the content of children's worries is closely linked to their level of development (Vasey and Daleiden, 1994); they are more susceptible to the stress caused by illness because of their limited grasp of the phenomenon of illness and its causes.

Vasey, Crnic and Carter (1994) examined the content of worries in children ages 5 to 6, 8 to 9, and 11 to 12 years. Through standardised interviews they reported that worries about threats to physical well-being predominated among 5 to 6 year olds and that these worries decreased significantly with increasing age. They argue that from the age of 8 years, worry becomes increasingly complex because as they develop their ability to reason about future possibilities, to consider multiple threatening outcomes, and to elaborate potential negative consequences dramatically increases. They also found that the variety of worries by 8-12 year olds was nearly twice that of 5-6 years olds. This can be explained by the advances in cognitive development around age 8 having the potential to considerably increase the complexity of the worry process. This study, however, had no formal attempt to screen out anxious children and in future there needs to be a measure developed in order to examine the process and content of children's worries.

Salmela *et al.* (2010) found that there was not enough research conducted and data collected about pre-school children that were actually taken from pre-school children themselves, as it had been largely observationally based. They then examined coping strategies of 4-6 year olds ($n = 82$) either in hospital or that could recall hospital experiences. They found that a total of 517 different coping strategies were mentioned by children in hospital and children recalling experiences of hospital. Those that were currently in hospital reported 'play' more often as a coping strategy and the children who were recalling experiences reported the presence of family more often. This study was conducted by interviewing pre-school children (aged 4-6) themselves which differs from other studies that relied on either observation or the interviewing of parents. The study's sample selection technique, however, relied purely on voluntary participation and the use of several different interviewers. These could be viewed as factors contributing to reduced reliability of the results and so further studies of a similar methodology would need to be done to validate these findings.

2.3.3. Parental Influences and Somatisation

It has been suggested that parents' behaviours may represent attempts to influence their children (Kopp, 1982). Behaviours such as reassurance, empathy, criticising, and bargaining with a child have been related to increased child distress, whereas distraction and

nonprocedural talk have been related to decreased levels of distress (Blount *et al.*, 1989; Gonzalez, Routh and Armstrong, 1993; Dahlquist, Power and Carlson, 1995; Frank *et al.*, 1995; Sweet and McGrath, 1998; Cohen, Manimala and Blount, 2000).

Rocha *et al.* (2003) evaluated predictors of somatisation* and pain reactivity in children. They used facial expressions as a measure of pain reactivity as experimental and clinical studies identified a limited set of facial actions that correlate with pain, vary in intensity, and can be readily observed in a natural environment. They found maternal responses were a strong predictor of somatisation and pain reactivity. Mothers of children who exhibited a stronger response to a vaccination were more likely to interact with their child during the procedure. This could be due to anticipating their child's level of distress or the mothers' behaviour has been governed by their child's response.

Rocha *et al.* (2003) also state that patterns of somatisation are thought to develop throughout childhood and to remain fairly stable in adulthood (Garraalda, 1996) and that children whose previous pain experiences have been more intense or unpleasant have been reported to exhibit more subsequent distress than children whose experiences have been less intense (Bijttebier and Vertommen, 1998; Dahlquist *et al.*, 1986; Frank *et al.*, 1995). Accordingly, children who had more negative experiences with previous medical procedures are more likely to display increased pain reactivity (Rocha *et al.*, 2003).

2.4. Healthcare design

2.4.1. Products

There has been considerably more research conducted into the effects of environmental factors on a patient's psychological wellbeing than that of product or instrument design. To date, where research has been undertaken with medical devices, it has focused on the importance of user requirements and the benefits of user involvement in the design (e.g. Shah and Robinson, 2006, 2008; Martin *et al.*, 2006). The ergonomics of medical device design covers aspects such as improving patient safety, device effectiveness and reducing the need for device recall etc. However, this research is either limited or underreported in the published literature and that which is published tends to be in the social science literature (Shah and Robinson, 2008). The principles of good ergonomics and human-centred design are especially important in stressful situations (Norman, 2002), which should include the possible psychological repercussions of a design.

**Somatisation refers to 'high rates of complaint about bodily disturbances, discomfort and dysfunction out of proportion to pathology' (Garraalda, 1996; Rocha et al., 2003).*

2.1.4.1. Standards and Regulations

There are stringent standards and regulations for the design of medical devices due to the nature of their functional performance with safety being of primary importance. Currently, medical device regulations vary considerably across the world, making compliance a complex and difficult process. Two of the most important regulations for developers to consider are the EC Medical Device Directive 93/42/EEC and the US Food and Drug Administration regulations, as compliance with these are required to market and sell devices in the European Community (via the CE mark) and the USA respectively. The main focus of these, and other medical device regulations across the world, is on risk management, the aim being to ensure that devices do not compromise the clinical condition, safety of patients or health and safety of users (Martin *et al.*, 2008). These regulations mean there are various restrictions to the way such devices can be designed. But, providing the functional requirements of a device are met there could still be scope, from an aesthetic perspective, for making the devices or instruments less clinical looking and potentially reduce stress levels for younger patients.

Currently the standards for primary care practice equipment are governed by the Care Quality Commission. The Care Quality Commission essential standards of quality and safety (March 2010) apply to GP surgeries, and Regulation 16 covers the safety, availability and suitability of equipment (Figure 2.1). This regulation does not make any reference to the way equipment is designed, only how it is used.

Regulation
➔

What do the regulations say?

Safety, availability and suitability of equipment

16.—(1) The registered person must make suitable arrangements to protect service users and others who may be at risk from the use of unsafe equipment by ensuring that equipment provided for the purposes of the carrying on of a regulated activity is—

- (a) properly maintained and suitable for its purpose; and
- (b) used correctly.

(2) The registered person must ensure that equipment is available in sufficient quantities in order to ensure the safety of service users and meet their assessed needs.

(3) Where equipment is provided to support service users in their day to day living, the registered person must ensure that, as far as reasonably practicable, such equipment promotes the independence and comfort of service users.

(4) For the purposes of this regulation—

- (a) “equipment” includes a medical device; and
- (b) “medical device” has the same meaning as in the Medical Devices Regulations 2002.

Regulation 16 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 2.1. Care Quality Commission Regulation 16

2.4.2. Environments

Healthcare facility design traditionally has had an emphasis on the functional efficiency from a pathogenic perspective (i.e. reduction of infection or disease risk exposure) (Ulrich, 2001). However, many of these facilities are considered to be ‘psychologically hard’ (Ulrich, 1991) with respect to a patient’s psychological needs and well-being. These ‘hard’ environments, as a consequence of poor design, are said to fail because they are stressful or otherwise unsuited to the psychological needs of patients, visitors and staff (Ulrich, 1991). They can increase the likelihood of negative consequences such as anxiety, elevated blood pressure (e.g. Wilson, 1972; Ulrich, 1984) and stress and be, therefore, detrimental to care quality (Ulrich, 1991, 1992; Horsburgh, 1995).

Ulrich *et al.* (2008) conducted a review of the research literature on evidence-based healthcare design and looked at implications for designing better and safer hospitals. They performed an exhaustive search for empirical studies using thirty-two key words that referred to patient and staff outcomes, physical environmental factors and other healthcare-related issues. The literature found was then screened for quality, whether it was empirically based

or not and if it examined the influence of environmental characteristics on patient, family or staff outcomes. They found that well-designed physical settings play an important role in making hospitals safer (i.e. single-bed rooms reduce airborne, contact and waterborne transmissions of infections), more healing for patients (i.e. exposure to nature lessens stress and anxiety and an effective positive distraction) and better places for staff to work (i.e. access to sufficient natural light has been linked with higher staff satisfaction). Their literature review, however, consisted of relatively few randomised controlled trials which, in medical fields, is considered the strongest research design for generating the most credible empirical evidence.

McCormick and Shepley (2003) reviewed the involvement of consumers/end-users in research and development of therapeutic environments. They pay reference to Ulrich's theory (Ulrich, 1991) that 'therapeutic environments' improve medical outcomes by reducing stress, enhancing social support and offering positive distractions such as art, music and access to nature. They also argue that there are designers, clients (e.g. NHS), and users (patients), but that the main communication is between designers and clients with a lack of consumer involvement in design processes, and in particular, healthcare design processes.

2.4.2.1. Interior Design

Knowledge about the impact of interior environments in healthcare facilities on the well-being of patients has been a growing, albeit slowly, field of research with many studies focusing on the psychological impact these environments can place upon patients. Distractions used frequently in healthcare settings include gardens, and art with emotionally appropriate images and nature (Marberry, 2006). People, including children, have a strong tendency to make interpretations of their environment (Kent and Dalgleish, 1986).

Psychologically supportive surroundings should be a critical goal for designers with the aim of promoting wellness (Ruga, 1989). Ulrich (1991) states that these supportive surroundings are considered to facilitate patients coping with the major stress that can accompany illness and foster the process of recovery. Unsupportive design or 'hard' settings can raise obstacles to coping with stress and add to the burden of illness, which in turn can work against the process of healing.

Several studies (Stamps, 1990; Bateson and Hui, 1992; Arneill and Devlin, 2002) have focussed on the role of the *perceived* attractiveness and the *perceived* quality of care a healthcare environment may provide. Arneill and Devlin (2002) reviewed the perceived quality of care that a health practice gives purely on the basis of the waiting room environment. Using a technique based on previous research studies (Stamps, 1990;

Bateson and Hui, 1992) they showed over 200 participants from different ages, pictures of 28 distinct types of waiting rooms. The participants rated each waiting room on their perception of the quality of care that each practice gave, and a rating of how comfortable they would feel in each of the 28 waiting room environments. Their hypothesis was that the perceived quality of care and comfort would be greater for waiting rooms that were nicely furnished, light, had artwork and were warm, was supported by their results. They concluded that the perceived quality of care was as important as the actual quality of care. A thorough analysis of the data was presented, however, they do not state the exact process of data collection and there was also no critical examination of the researcher's role and possible research bias during the data collection.

Many studies report on the stress-reducing properties that natural elements have in the built healthcare environment. One such, being the mediation of perceived attractiveness using indoor plants in healthcare environments, to reduce the effects of stress, investigated by Dijkstra, Pieterse and Pruyn, (2008). They reported that being hospitalised is generally associated with feelings of fear, uncertainty, and anxiety (Mason et al., 1965; Pride, 1968) and that stress and anxiety can affect the healing process (Uchino, Cacioppo and Kiecolt-Glaser, 1996; Broadbent *et al.*, 2003). They proposed that aspects of the built environment that can reduce this stress may have beneficial effects on health-related outcomes also, i.e. faster recovery. Most healthcare facilities have been built in urban environments and thus lack the natural resources that patients can be exposed to (Dijkstra, Pieterse and Pruyn, 2008). Research on restorative environments suggests that certain environments are capable of promoting recovery from stress, and shows that especially natural settings have these restorative effects (Hartig *et al.*, 1996). Using a similar technique to Arneill and Devlin (2002), they concluded that indoor plants lead to reduced perceived stress and that, additionally, perceived stress is also a result of the perceived attractiveness of the room. Their experiment was a simulation and so it is not known whether these results can be directly translated into actual healthcare settings.

Although it is still a field that requires more controlled clinical trials, there is enough evidence to indicate that the concept of 'healing environments' remains a promising area for further research (Dijkstra, Pieterse and Pruyn, 2006). A systematic review by Dijkstra, Pieterse and Pruyn (2006) of 30 controlled clinical trials concluded that there were three relevant dimensions of environmental stimuli that affect the psychological well-being of patients, consistent with findings of Harris *et al.* (2002). These are ambient features e.g. lighting and odours, architectural features e.g. spatial layout and room size, and interior design features e.g. colour, artwork and plants. The use of only 30 studies is low when compared with other reviews previously conducted. This was due to the fact only controlled clinical trials were

reviewed. They found that the general notion that the physical healthcare environment affects the well-being of patients is supported, but conclusive evidence is still limited or lacking with regard to specific environmental stimuli.

2.4.2.2. Standards for environments

The Care Quality Commission essential standards of quality and safety outcomes 1, 2, 4-14, 16, 17 and 21 apply to GP surgeries and each outcome references the 2008 Social Care Act where appropriate. On inspection of the standards, there are two regulations that impact on the design of the environments. These are:

- Regulation 12: cleanliness and infection control (Figure 2.2)

Regulation 12 covers aspects of maintaining effective infection control, with no specific mention of types of materials required to be used in environments.

Regulation →

What do the regulations say?

Cleanliness and infection control

12.— (1) The registered person must, so far as reasonably practicable, ensure that—

- (a) service users;
- (b) persons employed for the purpose of the carrying on of the regulated activity; and
- (c) others who may be at risk of exposure to a health care associated infection arising from the carrying on of the regulated activity, are protected against identifiable risks of acquiring such an infection by the means specified in paragraph (2).

(2) The means referred to in paragraph (1) are—

- (a) the effective operation of systems designed to assess the risk of and to prevent, detect and control the spread of a health care associated infection;
- (b) where applicable, the provision of appropriate treatment for those who are affected by a health care associated infection; and
- (c) the maintenance of appropriate standards of cleanliness and hygiene in relation to—
 - (i) premises occupied for the purpose of carrying on the regulated activity,
 - (ii) equipment and reusable medical devices used for the purpose of carrying on the regulated activity, and
 - (iii) materials to be used in the treatment of service users where such materials are at risk of being contaminated with a health care associated infection.

Regulation 12 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 2.2. Care Quality Commission Regulation 12

- Regulation 15: safety and suitability of premises (Figure 2.3)

Regulation 15 refers to the suitability of facilities chosen to be used and how these can be utilised effectively for primary care purposes. Architecturally, there is no more detail stated than a 'suitable design and layout'.

Regulation →

What do the regulations say?

Safety and suitability of premises

15.—(1) The registered person must ensure that service users and others having access to premises where a regulated activity is carried on are protected against the risks associated with unsafe or unsuitable premises, by means of—

- (a) suitable design and layout;
- (b) appropriate measures in relation to the security of the premises; and
- (c) adequate maintenance and, where applicable, the proper—
 - (i) operation of the premises, and
 - (ii) use of any surrounding grounds,which are owned or occupied by the service provider in connection with the carrying on of the regulated activity.

(2) In paragraph (1), the term “premises where a regulated activity is carried on” does not include a service user’s own home.

Regulation 15 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 2.3. Care Quality Commission Regulation 15

2.4.3. Healthcare Design and Emotion

Two research studies have concerned the emotions children have towards healthcare products and examined how the aesthetic design of the product could help influence and alter these emotions.

The first, Desmet and Dijkhuis (2003), introduced an approach to emotion-driven design and demonstrated it with children’s wheelchair design. They chose wheelchairs as good examples of products that, to some degree, have an unpleasant emotional impact. They are designed on the basis of demands, i.e., ergonomics, usability etc., and children’s wheelchairs look like ‘scaled down’ adult wheelchairs. To begin the process Desmet and Dijkhuis measured the emotional responses of eight children and their parents towards existing wheelchairs using PrEmo (Desmet, 2002) which is a non-verbal self-report instrument that measures 14 emotions often elicited by product design. Although there was a lack of detail in the rigour of the data analysis, the results were transformed as starting

points for a new design with the use of a theoretical model of product emotions (see page 25, Fig. 2.10). The emotional impact of the new design was evaluated using a different set of eight children and their parents and it was found that the new design differentiated in a positive way from existing models (with respect to the emotional impact). The researchers claim that the study illustrates emotion-driven design can benefit from theories of emotion and offer designers ways of discussing emotional impact of design characteristics on users. They also consider the impact of emotion-driven design on non-users, which in this case were the parents. Further studies replicating this approach of focusing on the emotional impact of a design instead of general subjective experiences would be required but with larger sample sizes to help validate these findings.

In the second study, Reynolds and Lu Liu (2010) looked at children's emotional responses and its application to the redesign of a traditional dental handpiece (dentist drill). Statistics found that children often feel fear around dentists, and that this fear provokes great emotional anxiety whilst also inhibiting the dentist's ability to do their job. With the use of a survey carefully designed for children of different ages and distributed to a school, they found that one of the main contributing factors was the design of the handpiece and so a process was developed to redesign an existing paediatric dental drill. The analysis process was supported with rigorous statistical evidence and by examining not only the needs of the dentists but also the emotional effects of design on children. This led to the redesign of a new paediatric dental drill.

2.4.4. Healthcare Environments for Children

Shepley (2001), reported an overview of research on healthcare environments for children and their families by discussing the nature and quality of research in the field and the type of research available. Shepley established that of the 85 published studies that Rubin *et al.* (1998) had reviewed, only three were directed at children suggesting that information in this area is insufficient. Along with the lack of theory and research regarding paediatric environments, Shepley also brings to light the argument that if we believe children are more sensitive to the environment, then more attention should be placed on children. In addition, if we believe that children respond to the environment differently than adults, then we will not be able to generalise the results of adult studies to paediatric populations (Shepley, 2001).

Figure 2.4 is a generalised graph that Shepley uses to show the sensitivity of people to the physical environment. It is arguable that it is less at birth due to the underdeveloped nature of sensation and perception, and increases into late adolescent and early adulthood, at which point it tapers off as our senses become less acute (Shepley, 2001).

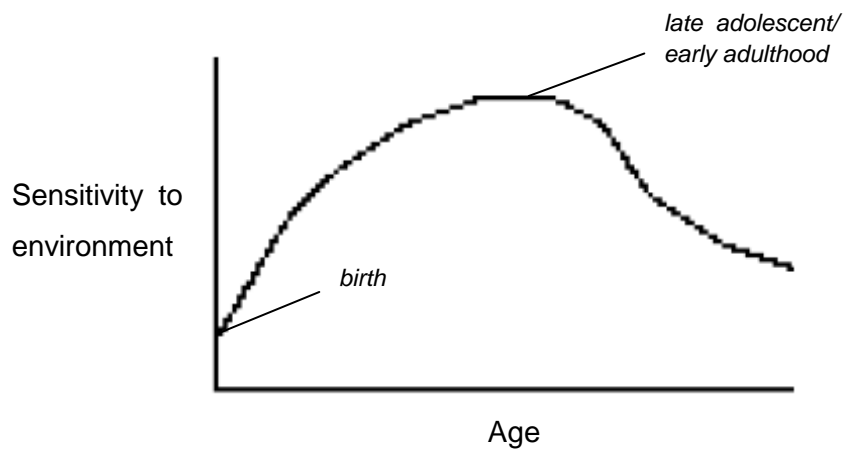


Figure 2.4. Theoretical relationship based on sensation/perception

Shepley places her research in the context of an existing framework. Lawton and Nahemow's (1973) environmental press theory suggests that when individuals become more stressed (as they do when they are ill) they are less capable of coping with negative aspects of the physical environment. Based on the argument Shepley puts forward, children may be even more vulnerable to this effect (see Figure 2.5).

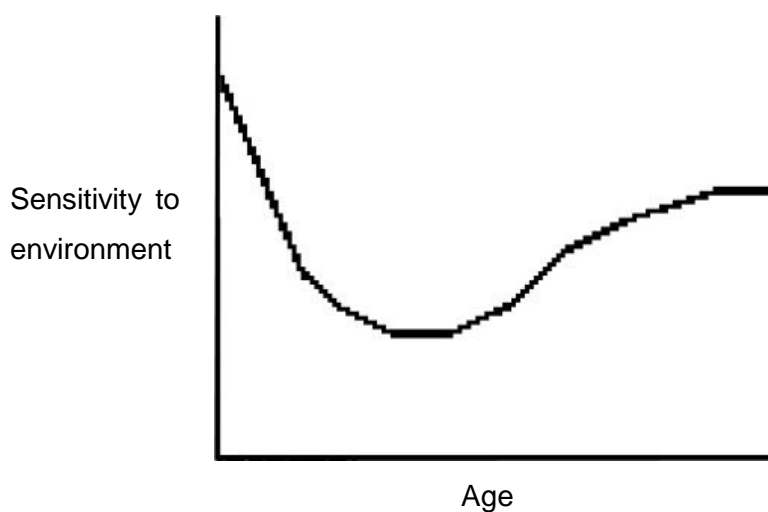


Figure 2.5. Application of the Environmental Press Theory

In conclusion, Shepley states that more researchers need to address the paediatric population in their studies, and that architects must avoid jumping to conclusions by drawing on adult research. She also states the importance of researchers and designers collaborating to achieve appropriate paediatric healthcare environments.

Bishop (2008) also identified the advantages of participatory research to paediatric design. Bishop claims that ignoring children as experts in their experience undermines the soundness of research that claims to reflect children's experience. Evidence-based practice and evidence-based design are the modern orientations in healthcare contexts but we cannot claim to be doing either in relation to children and young people because there is so little evidence available in relation to their experience (Morison *et al.*, 2000; Bishop, 2008).

Bishop identified key attributes within the physical environment and their function within a supportive environment as being important to children and young people. Amongst these attributes were three environmental aesthetic components; artwork, colour and brightness. These three components were found to contribute to children's estimation of the appropriateness of the environment for them and the child-friendliness of the environment (Bishop, 2008).

2.4.5. Example Healthcare Environments and Products

The environments of focus for this project are the waiting room and treatment rooms in GP surgeries. Products within these environments are the medical instruments used by the healthcare professionals. Examples of these can be seen in Figures 2.6 - 2.9.



Figure 2.6. Waiting room example 1



Figure 2.7. Waiting room example 2



Figure 2.8. Treatment room example



Figure 2.9. Medical equipment examples

2.5. Design and Emotion

The main areas of focus for this research, as already stated, will be on the products (i.e. medical instruments) used and the two main environments in primary care: waiting rooms and treatment rooms.

2.5.1. Product Emotions

Arnold (1960) states “all human interactions involve emotions, including interaction with our material world.” We all know from our personal experiences that products can elicit strong emotional responses (Elokla and Hirai, 2012). Likewise, most designers will probably agree that it is advisable to design products that elicit emotions that are experienced as pleasant or desirable (Desmet and Dijkhuis, 2003). It is important for designers to understand the relationship between the benefits they design into a product and the nature of the consumption experience, as determined by its emotional content (Chitturi, Raghunathan and Mahajan, 2008).

The concept of affect refers to a variety of psychological states such as emotions, feelings, sentiments and moods etc. Of the states, emotions are most relevant for product experience

because only they imply a one-to-one relationship between affective state and a particular object: one is afraid of something, angry at someone, happy about something, and so on (Frijda, 1986). “It might seem difficult to find general relationships between product appearance and emotional responses because emotions are essentially personal. Nevertheless, although people differ in their emotional responses to products, general rules can be identified in the underlying process of emotion eliciting” (Desmet and Hekkert, 2002, pp.59).

The current most widely adopted theory of emotions is the appraisal theory. According to this theory an emotion is elicited by the evaluation (appraisal) of an event or situation as potentially beneficial or harmful (Desmet, 2002). It is the interpretation of the event (or product), rather than the event itself, which causes the emotion. An emotion is not elicited by a product as such, but by the appraised significance of this product for our concerns (Desmet, 2002; Norman, 2003).

2.5.1.1. Appraisal Theories of Product Emotions

Ortony, Clore and Foss (1988) developed a cognitive model that determined there were three major aspects to the world we focus on: events for their consequences, agents for their actions and objects because we are interested in certain properties of them. Desmet and Hekkert (2002) adjusted this model to show these three elements could help towards explaining emotions that result from product perception. This model is shown in Figure 2.10.

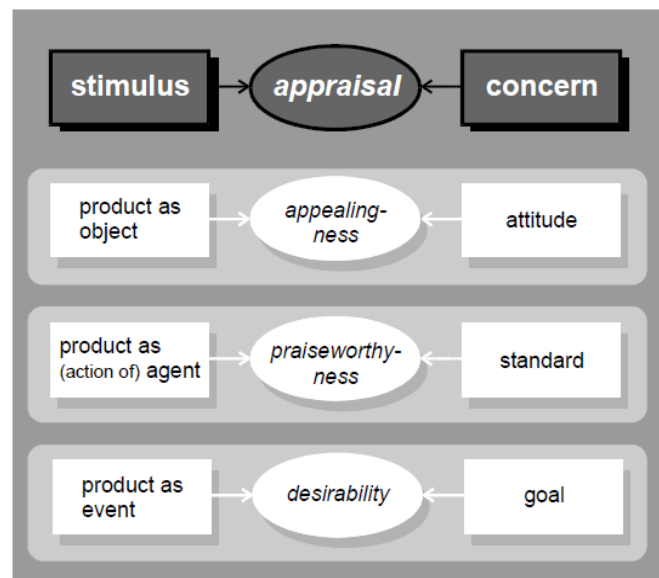


Figure 2.10. Model of product emotions (Desmet and Hekkert, 2002)

Desmet and Hekkert argue that emotions arise because products “touch upon personal concerns”. Ortony *et al.* (1988) called this type of concern ‘attitudes’ or ‘tastes’. For example, when a product corresponds with an attitude or aesthetic concern, it is appraised as appealing. Desmet and Hekkert also state that this model reveals it is possible a product elicits numerous emotions simultaneously. For example, a car could be desired for its beautiful design, but also disliked for its negative impact on the environment.

This particular model was used as a basis to developing a tool (the Emotion Navigator, Desmet, 2002) to assist designers in understanding the emotional influence of their designs. They stated that although the model cannot support the designers with general rules as emotional responses to products will be personal to each user depending on their concerns, it does nonetheless reveal some general patterns. The model was also based on cognitive models and not through field research using participants.

During Desmet’s (2002) doctoral thesis, he describes the development of a model that explains *how* products elicit emotions (Figure 2.11). Throughout the model development, special attention was given to explaining three characteristics of product emotions: products are personal, temporal and mixed. Although differing appraisal theories with the aim of explaining the process of emotions have been developed, researchers generally agree that each particular emotion is the outcome of a unique appraisal (e.g. Arnold, 1960; Lazarus, 1991; Desmet, 2002).

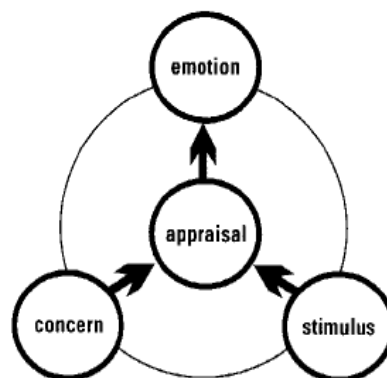


Figure 2.11. Basic model of emotions (Desmet, 2002)

This model, visualising the eliciting process of emotions, was drawn up on the basis of the definition by Arnold (1960) that emotion is “the felt tendency toward anything intuitively appraised as good (beneficial) or away from anything intuitively appraised as bad (harmful).” It was also based on the appraisal models developed by psychologists such as Ortony, Clore and Foss (1988), Lazarus (1991) and Roseman (2001). It is the interplay of the three

key variables (appraisal, concern and stimulus) that determine if a stimulus (e.g. a product) elicits an emotion. Again, this model is based on other models, and not through field research.

In 2007, Desmet and Hekkert put forward a general framework (Figure 2.12) explaining product experience that applies to all affective responses that can be experienced in human-product interaction. They identified three distinct components/levels to product experience: aesthetic pleasure, attribution of meaning, and emotional response.

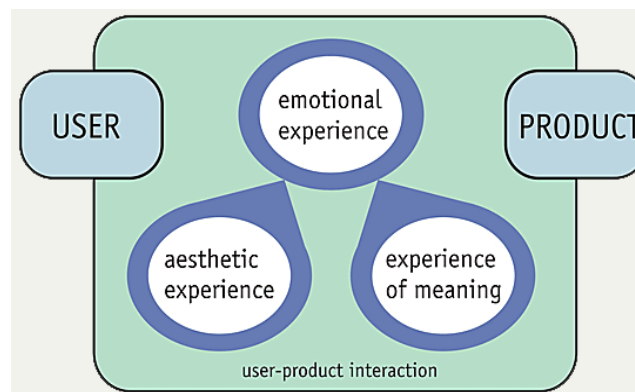


Figure 2.12. Framework of product experience (Desmet and Hekkert, 2007)

At the aesthetic level, it is considered to be the design of a product's appearance (for example) to delight one or more of the sensory modalities. For example, a product can be beautiful to look at, make a pleasant sound, feel nice to touch, or even smell nice. Experience of meaning refers to cognitive experiences like interpretation or memory that enable us to, for example, assess the personal or symbolic significance of a product. Emotional experience is referring to the affective phenomena in everyday language about emotions. For example this could be love and disgust, fear and desire, pride and despair (Desmet and Hekkert, 2007).

There are arguably two perspectives of a product, that of the designer and that of the user. There is often a mismatch between these two perspectives, but these mismatches as well as the matches contribute to the affective reactions that people have to products (Bagnara and Smith, 2006).

The designer works towards a set of constraints, such as, functionality, physical limitations, appearance and costs etc., that are defined by the product specifications. For the user, they also consider functionality and appearance as important but for different reasons to that of

the designer. For the user, these are the two aspects that are principal to the affective reaction to a product. Bagnara and Smith (2006) focused on three kinds of users' emotional reactions to products. They relate to what Norman (2004) referred to as visceral (appearance), behavioural and reflective. Figure 2.13 shows the relationships between the views of the designer and of the user.

Differences between the designer and user perspectives of a product are especially evident with respect to the role of emotion. The emotions the user experiences may not be as the designer intended. This is due to the fact that although the designer can try and evoke certain emotions through their design, ultimately emotions exist in the user rather than the product itself i.e. the memories a product may provoke in the user are out of the control of the designer. This means the designer can have more control over the visceral and behavioural reactions of users', than over the reflective ones.

Of particular interest to Desmet are the visceral reactions to products. These reactions being due to the appearance of a product are also referred to as aesthetic emotional reactions, or aesthetic emotions. These types of emotions will play a vital role towards the overall aim of providing design recommendations for primary care environments and products. As the focus will be towards young children, the aesthetic component will be of most relevance and have the most impact due to the differences in children's developmental level at different ages.

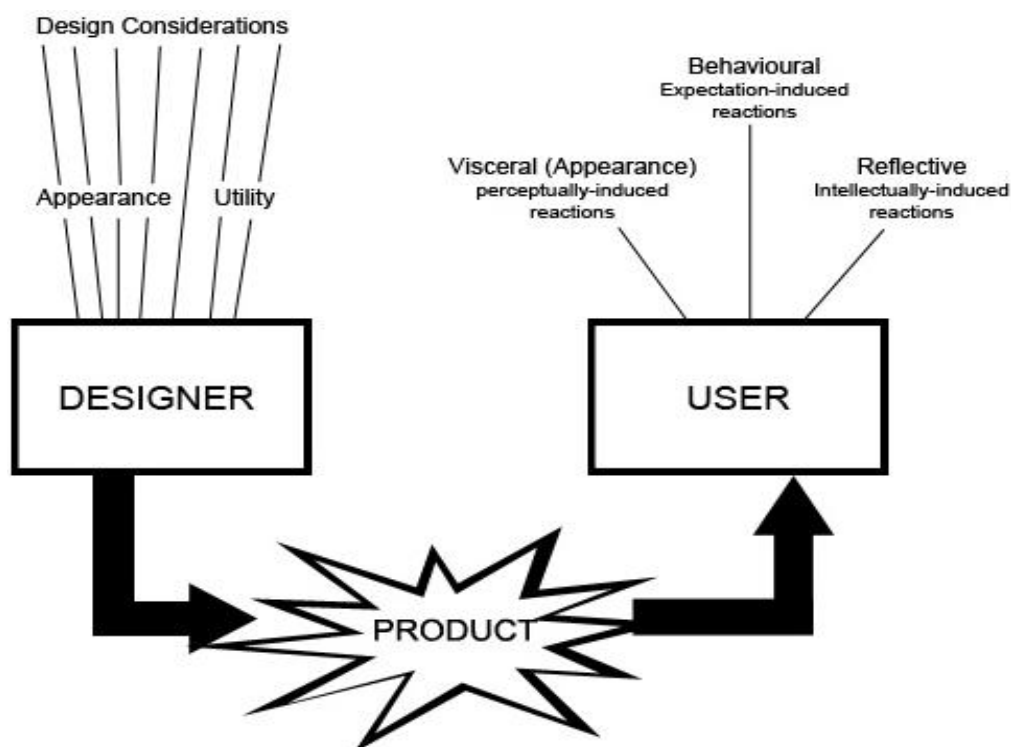


Figure 2.13. The designer's view and user's view of a product (Bagnara and Smith, 2006)

2.5.2. Aesthetic Emotions

In 'mainstream' emotion psychology, the object of study is emotions in general, or of particular emotions such as happiness or disgust. A special case is the topic of 'aesthetic emotions,' i.e. emotions elicited through a stimulation of our senses by things like works of art or natural landscapes (Desmet, 2002). Lazarus (1991) concluded in his cognitive theory of emotions, that aesthetic emotions do not require special concepts and that they can be explained with the same appraisal as 'real' emotions. Desmet goes on to state that the same applies to product emotions. He concludes that product emotions don't represent a special type of emotion but are the same as the emotions experienced towards people and events.

An aesthetic experience involves pleasure or displeasure. People are motivated to seek products that provide pleasure and avoid products that provide displeasure, and it is this that gives rise to an emotional experience. Some emotion researchers consider an aesthetic experience to be a specific type of appraisal (e.g. Lazarus, 1991) that evaluates whether a stimulus is pleasurable or painful which determines the response. These emotional experiences, however, are restricted to the time of interaction. Once the interaction comes to an end, the experience also stops (see Norman, 2004).

Chitturi (2009) adopted a 'two dimensional product benefit framework' based on marketing literature exploring the relationship between product design, consumption experience, negative emotions and customer loyalty (Batra and Ahtola, 1990). These two dimensions are 'hedonic' and 'utilitarian' design benefits. Hedonic benefits are those referring to aesthetic benefits and utilitarian benefits are those referring to functional benefits. Kivetz and Simonson (2002) documented that greater weight is attached to the utilitarian element, unless the consumers believe they have "earned the right to indulge." Contradicting this, however, are Chitturi, Raghunathan & Mahajan (2007) who document that consumers attach more importance to the hedonic element, but only after a necessary level of functionality is fulfilled.

Chitturi (2009) concludes that designers, and indeed marketers, should understand the full breadth and depth of the positive and negative promotion and prevention of emotions of consumers, and be aware that these emotions are evoked by the hedonic and utilitarian design benefits offered by a product. Emotions play a key role in marketing and advertising, but despite strong appeal, emotions have played little in the way of a formal role in the design profession until recent years. Additionally, there are only some generally accepted standards such as the widely used Ortony, Clore and Collins (1988) model for the cognitive analysis of emotions (Norman, 2003).

2.5.3. Environments and Emotions

Positive distractions are a small part of environmental conditions that research has shown effectively reduces stress. One of the distractions known to have positive effects is that of viewing nature. Ulrich *et al.* (1991) reported that an encounter with unthreatening natural environments will have a stress reducing/restorative influence. They put forward that the emotional, attentional and physiological aspects of the stress reducing influences of nature are derived from psycho-evolutionary theory. This theory states that the restorative influences of nature involve a shift towards more positively-toned emotional states (Ulrich *et al.*, 1991).

Environmental psychologists suggest people react to places with two general, and opposite forms of behaviour; approach and avoidance (Mehrabian and Russell, 1974). Approach behaviours are positive behaviours that might be directed at a certain place, such as a desire to stay or explore. Avoidance behaviours are the opposite, i.e. a desire to *not* stay or explore. Russell and Mehrabian (1978) hypothesized that an approach towards an environment and the desire to affiliate there, is influenced by the emotion-eliciting quality of that environment. They conducted two studies using undergraduates (n = 200, 310) and showed them coloured photographic slides of different physical settings: urban, suburban, rural, wilderness areas; various climates; interiors and exteriors of buildings; scenes with and without persons; and scenes from various countries and continents. They presented the slides one at a time and asked the participants to imagine how they'd feel in the setting shown in the slide. They then rated their emotional reaction to the setting using Mehrabian and Russell's (1974) scales of pleasure, arousal and dominance. As they predicted, the approach toward the setting was determined by three factors:

- (1) A main effect of the environments pleasantness;
- (2) An interaction effect such that approach varied directly with arousing quality of the setting in pleasant settings, but inversely with arousing quality in unpleasant settings; and
- (3) A weak inverted-U relationship with the lowest arousing quality in the neutrally pleasant-unpleasant settings, and highest approach in moderately arousing settings (Russell and Mehrabian, 1978).

Due to the methodology, however, the external validity of the results is questionable. In other words, can the results be generalised to actual behaviours in actual settings.

Investigators have reliably found that stress-reducing or restorative effects of looking at nature are manifested as a collection of positive changes characterised by heightened

positive feelings, reduced negative emotions, and changes in physiological systems indicating lower stress mobilisation (Parsons and Hartig, 2000; Marberry, 2006).

2.5.4. Emotion

It is important to distinguish emotion from other phenomena. The term ‘emotion’ tends to be used interchangeably in the literature with other terms such as ‘feeling’, ‘attitude’ or ‘mood’. These terms are also collectively referred to as ‘affective states’ or ‘affect’. However, there are distinct differences between them and it is important to distinguish these. Table 2.4 summarises some of the differences between the affective states.

Table 2.4. Definitions of affective states

Emotions	...are intentional because they imply and involve a relation between the person experiencing them and a particular object, i.e. one is afraid <i>of</i> something, proud <i>of</i> something, in love <i>with</i> someone etc. (Frijda, 1994). In addition, people are usually able to identify the object of their emotion (Ekman and Davidson, 1994).
Feelings	...presumed to have an important monitoring and regulation function. Suggested that ‘feelings integrate the central representation of appraisal–driven response organization in emotion’ (Scherer, 2005).
Attitudes	...relatively enduring beliefs and predispositions towards specific objects, events or persons. Attitudes do not need to be triggered by event appraisals although they may become more prominent when thinking of the attitude object. Intensity is generally weak and behavioural tendencies are often overridden by situational constraints (Scherer, 2005).
Moods	...tend to have a relatively long-term character. Like emotions, they are acute states that are limited in time. Unlike emotion, moods are essentially non-intentional. Moods are not directed at a particular object but rather at the surroundings in general or at ‘the world as a whole’ (Frijda, 1994, in Desmet, 2002).

Arnold (1960), a pioneering psychologist in the cognitive perspective of emotion, gave an early definition of emotion as “the felt tendency toward anything intuitively appraised as good (beneficial) or away from anything intuitively appraised as bad (harmful).” This definition adheres to the view that emotions are influential. In this view, emotions are considered to serve an adaptive function because they establish our position in relation to our environment, pulling us toward certain people, objects and ideas, and pushing us away from others (Frijda, 1986).

Emotions are personal, and no one will have the same emotional experience in the same situation or towards the same object. However, there are certain scenarios in our day to day lives where a generalised state of emotion (i.e. positive or negative) can be applied. For example, the relationship between stress and negative emotions tends to be associated for most people. Stress can increase the amount of negative emotions a person experiences, and negative emotions can contribute towards the onset of stress. This cycle ultimately relies on the individual's ability to both cope in times of stress and combat negative emotions.

There are arguably three distinct perspectives on the theory of emotion. These are the evolutionary, bodily-feedback and cognitive theories and a summary of these can be seen in Table 2.5.

2.5.5. The Relationship between Emotion and Stress

It is well documented that negative emotional states tend to accompany stress, and people often use these emotional states to evaluate their stress (Sarafino, 2008). Stress is, in fact, a process embracing several components including stressors. These stressors are defined as events that pose a challenge to an individual and their psychosocial mediators which are thoughts that enable the individual to evaluate the nature of the situation. The stress response is typically a measure of the emotional reaction elicited in response to these stressors (Paterson and Neufeld, 1989). Threat, the subjective appraisal of the potential negative effects of a stressor, is also a key concept in understanding stress (DiMatteo, 1991).

Lazarus and Folkman (1984) argue that an individual continually appraises and reappraises the environment and his or her efforts at coping with it. Additionally, they agree that coping is a dynamic process through which the individual manages the demands of the person-environment relationship that are appraised as stressful, and the emotions they generate. Coping efforts have been said to fall into two major functional categories: problem-solving efforts and efforts at emotional regulation (Folkman and Lazarus, 1988; Skinner *et al.*, 2003). Problem-solving efforts involve taking direct action to change a stressful situation or to prevent or reduce its effects. Efforts at emotional regulation involve attempts to regulate or reduce the emotional, and the related social, consequences of the stressful event (DiMatteo, 1991). One way is attempting to lessen the increase of negative emotions and to focus on the improvement of experiencing more positive emotions. Just as negative affect can make some simple tasks difficult, positive affect can make some difficult tasks easier (Norman, 2002). Folkman and Lazarus (1988) interviewed married couples over five months about recent stressful encounters and found evidence that coping is a significant mediator or emotional response in stressful encounters. They also found planful problem-solving and

Table 2.5. Theories of Emotion

Theory	Pioneer	Description	Example	Applied to Products
Evolutionary theory	Charles Darwin	In his work 'the expression of the emotions in man and animals' he refers to emotions as a result of natural selection. He claims emotions are functional for the survival of a species/individual (Darwin, 1872). Another evolutionary scientist (Plutchik, 1980) describes that the function of emotions is to "help organisms to deal with key survival issues posed by the environment".	For example, fear initiates an impulse to run away in order to survive a threatening situation.	By using this theory of how emotions are elicited we can demonstrate the role external stimuli play (events, objects, etc.). However, it does not help explain how a specific product elicits emotions. The emotions referred to in the evolutionary perspective are emotions such as fear or happiness which are also known as 'universal human emotions'. Emotional responses to products, as already stated, tend to be personal and so will not be universal, but specific to an individual.
Bodily-feedback theory	William James	He put forward that the experience of an emotion is the result of a 'bodily change' and argued that it is this 'change' that is the emotion (James, 1884; James, 1994). This perspective is saying that emotions are not only the outcome of, but are also differentiated by, bodily changes.	Using the example of fear; when we shiver and have an increase in pulse rate, we perceive these reactions as being afraid.	This theory does not explain the role of external stimuli and many psychologists believe that the concept that emotions are based on a bodily change is too simple (e.g. Frijda, 1986; Lazarus, 1991).
Cognitive theory	Magda Arnold	Emotions are said to generate from our individual judgements/perceptions about the world. Arnold (1960), stated that an "emotion always involves an assessment of how an object may harm or benefit a person." Without appraisal there can be no emotion, because all emotions are initiated by an individual's appraisal of their environment (Desmet, 2002).	For example fear, we appraise/perceive something as harmful or painful, possibly due to previous experiences or cognitive reasoning.	This, as described by Desmet (2002), is the most promising theory towards explaining product emotions, as it describes an explanation to why different emotions are experienced towards the same product by different people. It is also the only theory that has been applied to products already.

positive reappraisal contributed to an improved emotional state. However, the subject demographic was entirely married couples with one child or more and so further studies with a wider subject demographic would be needed to help confirm these findings.

Folkman and Lazarus (1988) put forward that emotion and coping occur in a dynamic mutually reciprocal relationship. It begins with appraisal of an environment that is seen as significant for the person's well-being (i.e. as harmful, beneficial, challenging or threatening). This appraisal influences coping and changes the person-environment relationship, and hence an emotional response. Coping consists of cognitive and behavioural efforts to manage specific external/internal demands that are appraised as challenging or exceeding the resources of the person (Folkman and Lazarus, 1988).

2.5.6. The Effect of Positive Emotion

Many studies have shown that positive emotions have a wide range of effects on individuals (see Lyubomirsky, King and Diener, 2005; Pressman and Cohen, 2005). Both theoretical and empirical work indicate that positive emotions promote flexibility in thinking and problem-solving (Isen, Daubman and Nowicki, 1987; Fredrickson and Branigan, 2003), counteract the physiological effects of negative emotions (Fredrickson and Levenson, 1998; Ong and Allaire, 2005), facilitate adaptive coping (Folkman and Moskowitz, 2000, 2004), build enduring social resources (Fredrickson and Branigan, 2001; Keltner and Bonanno, 1997), and spark upward spirals of enhanced well-being (Fredrickson, 2000; Fredrickson and Joiner, 2002; Ong *et al.*, 2006).

One way in which positive emotions may play a role in adaptation has been proposed by Zautra *et al.* (2001) in their dynamic model of affect (DMA). One implication of the DMA is that positive emotions are more likely to diminish negative emotions on days of elevated stress. Zautra *et al.* also suggest that a relative deficit in positive emotional experience is likely to leave individuals more vulnerable to the effects of stress. In contrast to other models of stress and coping, which view emotional adaptation entirely in terms of regulating psychological distress, the DMA takes into account both negative and positive emotions in the stress process. The model predicts that under ordinary circumstances, positive and negative emotions are relatively independent, whereas during stressful encounters an inverse correlation between positive and negative emotions increases sharply (see Reich, Zautra and Davis, 2003). Another implication of the DMA is that positive emotions are more likely to diminish negative emotions on days of elevated stress and that a relative deficit in positive emotional experience should leave individuals more vulnerable to the effects of stress.

Ong *et al.* (2006), using this model together with other findings, suggests that the experience of positive emotions among challenge and adversity may contribute to stress resistance, and hence adaptation, by interrupting the on-going experience of negative emotions during times of stress. In addition to offsetting the immediate undesirable consequences of stress, positive emotions may also play an important role in recovery processes. Positive emotions may have both a protective and restorative function, guarding individuals from negative emotions as well as suppressing the after-effects of such emotions (Ong *et al.*, 2006). There is both theoretical and empirical work that indicates that positive emotion may have both a protective function guarding individuals from negative emotions as well as quelling the after-effects of such emotions.

Ong *et al.* also put forward the notion that 'people who have relatively high levels of positive affect experience less negative emotions when under stress and better health'. This suggests that if people are able to experience less negative emotions while in a stressful situation they are more likely to cope better. Ong *et al.* investigated the functional role of psychological resilience and positive emotions in the stress process. They performed two studies exploring naturally occurring daily stressors and one study examining data from a sample of recently bereaved widows. They concluded that over time, experience of positive emotions functions to assist high-resilient individuals in their ability to recover effectively from daily stress. However, all three studies had small sample sizes, there was a reliance on self-reports, and the authors did not assess the social support affecting the stress or emotion. There was also a lack of experimental control over confounding variables.

2.6. Summary

Children and Healthcare: The developmental level of a child or young person affects how they interpret environments and children are not always able to understand what is happening to them when they are ill. Negative response styles to healthcare that children develop when they are young may indicate an increased risk for negative response in later childhood and poorer well-being. Possible parental influences can also impact on children and young person's responses to healthcare. Most literature on children's experiences in healthcare relates to experiences in hospitals, little research exists on experiences within primary care surroundings.

Healthcare Design: Design in healthcare is commonly based on functional effectiveness of environments which work against the psychological well-being of patients, and most research has been conducted on adults. Standards are particularly stringent for medical products due to the nature of the function and the medical market. Recent research has begun to show, however, that a design can be more appealing to young patients if the

appropriate user research has been carried out (Desmet and Dijkhuis, 2003; Reynolds and Lu Liu, 2010). Again, most research on environment design has been conducted in hospitals.

Design and Emotion: Many studies have shown that a person's general experience of well-being is strongly influenced by their day-to-day felt emotions (see Diener and Lucas, 2000). It is essential during times of stress that methods to regulate emotions are considered due to the effect that has on an individual's ability to cope. During events appraised as stressful, emotions play an important role in influencing the coping process. It is, therefore, essential during times of stress that methods to regulate emotions are considered due to the effect that it can have on an individual's ability to cope. Responses to a product are based on a person's appraisal of that product and it is important for designers to understand the relationship between the benefits they design into a product and the nature of the consumption experience, as determined by its emotional content (Chitturi, Raghunathan and Mahajan, 2008).

2.7. Research methodology

The section details the types of methodologies used to conduct research. There are varying methods of data collection such as quantitative methods, qualitative methods and mixed methods approaches. Research on these three approaches was conducted in order to establish the most appropriate approach for this research thesis and its objectives.

2.7.1. Quantitative methods

Quantitative research consists of methods where the resulting data takes the form of numbers and is 'quantifiable'. This data can be used, for example, to test hypotheses or explore connections between parts of the data (correlations and associations). They are primarily associated with surveys and experiments but also questionnaires and observation (Denscombe, 2007). Robson characterises quantitative research as the following:

- Measurement and quantification is central – accuracy and precision of measurement is sought
- A focus on behavior (i.e. on what people do or say)
- A deductive logic is adopted where pre-existing theoretical ideas or concepts are tested
- Design of the research is pre-specified in detail at an early stage of the research process
- Reliability and validity of measurements are important

- Detailed specification of procedures is provided so that replication of the study is possible
- Statistical analysis of the data is expected
- Generalisability of the findings is sought
- Objectivity is sought and distance maintained between the researcher and participants

Some form of statistical analysis is usually performed on quantitative data. This can range from simple descriptive statistics such as calculating the mean, mode, median or the standard deviation. More in-depth statistics arise when testing for association and difference. These include statistical tests for significance such as the t-test, Mann-Whitney U or Pearson chi-square.

2.7.2. Qualitative methods

Qualitative research can take many forms such as observation, interviews, questionnaires and document analysis and the data can provide rich descriptions and explanations of events. It is often regarded as less valid and reliable than quantitative research but can still be a powerful source of analysis. According to Miles and Huberman (1994) qualitative studies have a quality of 'undeniability' because words have a more concrete and vivid flavour that is more convincing to the reader than pages of numbers (Gray, 2009). Robson (2011) characterises qualitative research as the following:

- Findings are presented verbally or in other non-numerical form (there is little or no use of numerical data or statistical analysis)
- An inductive logic is used starting with data collection from which theoretical ideas and concepts emerge
- A focus on meanings
- Contexts are seen as important
- Situations are described from the perspective of those involved
- The design of the research emerges as the research is carried out and is flexible throughout the whole process
- The existence and importance of the values of researchers and others involved is accepted
- Objectivity is not valued – it is seen as distancing the researcher from participants
- The generalisability of findings is not a major concern
- It takes place in natural settings – artificial laboratory settings are rarely used
- It is usually small-scale in terms of numbers of persons or situations researched

There are various methods for analysing qualitative research data, such as using grounded theory or thematic coding. Grounded theory seeks to generate a theory which relates to the particular situation forming the focus of the study. Robson (2011) defines the theory as being 'grounded' in data obtained during the study, particularly in the actions, interactions and processes of the people involved. Thematic coding analysis is a form of qualitative data analysis that can be performed by hand or by using various software programmes (e.g. NVivo). It can be used to report experiences, meanings and the reality of participants or to examine the ways in which events, realities, meanings and experiences are the effects of a range of discourses operating within society (Robson, 2011). Coding has a central role in qualitative analysis. It is described by Gibbs (2007, pp. 38.) as:

'... how you define what the data you are analysing are about. It involves identifying and recording one or more passages of text or other data items such as the parts of pictures that, in some sense, exemplify the same theoretical or descriptive idea. Usually, several passages are identified and they are then linked with a name for that idea – the code. Thus all the text and so on that is about the same thing or exemplifies the same thing is coded to the same name.'

2.7.3. Mixed methods

Research that combines alternative approaches within a single research project is known as a 'mixed methods' approach. This research strategy combines methods drawn from different traditions with different underlying assumptions (Denscombe, 2007). In other words, it uses both quantitative and qualitative methods. It has been argued that researchers can improve their confidence in the accuracy of findings through the use of different methods to investigate the same subject. The mixed method approach provides the researcher with the opportunity to check the findings from one method against the findings from a different method.

Within a mixed methods strategy contrasting methods can also be used as a means for moving analysis forward, with one method being used to inform another. So in essence, an alternative method is introduced as a way of building on what has been learned already through the use of the initial method. This is different from using another method to produce a fuller picture of things; the new method is introduced specifically to address a research issue arising through findings produced by another method (Denscombe, 2007). Another reason for using a mixed methods approach is that research projects usually include a number of different research questions, so a research method appropriate for one question may be inappropriate for another (Gray, 2009).

Within a mixed method approach the combination of using qualitative and quantitative methods is often implemented. This approach is known as ‘triangulation’. Triangulation includes not only the comparison of different data sources, but also the use of different data gathering techniques and methods to investigate the same phenomenon. Interacting both quantitative and qualitative research methods analysis is known as ‘methodological triangulation’, and using different sources of information is known as ‘data triangulation’ (Guion, Diehl and McDonald, 2011). Integrating multiple data sources of information helps increase the validity of a study.

Sequential triangulation is the use of qualitative and quantitative methods at the same time. In this instance there is “limited interaction between the two datasets during data collection, but the findings complement each other. Sequential triangulation is used if the results of one method are essential for planning the next” (Morse, 1991, pp.120).

2.7.4. Conclusion

Due to this thesis containing more than one research question and data sources, a mixed method approach to data collection involving data and sequential triangulation was deemed the most appropriate research methodology. A combination of both quantitative and qualitative research methods (methodological triangulation) was used in order to achieve the thesis objectives, by using one method to inform another. Figure 2.14 demonstrates the mixed method approach and triangulation methodologies. The following two chapters detail the particular methods chosen in each instance and the results that were obtained.

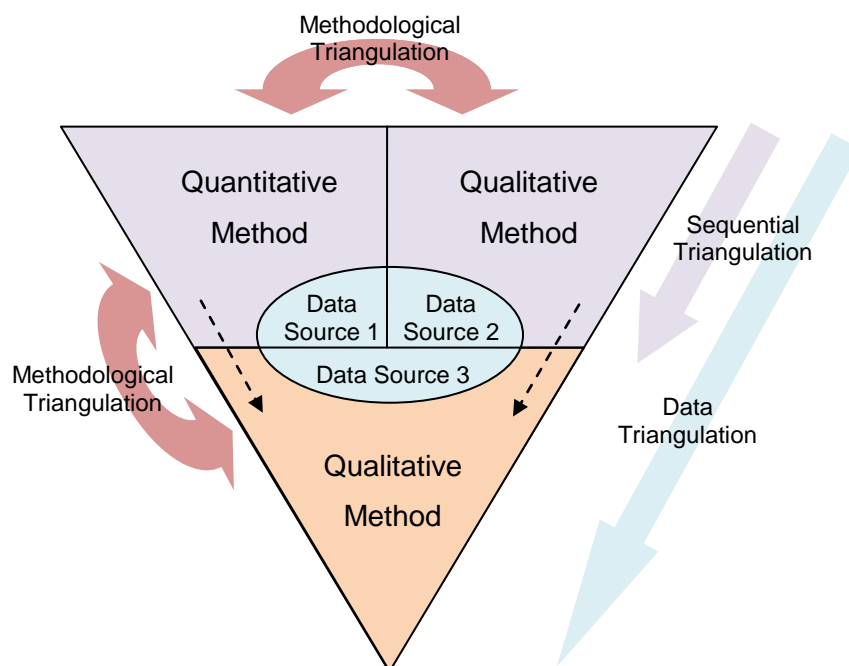
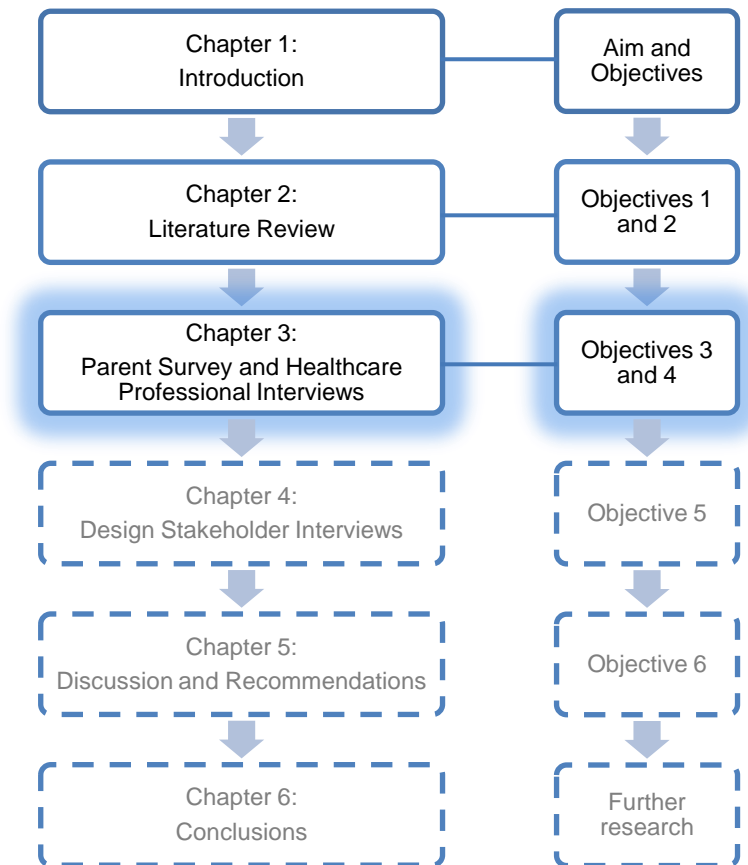


Figure 2.14. Mixed method approach and triangulation methodologies

Chapter 3: Parent Survey and Healthcare Professional Interviews



3.1. Introduction

The study presented in this chapter took a multi-strategy approach involving both a quantitative and a qualitative method: a survey based questionnaire of parents (data source 1), and interviews with healthcare professionals (data source 2). The study was carried out in order to achieve objectives 3 and 4:

- *Objective 3: Explore parent and healthcare professional experiences of healthcare products and environments for children and young people under 18 years*
- *Objective 4: Identify areas for feasible design adjustment/improvement in the waiting room environment, treatment room environment, medical equipment and staff behaviour*

This chapter is structured as follows:

- 3.2. Survey and Questionnaire Literature
- 3.3. Parent Survey Design
- 3.4. Parent Survey Results
- 3.5. Interview literature
- 3.6. Healthcare professional interview design
- 3.7. Healthcare professional interview results
- 3.8. Discussion

3.2. Survey and Questionnaire Literature

The terms 'survey' and 'questionnaire' are described as synonymous and are used interchangeably within literature. However, there is a slight distinction between the two. Surveys are regularly used as a *tool* to administer a questionnaire. A survey is a method of gathering information on a certain population, and a questionnaire can form part of, or all, of the survey in order to gather the required information. Questionnaires are a widely used social research method of collecting data from and about people (Robson, 2011).

Nemeth (2004) describes questionnaires by stating that “the questions asked are the means to elicit what needs to be learned and the questionnaire is the basis for collecting the information. They can be used, for example, to: identify and determine problems, elicit information, test users’ perceptions, discover why people do what they do, reveal routine or out of the ordinary patterns, probe how users make up for inadequacies in products, or learn about conditions to which users cannot adapt.”

Surveys require involvement and an active response from subjects. Robson (2011) states that surveys can be carried out for exploratory, descriptive or explanatory purposes and can provide information about the distribution of a wide range of people of certain characteristics, and of relationships between such characteristics. Surveys are also helpful to obtain opinions, attitudes and preferences of those who have experience in a certain situation, or who hold a certain expertise. Robson also states that “an important aspect of surveys is that the respondents must be able to understand the questions in the way that the researcher intends, have accessible the information needed to answer them, be willing to answer to them, and actually answer in the form called for by the question.” This means the survey has to be written and presented in a way that the intended respondents understand what is wanted from them and that they are happy to give it to you.

Although surveys are able to be administered without the presence of the researcher, the resulting data of surveys can still be put to both descriptive and analytic uses (Czaja and

Blair, 2005; Cohen *et al.*, 2007). Through the flexibility of being able to use both closed and open-ended questions in a survey, both quantifiable and qualitative data can be obtained. The quantitative data, if the questions have been formed appropriately, can be used for statistical analysis such as, for example, to test for significant differences between respondent groups (i.e. geographical location), or relationships between two variables (i.e. household income and number of children in household) or to test for the significance of relevant hypotheses (i.e. respondents in the south of England have a higher income than respondents in the north) (Czaja and Blair, 2005).

Researchers can use survey data to test hypotheses and study causal relationships between variables. The pairing of survey data with advanced analytical methods has become one of the foremost means of social investigation as, on the most basic level, the idea of a survey begins with the desire to know (measure) some unknown characteristics of a population (Czaja and Blair, 2005). These populations could be the elderly, households with young children, or people who own computers.

It is also necessary to choose the most appropriate survey method to obtain the information required. There are four survey methods: mailed surveys, internet surveys, telephone surveys and face-to-face surveys (Czaja and Blair, 2005). Table 3.1 shows the advantages and disadvantages of each method. Self-administered surveys over the internet are often the easiest way of retrieving information about the past history of a large set of people.

Due to time constraints and limited funds available for this research, it was imperative that any methods chosen were to be low cost and that data collection was not too time consuming. In this instance, it was decided a questionnaire was to be used as a context of a survey.

A questionnaire-based survey fulfils both these requirements and, as can be seen in Table 3.1, the best fitting survey method was an internet survey. An internet (or 'online') survey was the appropriate method for the first form of data collection which was to allow anonymity, gather high-level information, in a relatively short period of time, at a low cost and from a specific target population. High-level information from parents on their children's emotional experiences at their local primary care practice was to be collected (objective 2) which would also help identify areas for adjustment and improvement (objective 3).

Table 3.1. Advantages and disadvantages of the four survey methods (adapted from Czaja and Blair, 2005, and Robson, 2011)

Method	Advantages	Disadvantages
Mail surveys	<ul style="list-style-type: none"> - Significantly less expensive than a telephone or face-to-face survey - Respondents may consult household or personal records if required - Successful in the collection of data about sensitive topics - Length of time to conduct is fairly constant - Reasonably high response rate when topic is highly salient to the respondent - Incentives can be used effectively 	<ul style="list-style-type: none"> - Response bias – when one subgroup is more likely to cooperate than another - Respondents can look over survey before deciding whether or not to complete it – therefore it cannot be long or complex - Must be self-explanatory as no one is present to assist – a lack of understanding can affect the quality of responses - Easy for questions to be skipped - No control over what order questions are answered or who fills it in - Answers to open-ended questions tend to be less thorough and detailed
Internet surveys	<ul style="list-style-type: none"> - Low data collection cost - Speed of data collection is high - Ability to obtain reasonably complete and detailed answers to open-ended questions - Respondents may consult household or personal records if required - Anonymity - Only/easiest way of retrieving information about past history 	<ul style="list-style-type: none"> - Eliminates those who do not have the internet - Can have low response rates and resulting potential for response bias - Online surveys must be relatively short (should take no longer than 15 minutes to complete) - Must be self-explanatory - Designing a survey so that respondents must answer each question in order is strongly discouraged – if respondent chooses not to answer or cannot answer a question they are most likely to exit the survey
Telephone surveys	<ul style="list-style-type: none"> - Most widely used survey method - Intermediate in cost between mail and face-to-face - Response rates in range of 40-80% - Length of data collection period usually short - Geographic distribution of sample can be wide - Quality of recorded answers should high - Order of questions can be controlled - Rapport with respondent can be established 	<ul style="list-style-type: none"> - Technologies such as mobile phones, caller ID, internet access, answering machines, call blocking, etc. make it more difficult to contact a household and its occupants - Questions must be short and simple to avoid primacy and recency effects - Inability to use visual aids - Interviewers inability to control response situation and respondents difficulty in consulting household records during interview - Long and detailed answers to open-ended questions are not elicited as often in telephone surveys as in face-to-face interviews
Face-to-face surveys	<ul style="list-style-type: none"> - Data-quality high - Response rates usually higher than for telephone interviews - Sampling frame bias usually low - Response bias usually low - Questions can be more complex - Best method for open-ended questions - Respondents may consult household or personal records if required 	<ul style="list-style-type: none"> - Expensive – compensate interviewer for travel and other expenses - Time to complete a face-to-face survey is longer than any other method - Can be a hesitancy of respondents to report personal or sensitive information - Respondents more likely to provide socially desirable responses when face-to-face with interviewer

3.3. Parent Survey Design

A questionnaire was designed for the survey to extract specific information from parents and guardians about their children's visits to primary care practices. All questions within the survey included (taken from Robson, 2002):

- Simple language
- Short questions
- No double-barrelled questions
- No leading questions
- No questions worded in the negative
- Only questions where respondents are likely to have the knowledge to answer
- Questions that meant the same thing to all respondents
- No ambiguity
- The question's frame of reference made clear (specific time periods stated where necessary)
- No questions that created opinions (a 'neither agree or disagree' answer was always used)

As can be seen in Appendix 3.1, the questionnaire starts with general questions to gather information for demographic purposes, such as identifying the age and sex of the child. Each section required the parents to rate the intensity of emotions their child experienced in relation to three aspects of their local practice. Firstly they were asked about the waiting room environment of their primary care practice. Secondly about the treatment room environment, and thirdly about the medical equipment used by the healthcare professionals.

The emotions that the parents were asked to rate were identified from the literature (Chapter 2). Six emotions were found to be commonly associated with children and their healthcare experiences. The opposing emotions to these six were selected (see Table 3.2) to provide an equal balance of positive and negative emotions.

Table 3.2. Emotions used in parent survey

Positive	Negative
Amused	Shocked
Courageous	Helpless
Excited	Tense
Interested	Bored
Relaxed	Anxious
Trustful	Doubtful

These twelve emotions were presented as a statement and were presented in the survey as ‘My child felt amused’, ‘My child felt anxious’, and so on. The respondent had to state whether they ‘strongly agree’, ‘agree’, ‘neither agree nor disagree’, ‘disagree’ or ‘strongly disagree’ with the statements. Please refer to Figure 3.1 which is a direct extract of the questionnaire showing how these statements were presented. The statements were listed in alphabetical order according to the emotion.

Parent Survey: Children's emotional experiences in local GP surgery environments

YOUR GP SURGERY: THE WAITING ROOM

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Think about the child you have selected and any visits to a GP surgery when they have seen a healthcare professional for a routine check-up, a vaccine, blood test, illness diagnosis, receiving treatment, or anything else.

***6. Please state how much you agree or disagree with the following statements relating to the GP surgery waiting room. This includes everything from the decor, furniture, wall decorations, posters, reception desk, etc. Please indicate your answer by ticking the relevant circle.**

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
My child felt amused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt anxious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt bored.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt courageous.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt doubtful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt excited.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt helpless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt interested.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt relaxed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt shocked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt tense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My child felt trustful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3.1. An extract from the questionnaire

These three sections had the same format and layout except for the addition of a further two statements in the medical equipment section. As can be seen in Figure 3.2 these were:

‘In general, the healthcare professional made an effort to make my child feel relaxed when the use of a medical instrument was necessary.’

‘I consider the aesthetic appearance of the medical instruments contributed to my child’s emotional experience whilst there.’

These questions were added to this section to explore the direct interaction between medical instrument, the healthcare professional using the instrument and the patient. The first question was asked in order to gain insight in to the behaviour of the healthcare professional that was using the instrument and if this had any effect on the child. The second question was to gain insight in to whether the parent felt the appearance of the instrument contributed to how their child was feeling.

Parent Survey: Children's emotional experiences in local GP surgery environments

YOUR GP SURGERY: MEDICAL INSTRUMENTS

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Think about the child you have selected and any visits to a GP surgery when they have seen a healthcare professional for a routine check-up, a vaccine, blood test, illness diagnosis, receiving treatment, or anything else.

***8. Please state how much you agree or disagree with the following statements relating to the medical instruments used at the GP Surgery. For example: items such as a stethoscope, syringes, blood pressure monitors, aural thermometers, etc. Please indicate your answer by ticking the relevant circle.**

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
In general, the healthcare professional made an effort to make my child feel relaxed when the use of a medical instrument was necessary.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I consider the aesthetic appearance of the medical instruments contributed to my child's emotional experience whilst there.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, the medical instruments made my child feel amused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 3.2. Exert from medical equipment section of questionnaire showing the additional questions asked

The final section of the questionnaire began by asking the parents to rank in order of importance what they thought contributed towards their child's emotional experience (Figure 3.3) between:

- The waiting room environment
- The treatment room environment
- Medical equipment
- The Staff

The remainder of this section contained three, optional, open-ended questions allowing respondents to elaborate on any particular positive or negative experiences that they wished to give detail about in their own words (Figure 3.5). This was to give the parents the opportunity to express their thoughts and feelings towards their children's experiences

whether it be positive or negative, or if they felt they had something relevant to comment on that wasn't touched on in the previous sections of the questionnaire.

Parent Survey: Children's emotional experiences in local GP surgery environments

OTHER COMMENTS

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***9. Please rank in order of importance regarding what you think contributes towards your child's emotional experience at a GP surgery.**

1 = most important, 4 = least important

	1	2	3	4
Waiting room	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Treatment room	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Medical Instruments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Staff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

10. Please can you write about a particular positive experience that you remember your child having while at your local GP surgery and why you think this was.

11. Please can you write about a particular negative experience that you remember your child having while at your local GP surgery and why you think this was.

12. Please add further comments you think relevant regarding visits with your child/ren to your local GP surgery.

Figure 3.3. Importance rankings and optional, open-ended questions asked in the final section of the questionnaire

The survey was created using SurveyMonkey, a website enabling users to create web-based surveys. A pilot survey was conducted in May 2011 where the questions were tested with a small sample of parents (n = 10) to see if, firstly, the parents were able to complete the survey without any difficulties, and to see if the questions asked elicited information to answer the research questions and suitable for analysis. Only a few minor tweaks to the wording of some questions were required.

3.3.1. Sampling Strategy

The target sample of stakeholders for this questionnaire survey was parents and guardians with children who were 18 years old or younger. It was distributed mainly online, with a paper based survey available when it was deemed more convenient. It was distributed firstly

through parenting websites such as Mumsnet and UK Parent Lounge in late May 2012. It was also handed out to a small number of parents at a local primary school in Scarborough, North Yorkshire, and was passed on to all known contacts of the investigator such as Loughborough University staff, friends and family. The sampling techniques used were convenience, purposive and snowballing sampling. Initially, the sampling involved selecting the most convenient persons to act as respondents (convenience) that fell in to the target population (purposive). Once these persons had participated, they were used as informants to identify other members of the required population, who are themselves then used as informants, and so on (snowballing). As the survey was for a set period (May-December 2011) no specific sample size was established but the survey was anticipating for a sample size of 250-300 respondents.

3.3.2. Survey Analysis

The first four questions provide nominal level data (gender, age group, frequency of visits per year and reasons they visit their primary care practice). This data was used for comparison between groups analysis. The last three questions that are open-ended provided qualitative data and were analysed using thematic analysis.

Ordinal data were gathered from the closed-ended questions on the waiting room, treatment room and medical equipment. Bar charts were created to help visualise the number of responses for each of the five likert scale responses for the twelve emotions. Response percentage tables were also calculated, as well as tests of significance (chi-squared) for between subject differences (gender and age). Statistical tests were not performed on the overall data (all subjects) as, after seeking advice from a Loughborough University statistician and there being no similar data set available to use as a comparison, there would be no benefit from doing so.

For the last part of the first section and the subsequent three sections, the response percentages of both 'strongly agree' and 'agree' were grouped together to form an overall 'agree' response, and the 'strongly disagree' and 'disagree' response percentages were grouped also to form an overall 'disagree' response. It was decided that the overall aim of these sections of the questionnaire was to gather information on whether a child simply *did* or *did not* experience the emotions reported in the questionnaire and whether the parent agreed or disagreed, regardless of intensity.

3.3.3. Ethical Approval

Ethical approval for the survey was sought by completing Loughborough University's Ethical Clearance Checklist which was approved by Loughborough University's Advisory Committee.

3.4. Results

This section details the results of the parent survey.

Two hundred and forty eight replies were received, with 228 fully completing the survey. The first section of the results describes the demographics of the respondents. The second section reports the analysis of the waiting room environment, the third section the treatment room environment and the fourth section the medical equipment. The last section presents the analysis of the priority ranking and qualitative data. Within each section of the analysis, the results are also presented by gender and age group. Data in the tables and figures are expressed as percentages, with the highest response highlighted in blue (where applicable).

3.4.1. Demographics

Tables 3.3 – 3.6 show the demographics of the children. There was an almost even split between parents of male and female children (Table 3.3). This helps the validity of the results with respect response bias. Male and female children could have very different experiences to each other and if one gender had been more prevalent in the survey than the other then the results could have been biased.

Table 3.3. Percentage breakdown of responses by gender

	Percentage of responses
Male	48.2% (n=110)
Female	51.8% (n=118)

Throughout the survey the age group demographics were monitored to try to achieve an approximate balance between the age groups (Table 3.4). Parents of children within certain age groups were, at times, targeted to balance out the age group numbers to minimise age bias. There was a 13.6% difference between the highest (0-4 year olds) and lowest (15-18 year olds) age group response.

Table 3.4. Percentage breakdown of total responses by child age

	Percentage of responses
0-4 years	32.9% (n=75)
5-9 years	26.3% (n=60)
10-14 years	21.5% (n=49)
15-18 years	19.3% (n=44)

It was found that children tended to visit their primary care practice 0-2 times a year (Table 3.5). Females did however average more at 3-5 visits a year and 0-4 year olds averaged 3-5 visits a year also.

Table 3.5. Percentage breakdown of approximate number of visits per year by gender and age group

	Approximately how many times a year does your child currently visit your primary care practice				Total
	0-2	3-5	6-9	10+	
Male	45.5% (n=50)	35.5% (n=39)	15.5% (n=17)	3.6% (n=4)	100% (n=110)
Female	39.8% (n=47)	43.2% (n=51)	14.4% (n=17)	2.5% (n=3)	100% (n=118)
0-4 years	18.7% (n=15)	48.0% (n=36)	28.0% (n=21)	5.3% (n=4)	100% (n=75)
5-9 years	48.3% (n=29)	40.0% (n=24)	10.0% (n=6)	1.7% (n=1)	100% (n=60)
10-14 years	53.1% (n=26)	34.7% (n=17)	10.2% (n=5)	2.0% (n=1)	100% (n=49)
15-18 years	63.6% (n=28)	29.5% (n=13)	4.5% (n=2)	2.3% (n=1)	100% (n=44)

Parents were also asked to state why the main reasons their child requires visits to their primary care practice. The answers were split into three categories:

- Routine/minor procedures (e.g. blood tests, vaccines, check-ups)
- Regular but non-serious treatment (e.g. physiotherapy)
- More serious treatment (e.g. cancer, cystic fibrosis)

Table 3.6 shows that both genders and all age groups mainly required visits to their primary care practice because of routine and/or minor procedures. This was to be expected as routine and minor procedures include appointments for general check-ups, blood tests, minor illnesses, etc., and anything more serious tends to be referred to at a hospital. Only a very small percentage required visits for more serious treatment.

Table 3.6. Percentage breakdown of reasons for primary care practice visits by gender and age group

	Main reasons for primary care practice visits			Total
	Routine/minor procedures	Regular but non-serious treatment	More serious treatment	
Male	84.5% (n=93)	14.5% (n=16)	0.9% (n=1)	100% (n=110)
Female	86.4% (n=102)	11.9% (n=14)	1.7% (n=2)	100% (n=118)
0-4 years	84.0% (n=63)	14.7% (n=11)	1.3% (n=1)	100% (n=75)
5-9 years	88.3% (n=53)	10.0% (n=6)	1.7% (n=1)	100% (n=60)
10-14 years	83.7% (n=41)	16.3% (n=8)	0.0% (n=0)	100% (n=49)
15-18 years	86.4% (n=38)	11.4% (n=5)	2.3% (n=1)	100% (n=44)

3.4.2. General Questions

The final part of this section of the questionnaire asked three general questions about the respondent's primary care practice (Table 3.7).

The table below and all tables presented in this section (3.4) show the percentage and number (n) of the 228 respondents that either *agreed* or *disagreed* to the statements. Each row will therefore not show to total 100% (n=228) due to the percentage of respondents who answered 'neither agree or disagree'.

Table 3.7. Percentage responses to general questions

Statement	Agree	Disagree
I consider my GP surgery to be modern and not dated	59.6% (n=136)	18.9% (n=43)
In general, my child doesn't mind visiting the GP surgery	81.1% (n=185)	10.5% (n=24)
In general, the surgery staff made an effort to make my child feel relaxed on arrival	42.1% (n=96)	18.9% (n=43)

- 59.6% agreed that they considered their primary care practice to be modern and not dated (Figure 3.4)
- 81.1% agreed that their child does not mind visiting their primary care practice (Figure 3.5)
- 42.1% agreed that they felt the staff at their primary care practice made an effort with their child while visiting (Figure 3.6)

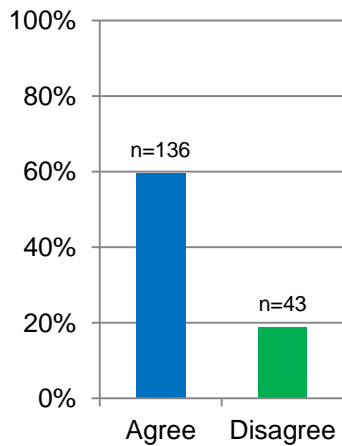


Figure 3.4. Considered modern not dated

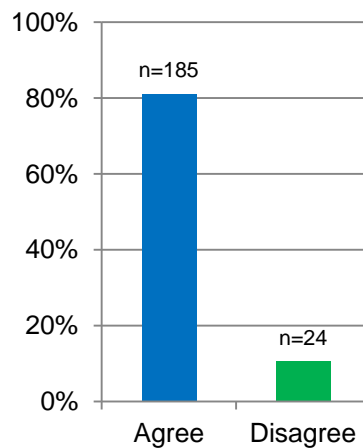


Figure 3.5. Child does not mind visiting

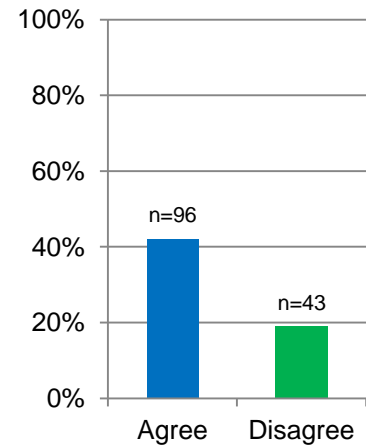


Figure 3.6. Staff make an effort

3.4.2.1. Gender

There were no significant differences found between gender for these statements (Table 3.8).

Table 3.8. Results of chi-squared test for significance between gender

Statement	Chi-squared test of significance ($p < 0.05$)
I consider my GP surgery to be modern and not dated	$p = .306$
In general, my child doesn't mind visiting the GP surgery	$p = .294$
In general, the surgery staff made an effort to make my child feel relaxed on arrival	$p = .938$

3.4.2.2. Age

There were no significant differences found between age groups for these statements (Table 3.9).

Table 3.9. Results of chi-squared test for significance between age groups

Statement	Chi-squared test of significance ($p < 0.05$)
I consider my GP surgery to be modern and not dated	$p = .681$
In general, my child doesn't mind visiting the GP surgery	$p = .941$
In general, the surgery staff made an effort to make my child feel relaxed on arrival	$p = .814$

3.4.2.3. Summary

The majority response from parents agreed to consider their primary care practice as modern and not dated, and that their child generally did not mind visiting their practice. Although 42.1% also agreed to staff making an effort with their child, further analysis showed that 39% also answered 'neither agree or disagree'. There were no significant differences found between gender or age.

3.4.3. Waiting Room Environment

This section looked at the child's emotional experience with the waiting room environment. The results in Table 3.10 show the results of all respondents.

Table 3.10. Response percentage for all respondents

My child felt:	Agree	Disagree
Amused	25.4% (n=58)	44.7% (n=102)
Anxious	28.9% (n=66)	46.9% (n=108)
Bored	54.8% (n=125)	23.2% (n=53)
Courageous	10.1% (n=23)	30.3% (n=69)
Doubtful	18.9% (n=43)	35.5% (n=81)
Excited	10.5% (n=24)	57.5% (n=131)
Helpless	4.8% (n=11)	54.8% (n=126)
Interested	38.2% (n=87)	30.7% (n=70)
Relaxed	46.1% (n=105)	24.6% (n=56)
Shocked	3.5% (n=8)	74.1% (n=169)
Tense	18.0% (n=41)	36.0% (n=83)
Trustful	41.7% (n=95)	11.8% (n=27)

Parents agreed that their child felt:

- Bored (54.8%)
- Interested (38.2%)
- Relaxed (46.1%)
- Trustful (41.7%)

Parents agreeing to their child feeling the negative emotion 'bored' (Figure 3.7) will be closely examined as the aim is to lessen the prevalence of negative emotions.

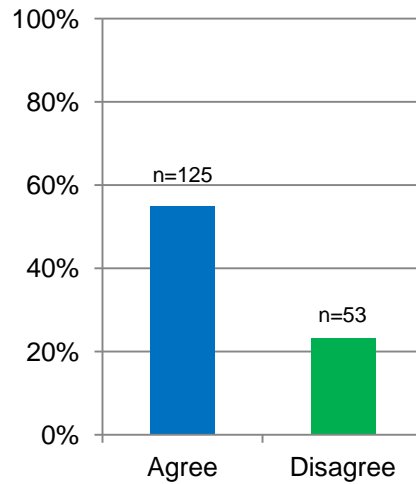


Figure 3.7. Bored in the waiting room

Parents disagreed that their child felt:

- Amused (44.7%)
- Anxious (46.9%)
- Courageous (30.3%)
- Doubtful (35.5%)
- Excited (57.5%)
- Helpless (54.8%)
- Shocked (74.1%)
- Tense (36.0%)

Parents disagreeing to their child feeling the positive emotions ‘amused’ (Figure 3.8), ‘courageous’ (Figure 3.9) and ‘excited’ (Figure 3.10) will be closely examined as the aim is to promote positive emotions.

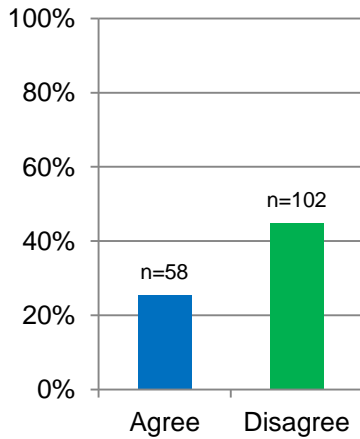


Figure 3.8. Amused in the waiting room

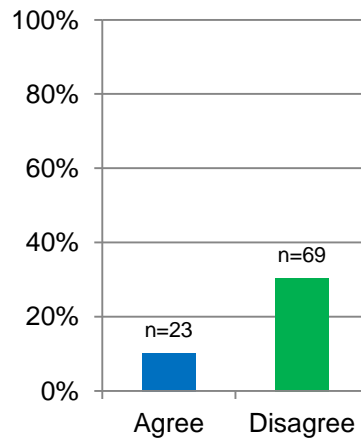


Figure 3.9. Courageous in the waiting room

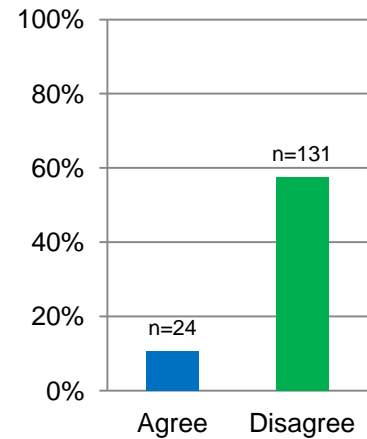


Figure 3.10. Excited in the waiting room

3.4.3.1. Gender

The response percentages according to gender for the emotions felt in the waiting room are shown in Table 3.11. There were no significant differences found between gender and emotions felt in the waiting room environment.

Table 3.11. Response percentages by gender

My child felt:	Male		Female		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	
Amused	36.3% (n=29)	63.7% (n=51)	36.3% (n=29)	63.7% (n=51)	$p = .718$
Anxious	35.7% (n=30)	64.3% (n=54)	35.7% (n=30)	60.0% (n=54)	$p = .803$
Bored	77.5% (n=69)	22.5% (n=20)	77.5% (n=69)	37.1% (n=33)	$p = .062$
Courageous	23.1% (n=9)	76.9% (n=30)	23.1% (n=9)	73.9% (n=39)	$p = .325$
Doubtful	32.8% (n=19)	67.2% (n=39)	32.8% (n=19)	63.6% (n=42)	$p = .814$
Excited	13.3% (n=10)	86.7% (n=65)	13.3% (n=10)	82.5% (n=66)	$p = .772$
Helpless	7.1% (n=5)	92.9% (n=65)	7.1% (n=5)	91.0% (n=61)	$p = .616$
Interested	52.0% (n=39)	48.0% (n=36)	52.0% (n=39)	41.5% (n=34)	$p = .697$
Relaxed	66.2% (n=49)	33.8% (n=25)	66.2% (n=49)	35.6% (n=31)	$p = .608$
Shocked	4.5% (n=4)	95.5% (n=84)	4.5% (n=4)	95.5% (n=85)	$p = .709$
Tense	30.0% (n=18)	70.0% (n=42)	30.0% (n=18)	64.1% (n=41)	$p = .735$
Trustful	75.4% (n=46)	24.6% (n=15)	75.4% (n=46)	19.7% (n=12)	$p = .687$

3.4.3.2. Age

The response percentages according to age group for the emotions felt in the waiting room are shown in Tables 3.12.

Table 3.12. Response percentages by age group

My child felt:	0-4 years		5-9 years		10-14 years		15-18 years		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	
Amused	56.1% (n=32)	43.9% (n=25)	31.7% (n=13)	68.3% (n=28)	25.8% (n=8)	74.2% (n=23)	15.6% (n=5)	84.4% (n=27)	$p = .003$
Anxious	27.6% (n=16)	72.4% (n=42)	34.8% (n=16)	65.2% (n=30)	45.2% (n=19)	54.8% (n=23)	53.6% (n=15)	46.4% (n=13)	$p = .056$
Bored	58.9% (n=33)	41.1% (n=23)	58.7% (n=27)	41.3% (n=19)	78.4% (n=29)	21.6% (n=8)	92.3% (n=36)	7.7% (n=3)	$p = .002$
Courageous	18.5% (n=5)	81.5% (n=22)	30.8% (n=8)	69.2% (n=18)	14.3% (n=3)	85.7% (n=18)	38.9% (n=7)	61.1% (n=11)	$p = .515$
Doubtful	35.0% (n=14)	65.0% (n=26)	35.3% (n=12)	64.7% (n=22)	44.0% (n=11)	56.0% (n=14)	24.0% (n=6)	76.0% (n=19)	$p = .844$
Excited	31.8% (n=14)	68.2% (n=30)	17.5% (n=7)	82.5% (n=33)	2.6% (n=1)	97.4% (n=38)	6.3% (n=2)	93.8% (n=30)	$p = .001$
Helpless	10.0% (n=4)	90.0% (n=36)	11.4% (n=4)	88.6% (n=31)	3.0% (n=1)	97% (n=32)	6.9% (n=2)	93.1% (n=27)	$p = .482$
Interested	71.2% (n=42)	28.8% (n=17)	43.6% (n=17)	56.4% (n=22)	46.4% (n=13)	53.6% (n=15)	48.4% (n=15)	51.6% (n=16)	$p = .008$
Relaxed	69.0% (n=40)	31.0% (n=18)	69.6% (n=32)	30.4% (n=14)	57.1% (n=16)	42.9% (n=12)	58.6% (n=17)	41.4% (n=12)	$p = .126$
Shocked	8.3% (n=5)	91.7% (n=55)	2.3% (n=1)	97.7% (n=43)	0% (n=0)	100% (n=40)	6.1% (n=2)	93.9% (n=31)	$p = .396$
Tense	22.6% (n=7)	77.4% (n=24)	24.2% (n=8)	75.8% (n=25)	38.9% (n=14)	61.1% (n=22)	50.0% (n=12)	50.0% (n=12)	$p = .006$
Trustful	70.7% (n=29)	29.3% (n=12)	84.8% (n=28)	15.2% (n=5)	76.9% (n=20)	23.1% (n=6)	81.8% (n=18)	18.2% (n=4)	$p = .844$

There were five significant differences found between the responses of parents with children in the four age groups for the emotions. There was evidence of a significant difference between age and response given feeling amused in the waiting room: $X^2(6, N = 228) = 20.129, p = .003$. Figure 3.11 shows that parents 0-4 year olds had the highest percentage that agreed (56.1%) and that parents of 15-18 year olds had the highest percentage to disagree (84.4%), showing that with increasing age there was a decrease in amusement.

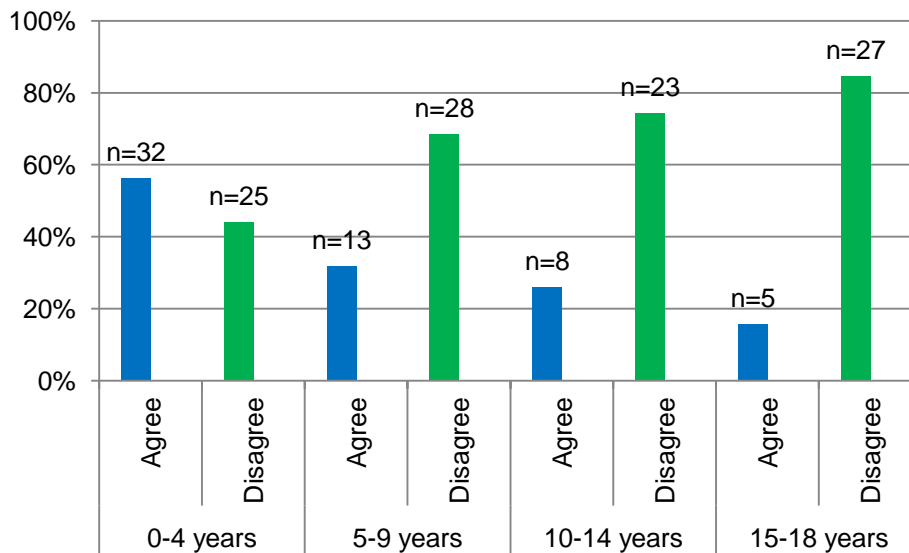


Figure 3.11. Amused in the waiting room by age group

There was evidence of a significant difference between age and response given feeling bored in the waiting room: $X^2(6, N = 228) = 21.238, p = .002$. Figure 3.12 shows that all parents agreed with parents of 10-14 year olds agreeing more than the younger two age groups (78.4%) and 15-18 year olds agreeing the most (92.3%). This shows that with an increase in age there was an increase in boredom.

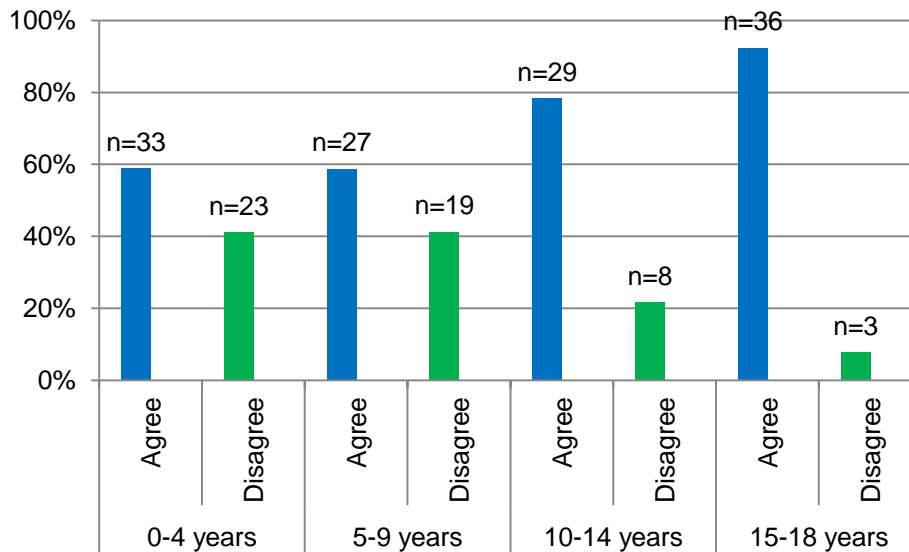


Figure 3.12. Bored in the waiting room by age group

There was evidence of a significant difference between age and response given feeling excited in the waiting room: $\chi^2 (6, N = 228) = 22.445, p = .001$. Figure 3.13 shows that parents of 0-4 year olds agreed the most (31.8%) and parents of 10-14 year olds disagreed the most (97.4%). This also suggests that with an increase in age there was a decrease in excitement.

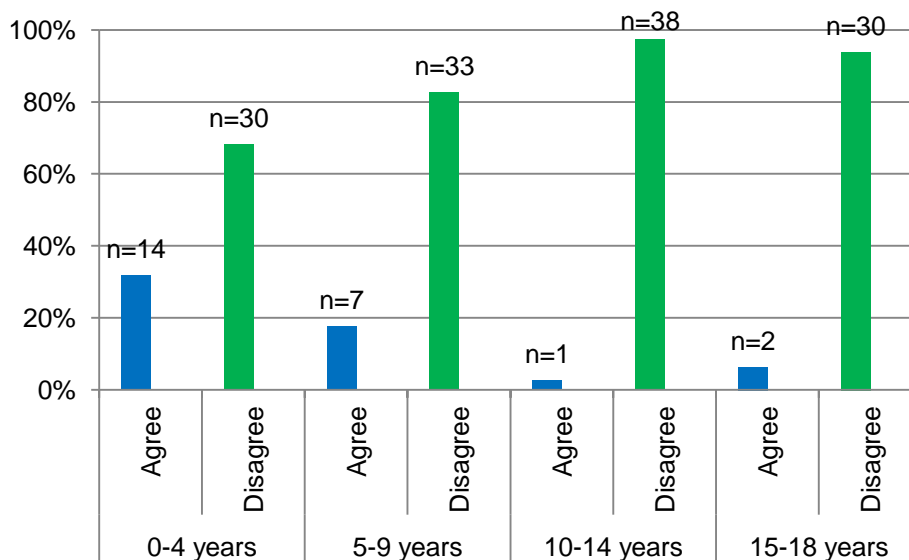


Figure 3.13. Excited in the waiting room by age group

There was evidence of a significant difference between age and response given feeling interested in the waiting room: $\chi^2 (6, N = 228) = 17.233, p = .008$. Figure 3.14 shows that

only parents of 0-4 year olds agreed with their child feeling interested (71.2%). The remaining age groups all had a higher percentage of 'disagree' than 'agree'.

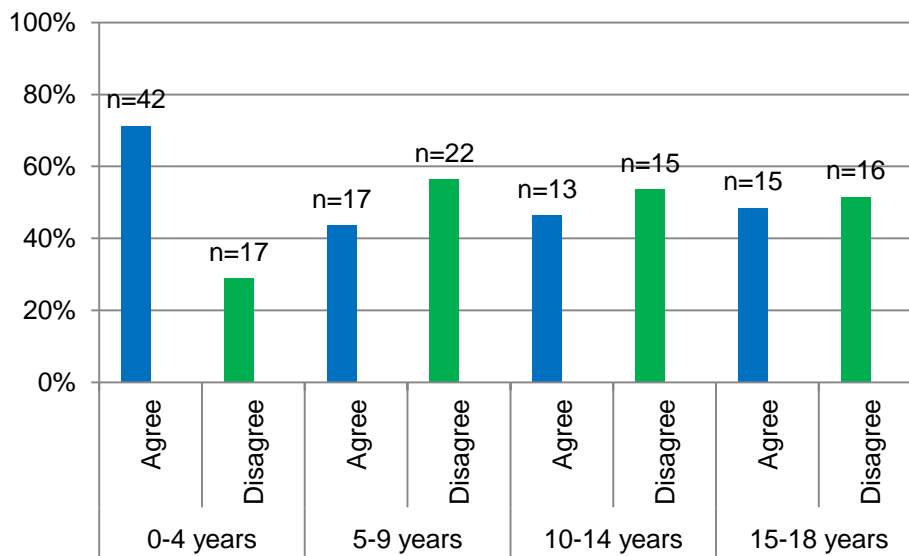


Figure 3.14. Interested in the waiting room by age group

There was evidence of a significant difference between age and response given feeling tense in the waiting room: $X^2(6, N = 228) = 18.274, p = .006$. Figure 3.15 shows that parents of the younger two age groups disagreed more with this statement than the older two age groups.

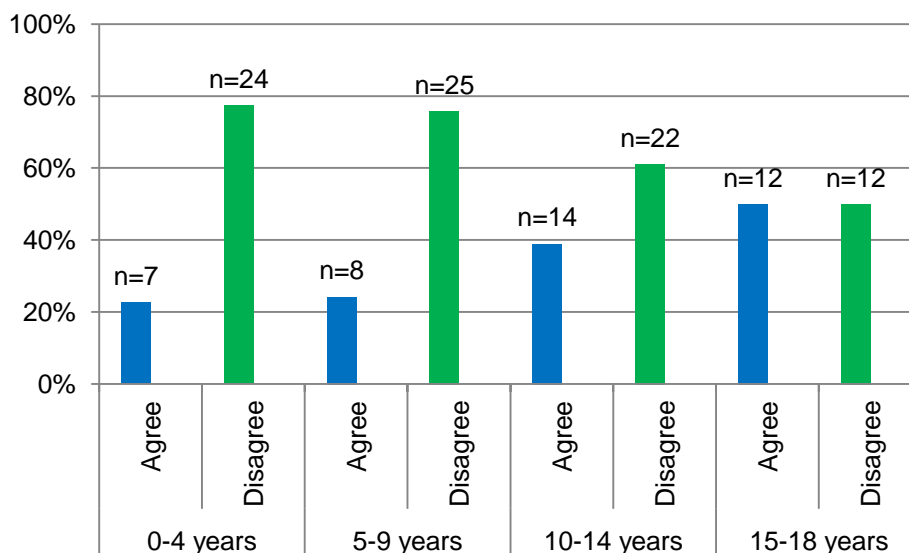


Figure 3.15. Tense in the waiting room by age group

3.4.3.3. Summary

In summary the results show for all respondents that:

- Boredom was experienced in the waiting room.
- Amusement, courage and excitement were not experienced in the waiting room.

Regarding gender, there were no differences found.

Regarding age there were five differences found:

- As age increased the amount of amusement experienced decreased with 0-4 year olds being the only age group to experience amusement in the waiting room.
- As age increased the amount of boredom experienced increased in the waiting room.
- No age groups experienced excitement in the waiting room, with a decrease in excitement as age increased.
- Only 0-4 year olds experienced interest in the waiting room.
- As age increased, tension in the waiting room decreased.

3.4.4. Treatment Room Environment

This section looked at the child's emotional experience with the treatment room environment.

The results in Table 3.13 show the results of all respondents.

Table 3.13. Response percentage for all respondents

My child felt:	Agree	Disagree
Amused	15.8% (n=36)	50.4% (n=115)
Anxious	35.1% (n=80)	37.3% (n=85)
Bored	18.9% (n=43)	47.8% (n=109)
Courageous	21.9% (n=50)	34.2% (n=78)
Doubtful	25.9% (n=59)	36.0% (n=82)
Excited	9.6% (n=22)	56.1% (n=128)
Helpless	8.3% (n=19)	57.5% (n=131)
Interested	52.6% (n=120)	20.2% (n=46)
Relaxed	38.6% (n=88)	27.6% (n=63)
Shocked	4.8% (n=11)	70.6% (n=161)
Tense	32.0% (n=73)	39.0% (n=89)
Trustful	55.3% (n=126)	12.3% (n=28)

Parents agreed that their child felt:

- Interested (52.6%)
- Relaxed (38.6%)
- Trustful (55.3%)

Parents disagreed that their child felt:

- Amused (50.4%)
- Anxious (37.3%)
- Bored (47.8%)
- Courageous (34.2%)
- Doubtful (36.0%)
- Excited (56.1%)
- Helpless (57.5%)
- Shocked (70.6%)
- Tense (39.0%)

Parents disagreeing to their child feeling the positive emotions 'amused' (Figure 3.16), 'courageous' (Figure 3.17) and 'excited' (Figure 3.18) will be closely examined as the aim is to promote positive emotions.

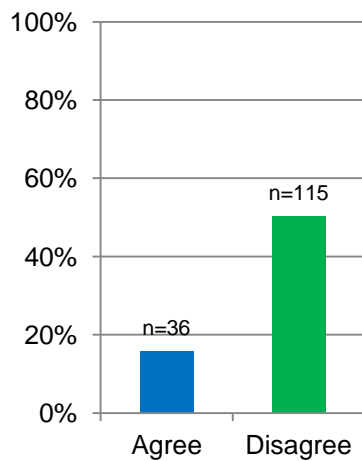


Figure 3.16. Amused in the treatment room

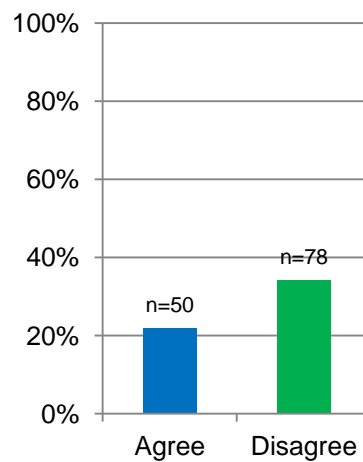


Figure 3.17. Courageous in the treatment room

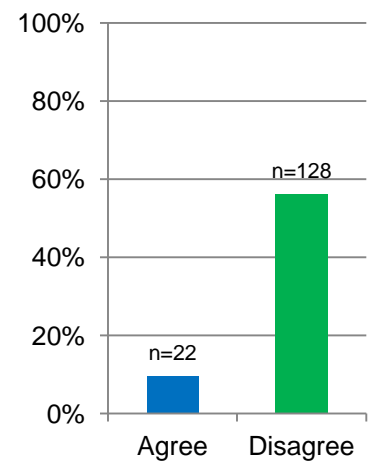


Figure 3.18. Excited in the treatment room

3.4.4.1. Gender

The response percentages according to gender for the emotions felt in the waiting room are shown in Table 3.14. There were no significant differences found between gender and emotions felt in the treatment room environment.

Table 3.14. Response percentages by gender

My child felt:	Male		Female		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	
Amused	14.5% (n=16)	50.9% (n=56)	16.9% (n=20)	50.0% (n=59)	$p = .880$
Anxious	30.9% (n=34)	37.3% (n=41)	39.0% (n=46)	37.3% (n=44)	$p = .300$
Bored	20.0% (n=22)	43.6% (n=48)	17.8% (n=21)	51.7% (n=61)	$p = .471$
Courageous	22.9% (n=25)	33.9% (n=37)	21.2% (n=25)	34.7% (n=41)	$p = .951$
Doubtful	25.5% (n=28)	32.7% (n=36)	26.3% (n=31)	39.0% (n=46)	$p = .501$
Excited	10.0% (n=11)	58.2% (n=64)	9.3% (n=11)	54.2% (n=64)	$p = .763$
Helpless	7.3% (n=8)	60.9% (n=67)	9.3% (n=11)	54.2% (n=64)	$p = .582$
Interested	53.6% (n=59)	22.7% (n=25)	51.7% (n=61)	17.8% (n=21)	$p = .424$
Relaxed	41.8% (n=46)	21.8% (n=24)	35.6% (n=42)	33.1% (n=39)	$p = .166$
Shocked	2.7% (n=3)	74.5% (n=82)	6.8% (n=8)	66.9% (n=79)	$p = .260$
Tense	28.2% (n=31)	40.0% (n=44)	35.6% (n=42)	38.1% (n=45)	$p = .442$
Trustful	56.4% (n=62)	11.8% (n=13)	54.2% (n=64)	12.7% (n=15)	$p = .946$

3.4.4.2. Age

The response percentages according to age group for the emotions felt in the waiting room are shown in Table 3.15.

There were six significant differences found between the responses of parents with children in the four age groups for the emotions. There was evidence of a significant difference between age and response given to feeling anxious in the treatment room: $X^2 (6, N = 228) = 24.159, p = .000$. Figure 3.19 shows that parents of the eldest age group agreed the most and disagreed the least and parents of 5-9 year olds disagreed the most and agreed the least.

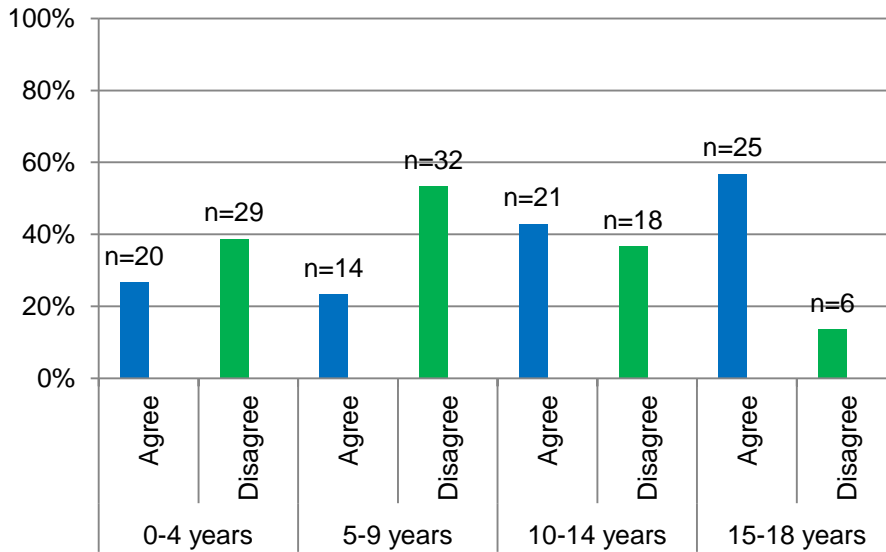


Figure 3.19. Anxious in the treatment room by age group

There was evidence of a significant difference between age and response given to feeling bored in the treatment room: $X^2 (6, N = 228) = 13.971, p = .030$. Figure 3.20 shows that parents of 10-14 year olds disagreed the most and the younger two groups had the highest percentage of parents that agreed.

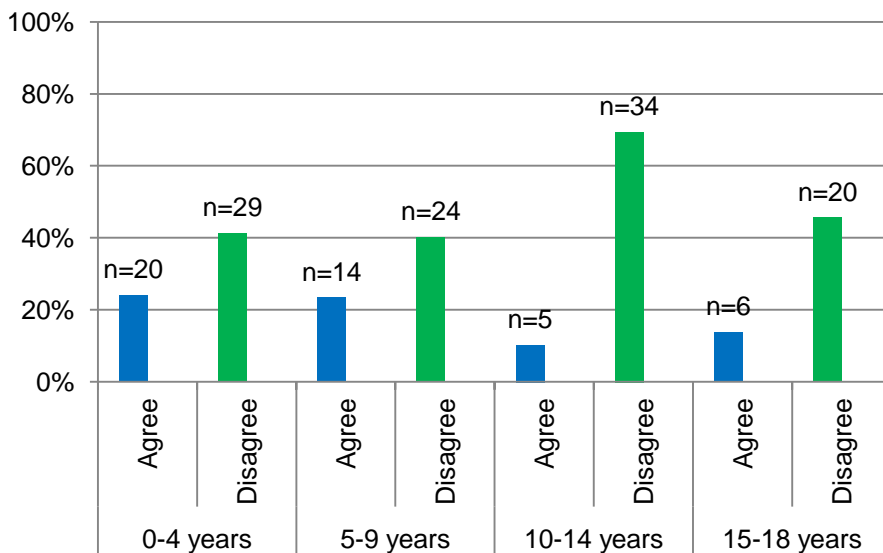


Figure 3.20. Bored in the treatment room by age group

Table 3.15. Response percentages by age group

My child felt:	0-4 years		5-9 years		10-14 years		15-18 years		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	
Amused	22.7% (n=17)	40.0% (n=30)	16.7% (n=10)	48.3% (n=29)	12.2% (n=6)	59.2% (n=29)	6.8% (n=3)	61.4% (n=27)	$p = .167$
Anxious	26.7% (n=20)	38.7% (n=29)	23.3% (n=14)	53.3% (n=32)	42.9% (n=21)	36.7% (n=18)	56.8% (n=25)	13.6% (n=6)	$p = .000$
Bored	24.0% (n=18)	41.3% (n=31)	23.3% (n=14)	40.0% (n=24)	10.2% (n=5)	69.4% (n=34)	13.6% (n=6)	45.5% (n=20)	$p = .030$
Courageous	13.5% (n=10)	39.2% (n=29)	18.3% (n=11)	30.0% (n=18)	20.4% (n=10)	40.8% (n=20)	43.2% (n=19)	25.0% (n=11)	$p = .009$
Doubtful	30.7% (n=23)	32.0% (n=24)	18.3% (n=12)	40.0% (n=24)	26.5% (n=13)	40.8% (n=20)	27.3% (n=12)	31.8% (n=14)	$p = .698$
Excited	12.0% (n=9)	44.0% (n=33)	13.3% (n=8)	50.0% (n=30)	8.2% (n=4)	75.5% (n=37)	2.3% (n=1)	63.6% (n=28)	$p = .010$
Helpless	8.0% (n=6)	50.7% (n=38)	8.3% (n=5)	53.3% (n=32)	6.1% (n=3)	75.5% (n=37)	11.4% (n=5)	54.5% (n=24)	$p = .152$
Interested	53.3% (n=40)	22.7% (n=17)	46.7% (n=28)	23.3% (n=14)	55.1% (n=27)	16.3% (n=8)	56.8% (n=25)	15.9% (n=7)	$p = .881$
Relaxed	38.7% (n=29)	24.0% (n=18)	50.0% (n=30)	23.3% (n=14)	28.6% (n=14)	34.7% (n=17)	34.1% (n=15)	31.8% (n=14)	$p = .344$
Shocked	10.7% (n=8)	62.7% (n=47)	0.0% (n=0)	68.3% (n=41)	2.0% (n=1)	81.6% (n=40)	4.5% (n=2)	75.0% (n=33)	$p = .033$
Tense	30.7% (n=23)	44.0% (n=33)	18.3% (n=11)	51.7% (n=31)	40.8% (n=20)	32.7% (n=16)	43.2% (n=19)	20.5% (n=9)	$p = .020$
Trustful	46.7% (n=35)	18.7% (n=14)	56.7% (n=34)	11.7% (n=7)	57.1% (n=28)	8.2% (n=4)	65.9% (n=29)	6.8% (n=3)	$p = .342$

There was evidence of a significant difference between age and response given to feeling courageous in the treatment room: $X^2(6, N = 228) = 17.144, p = .009$. Figure 3.21 shows that parents of 0-4 year olds had the lowest percentage that agreed and 15-18 year olds had the highest percentage of agreed responses.

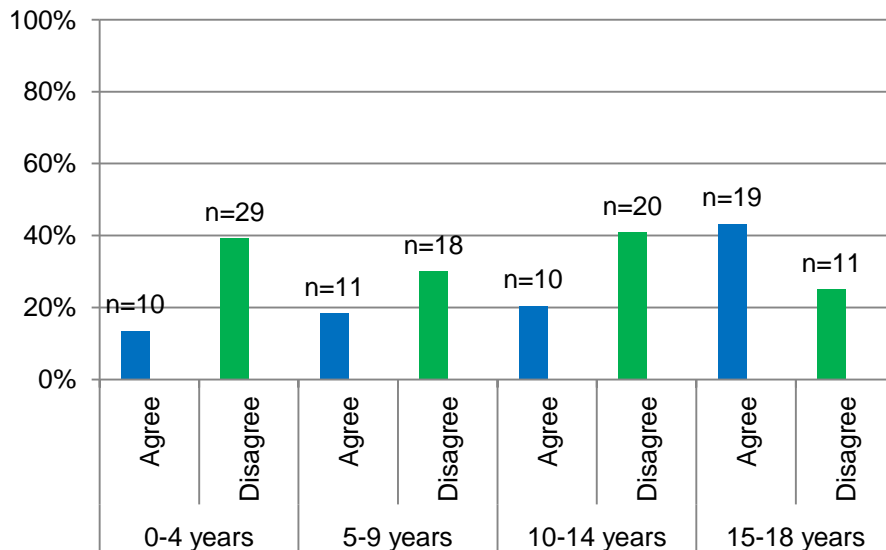


Figure 3.21. Courageous in the treatment room by age group

There was evidence of a significant difference between age and response given to feeling excited in the treatment room: $X^2(6, N = 228) = 16.742, p = .010$. Figure 3.22 shows that parents of the two eldest age groups had a higher percentage of disagree responses than the younger two age groups.

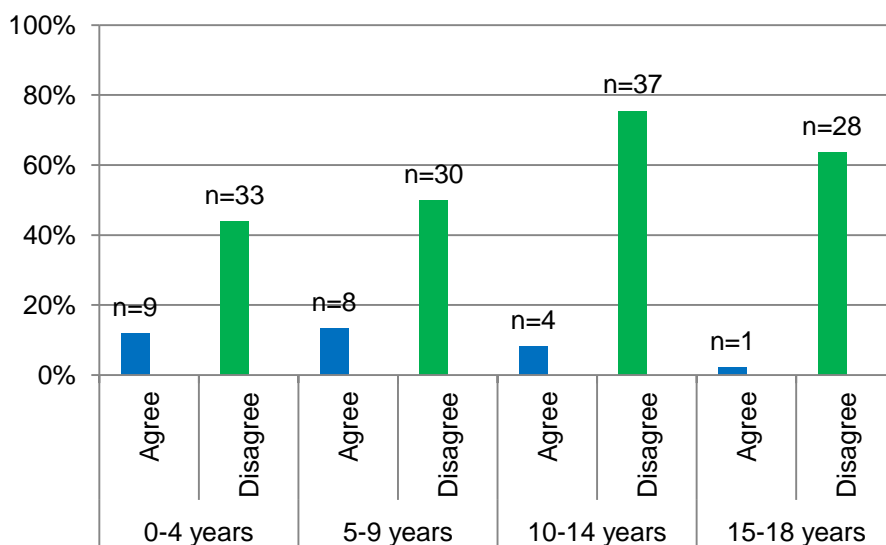


Figure 3.22. Excited in the treatment room by age group

There was evidence of a significant difference between age and response given to feeling shocked in the treatment room: $X^2(6, N = 228) = 13.696, p = .033$. Figure 3.23 shows that only parents of 10-14 year olds disagreed the most to this statements and parents of 0-4 year olds were the only parents to show a percentage that agreed.

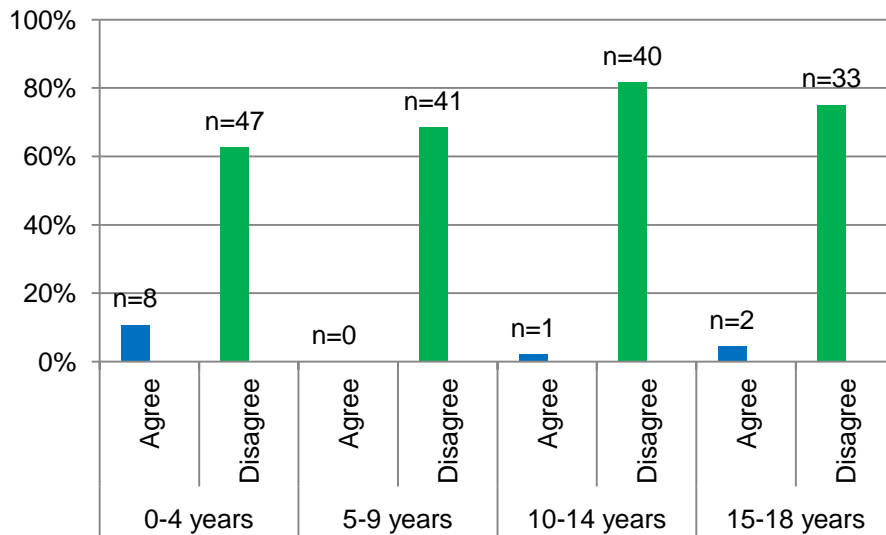


Figure 3.23. Shocked in the treatment room by age group

There was evidence of a significant difference between age and response given to feeling courageous in the treatment room: $X^2(6, N = 228) = 15.075, p = .020$. Figure 3.24 shows that parents of 5-9 year olds disagreed the most to this statement and parents of 15-18 year olds showed the highest percentage that agreed.

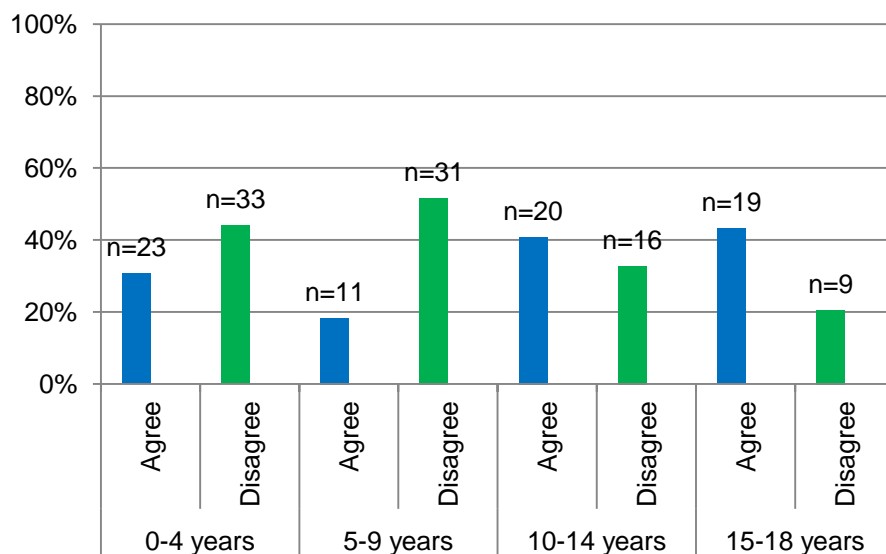


Figure 3.24. Tense in the treatment room by age group

3.4.4.3. Summary

In summary the results show for all respondents that:

- Amusement, courage and excitement were not experienced in the treatment room.

Regarding gender, there were no differences found.

Regarding age there were six differences found:

- With an increase in age there was an increase in anxiety in the treatment room.
- All age groups experienced boredom, 10-14 year olds being the most bored in the treatment room.
- Only 15-18 year olds felt courageous in the treatment room.
- No age groups experienced excitement but with increasing age there was a decrease in excitement with 10-14 year olds being the least excited in the treatment room.
- No age group experienced shock but with increasing age there was a decrease in shock with 10-14 year olds being the least shocked in the treatment room.
- With an increase in age there was an increase in tension in the treatment room.

3.4.5. Medical Equipment

This section looked at the child's emotional experience in response to medical equipment.

The results in Table 3.16 show the results of all respondents.

Table 3.16. Response percentage for all respondents

My child felt:	Agree	Disagree
Staff make effort	84.2% (n=192)	5.7% (n=13)
ME Appearance	36.0% (n=82)	19.3% (n=44)
Amused	22.4% (n=51)	48.7% (n=111)
Anxious	39.0% (n=89)	36.0% (n=82)
Bored	3.1% (n=7)	57.5% (n=131)
Courageous	13.6% (n=31)	43.0% (n=98)
Doubtful	23.2% (n=53)	35.5% (n=81)
Excited	14.9% (n=34)	53.9% (n=123)
Helpless	6.1% (n=14)	53.5% (n=122)
Interested	57.5% (n=131)	15.4% (n=35)
Relaxed	8.3% (n=19)	45.6% (n=104)
Shocked	6.1% (n=14)	62.7% (n=143)
Tense	40.8% (n=93)	30.7% (n=70)
Trustful	18.9% (n=43)	29.4% (n=67)

Parents agreed that their child felt:

- Staff made an effort (84.2%)
- The appearance of medical equipment contributed to their child's emotional experience (36.0%)
- Anxious (39.0%)
- Interested (57.5%)
- Tense (40.8%)

Parents agreeing to their child feeling the negative emotion 'anxious' (Figure 3.25) and 'tense' (Figure 3.26) will be closely examined as the aim is to lessen the prevalence of negative emotions

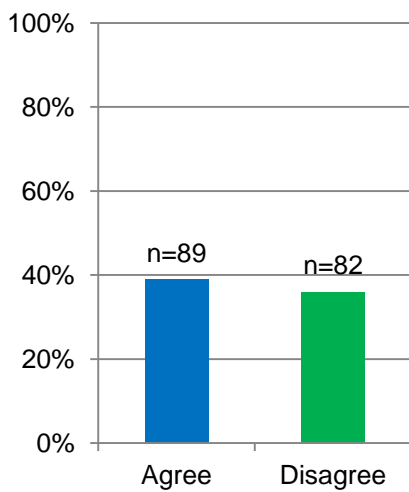


Figure 3.25. Anxious towards medical equipment

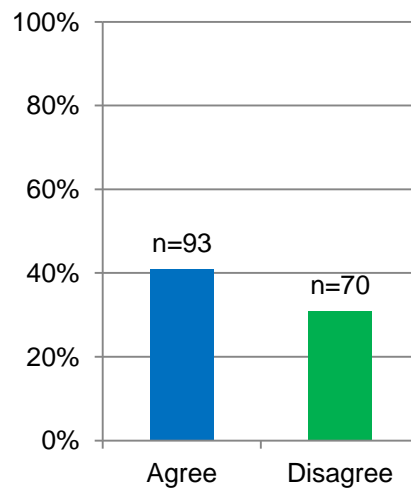


Figure 3.26. Tense towards medical equipment

Parents disagreed that their child felt:

- Amused (48.7%)
- Bored (57.5%)
- Courageous (43.0%)
- Doubtful (35.5%)
- Excited (53.9%)
- Helpless (53.5%)
- Relaxed (45.6%)
- Shocked (62.7%)

- Trustful (29.4%)

Parents disagreeing to their child feeling the positive emotions ‘amused’ (Figure 3.27), ‘courageous’ (Figure 3.28), ‘excited’ (Figure 3.29), ‘relaxed’ (Figure 3.30) and ‘trustful’ (Figure 3.31) will be closely examined as the aim is to promote positive emotions.

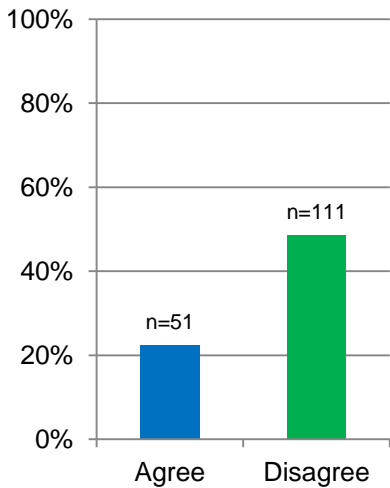


Figure 3.27. Amused toward medical equipment

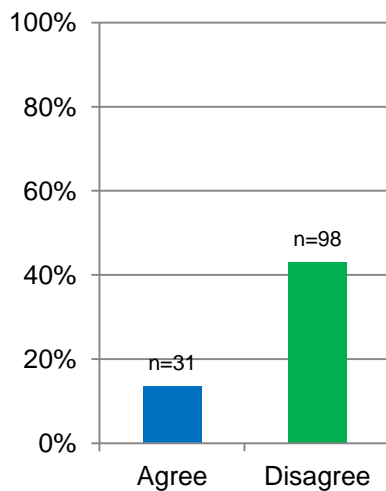


Figure 3.28. Courageous towards medical equipment

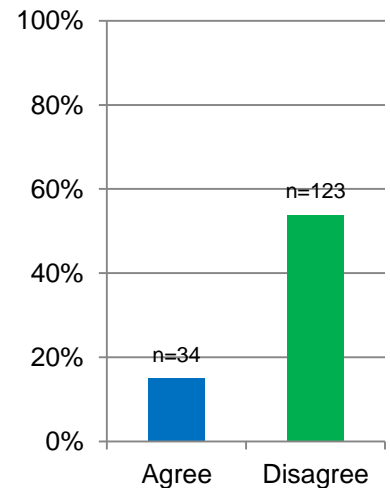


Figure 3.29. Excited towards medical equipment

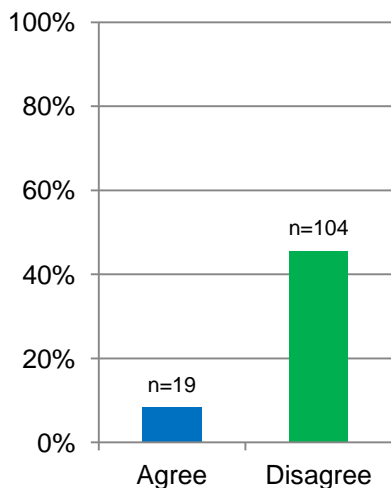


Figure 3.30. Relaxed towards medical equipment

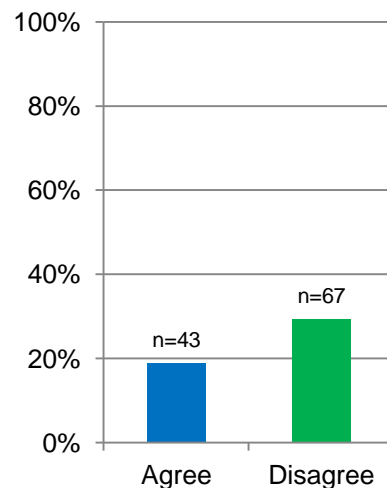


Figure 3.31. Trustful towards medical equipment

3.4.5.1. Gender

The response percentages according to gender for the emotions felt towards medical equipment are shown in Table 3.17. There were no significant differences found between gender and emotions felt towards medical equipment.

Table 3.17. Response percentages by gender

My child felt:	Male		Female		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	
Staff make effort	79.1% (n=87)	6.4% (n=7)	89.0% (n=105)	5.1% (n=6)	$p = .082$
ME Appearance	33.6% (n=37)	12.7% (n=14)	38.1% (n=45)	25.4% (n=30)	$p = .120$
Amused	22.7% (n=25)	44.5% (n=49)	22.0% (n=26)	52.5% (n=62)	$p = .405$
Anxious	35.5% (n=39)	33.6% (n=37)	42.4% (n=50)	38.1% (n=45)	$p = .136$
Bored	2.7% (n=3)	53.6% (n=59)	3.4% (n=4)	61.0% (n=72)	$p = .460$
Courageous	13.6% (n=15)	46.4% (n=51)	13.6% (n=16)	39.8% (n=47)	$p = .566$
Doubtful	25.5% (n=28)	34.5% (n=38)	21.2% (n=25)	36.4% (n=43)	$p = .748$
Excited	14.5% (n=16)	52.7% (n=58)	15.3% (n=18)	55.1% (n=65)	$p = .883$
Helpless	5.5% (n=6)	57.3% (n=63)	6.8% (n=8)	50.0% (n=59)	$p = .542$
Interested	60.0% (n=66)	16.4% (n=18)	55.1% (n=65)	14.4% (n=17)	$p = .504$
Relaxed	7.3% (n=8)	45.5% (n=50)	9.3% (n=11)	45.8% (n=54)	$p = .837$
Shocked	5.5% (n=6)	65.5% (n=72)	6.8% (n=8)	60.2% (n=71)	$p = .704$
Tense	40.9% (n=45)	28.2% (n=31)	40.7% (n=48)	33.1% (n=39)	$p = .647$
Trustful	16.4% (n=18)	30.0% (n=33)	21.2% (n=25)	28.8% (n=34)	$p = .646$

3.4.5.2. Age

The response percentages according to age group for the emotions felt towards medical equipment are shown in Table 3.18.

There were five significant differences found between the responses of parents with children in the four age groups for the emotions. There was evidence of a significant difference between age and response given to feeling anxious in the treatment room: $X^2(6, N = 228) = 18.535, p = .005$. Figure 3.32 shows that parents of 15-18 year olds were the only parents that had a higher percentage of agree responses than disagree responses.

Table 3.18. Response percentages by age group

My child felt:	0-4 years		5-9 years		10-14 years		15-18 years		Chi-squared ($p < 0.05$)
	Agree	Disagree	Agree	Disagree	Agree	Disagree	Agree	Disagree	
Staff effort	84.0% (n=63)	6.7% (n=5)	88.3% (n=53)	3.3% (n=2)	75.5% (n=37)	8.2% (n=4)	88.6% (n=39)	4.5% (n=2)	$p = .598$
ME Appearance	28.0% (n=21)	29.3% (n=22)	43.3% (n=26)	16.7% (n=10)	32.7% (n=16)	14.3% (n=7)	43.2% (n=19)	11.4% (n=5)	$p = .110$
Amused	34.7% (n=26)	40.0% (n=30)	20.0% (n=13)	46.7% (n=28)	14.3% (n=7)	55.1% (n=27)	13.6% (n=6)	59.1% (n=26)	$p = .072$
Anxious	32.0% (n=24)	42.7% (n=32)	35.0% (n=21)	50.0% (n=30)	42.9% (n=21)	28.6% (n=14)	52.3% (n=23)	13.6% (n=6)	$p = .005$
Bored	4.0% (n=3)	62.7% (n=47)	3.3% (n=2)	51.7% (n=31)	2.0% (n=1)	65.3% (n=32)	2.3% (n1)	47.7% (n=21)	$p = .490$
Courageous	6.7% (n=5)	45.3% (n=34)	13.3% (n=8)	43.3% (n=26)	10.2% (n=5)	53.1% (n=26)	29.5% (n=13)	27.3% (n=12)	$p = .014$
Doubtful	32.0% (n=24)	33.3% (n=25)	16.7% (n=10)	45.0% (n=27)	24.5% (n=12)	36.7% (n=18)	15.9% (n=7)	25.0% (n=11)	$p = .061$
Excited	22.7% (n=17)	44.0% (n=33)	16.7% (n=10)	48.3% (n=29)	10.2% (n=5)	69.4% (n=34)	4.5% (n=2)	61.4% (n=27)	$p = .033$
Helpless	4.0% (n=3)	57.3% (n=43)	6.7% (n=4)	53.3% (n=32)	6.1% (n=3)	57.1% (n=28)	9.1% (n=4)	43.2% (n=19)	$p = .781$
Interested	62.7% (n=47)	9.3% (n=7)	55.0% (n=33)	20.0% (n=12)	49.0% (n=24)	22.4% (n=11)	61.4% (n=27)	11.4% (n=5)	$p = .425$
Relaxed	8.0% (n=6)	44.0% (n=33)	13.3% (n=8)	43.3% (n=26)	2.0% (n=1)	57.1% (n=28)	9.1% (n=4)	38.6% (n=17)	$p = .321$
Shocked	10.7% (n=8)	60.0% (n=45)	3.3% (n=2)	66.7% (n=40)	4.1% (n=2)	71.4% (n=35)	4.5% (n=2)	52.3% (n=23)	$p = .221$
Tense	34.7% (n=26)	33.3% (n=25)	36.7% (n=22)	45.0% (n=27)	46.9% (n=23)	26.5% (n=13)	50.0% (n=22)	11.4% (n=5)	$p = .012$
Trustful	10.7% (n=8)	33.3% (n=25)	21.7% (n=13)	31.7% (n=19)	14.3% (n=7)	34.7% (n=17)	34.1% (n=15)	13.6% (n=6)	$p = .028$

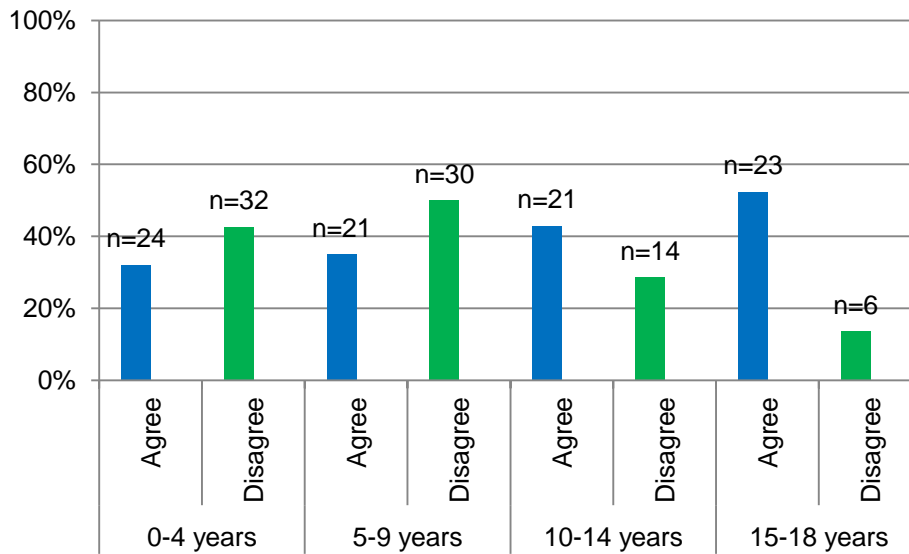


Figure 3.32. Anxious towards medical equipment by age

There was evidence of a significant difference between age and response given to feeling courageous towards medical equipment: $X^2 (6, N = 228) = 15.948, p = .014$. Figure 3.33 shows that parents of all ages with the exception of 15-18 year old age group had a much higher percentage disagreed compared to agreed.

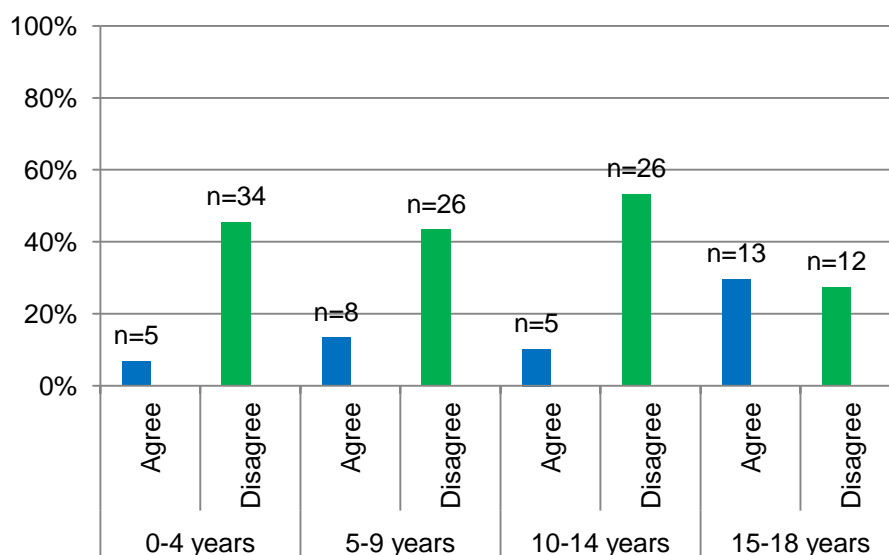


Figure 3.33. Courageous towards medical equipment by age

There was evidence of a significant difference between age and response given to feeling excited towards medical equipment: $X^2 (6, N = 228) = 13.726, p = .033$. Figure 3.34 shows

that parents of 10-18 year olds had the lowest agree responses percentage and a higher disagree response percentage.

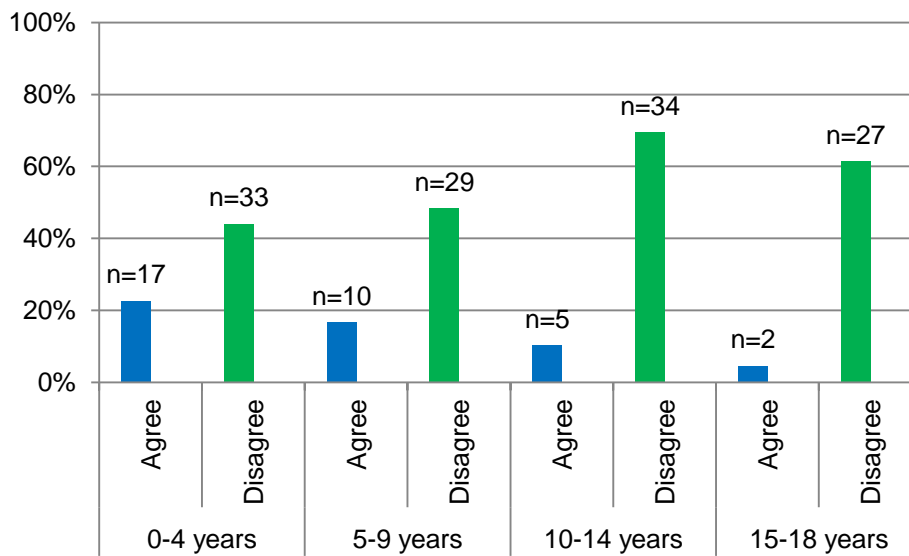


Figure 3.34. Excited towards medical equipment by age

There was evidence of a significant difference between age and response given to feeling tense towards medical equipment: $X^2 (6, N = 228) = 16.260, p = .012$. Figure 3.35 shows that parents of 10-18 year olds had a higher agree response percentage compared to their disagree response percentage.

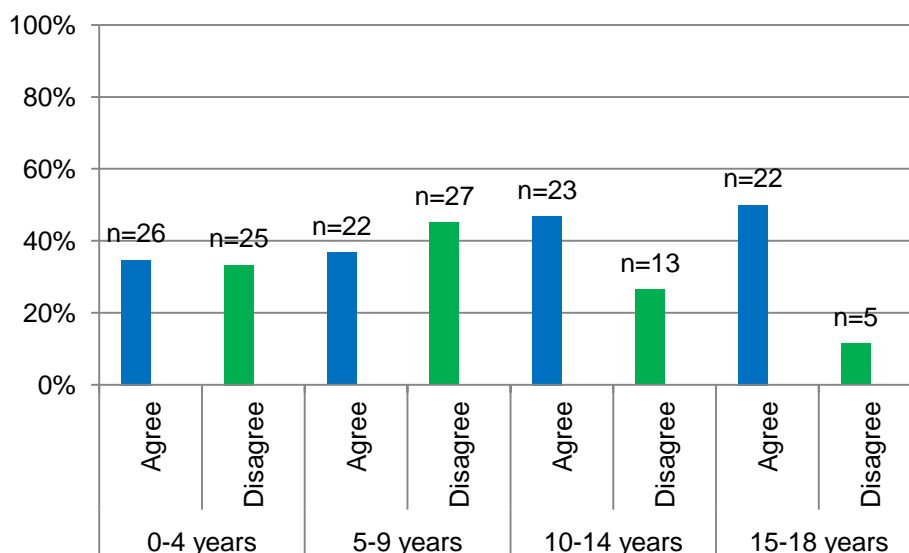


Figure 3.35. Tense towards medical equipment by age

There was evidence of a significant difference between age and response given to feeling trustful towards medical equipment: $\chi^2(6, N = 228) = 14.132, p = .028$. Figure 3.36 shows that parents of 15-18 year olds were the only parents to have a higher agree responses percentage compared to disagree. All other parents had a higher disagree response percentage.

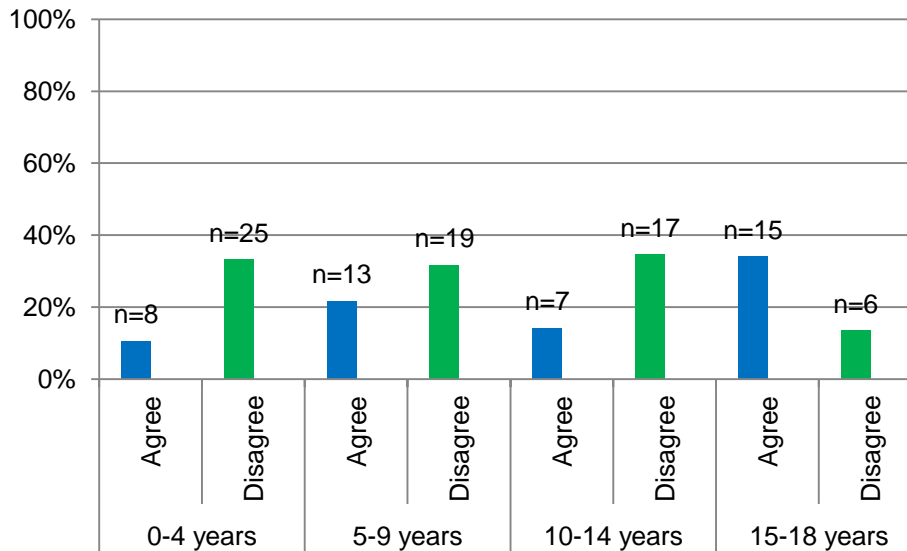


Figure 3.36. Trustful towards medical equipment by age

3.4.5.3. Summary

In summary the results show for all respondents that:

- Amusement, courage, excitement, relaxation and trust were not experienced toward medical equipment.

Regarding gender, there were no differences found.

Regarding age there were five differences found:

- As age increased the amount of anxiety experienced increased towards medical equipment. Ages 0-9 were not anxious but ages 10-18 were anxious.
- Ages 15-18 were the only age groups to feel courageous toward medical equipment.
- No age group experienced excitement but with increasing age there was a decrease in excitement towards medical equipment.
- As age increased the amount of tension felt increased, with 10-14 year olds feeling the most tense toward medical equipment.
- Ages 15-18 were the only age group to feel trustful toward medical equipment.

3.4.6. Importance Rankings

In the last section of the questionnaire, the parents were asked to rank different aspects of their primary care practice in order of importance regarding what they thought contributes to their child's emotional experience. The different aspects were the waiting room, treatment room, medical equipment and the staff (receptionists as well the healthcare professionals).

The four aspects were analysed on a scoring basis in the following way:

- The four levels of importance were representative of a score:
 - High importance was equivalent to a score of 4
 - The next a score of 3
 - The next a score of 2
 - Low importance a score of 1
- For each of the four aspects asked to be ranked, the number of respondents for each ranking was then multiplied by the score representative of that ranking. For example, if 10 respondents gave the waiting room a ranking of most important, this was then multiplied by the ranking's score of 4: $10 \times 4 = 20$.
- The total score of all rankings were then added to form a total score for that aspect.

The idea behind this analysis was that the aspect with highest total score was the aspect deemed the most important as it will have received more higher ranking responses.

Table 3.19 and Figure 3.37 show that, out of a total score of 912 (total number of participants $n = 228 \times$ highest ranking score 4), staff received the highest score (760), the treatment room 2nd highest score (541), with the waiting room closely after (531) and the medical equipment receiving the lowest score (445).

Table 3.19. Importance scores

	High Importance Score			Low Importance Score	Total Score
Waiting Room	132	225	108	66	531
Treatment Room	92	207	212	30	541
Medical Equip.	80	171	86	108	445
Staff	604	81	50	25	760

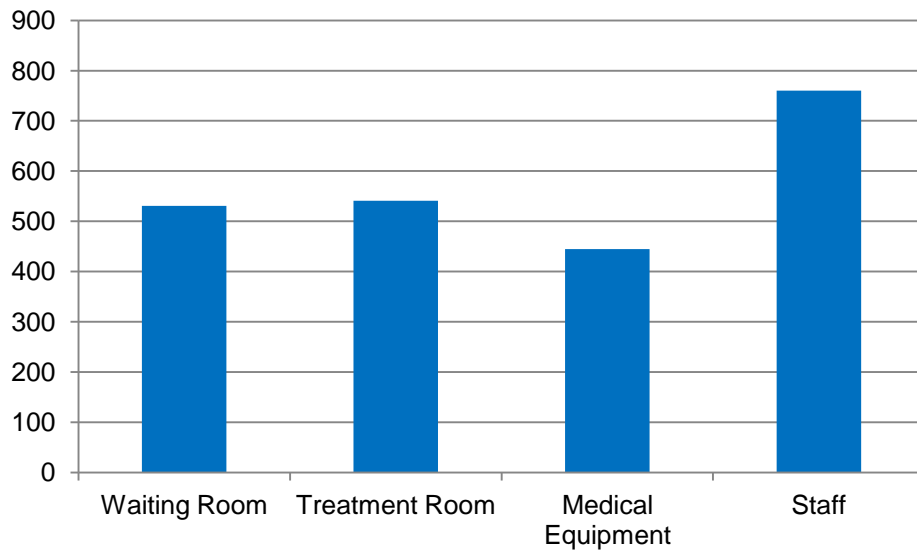


Figure 3.37. Importance ranking scores

3.4.6.1. Gender

When the scores were calculated according to gender (Table 3. 20), the same results were found for females; staff ranked as most important (393), treatment room second (274), waiting room third (249) and medical equipment receiving the lowest score (230). The scores for males, as can be seen in Figure 3.38, showed staff as scoring the highest and medical equipment the lowest, but that they considered the waiting room (277) as more important than the treatment room (252). However, these were not found to be significant differences (waiting room $p = .594$, treatment room $p = .466$).

Table 3.20. Importance scores by gender

	Male					Female					X ²
	High Imp. Score			Low Imp. Score	Total	High Imp. Score			Low Imp. Score	Total	
Waiting Room	51	120	50	56	277	48	105	58	38	249	.594
Treatment Room	32	99	104	17	252	45	108	108	13	274	.466
Medical Equipment	44	78	60	53	235	36	46	46	55	230	.895
Staff	296	33	26	12	367	308	24	24	13	393	.853

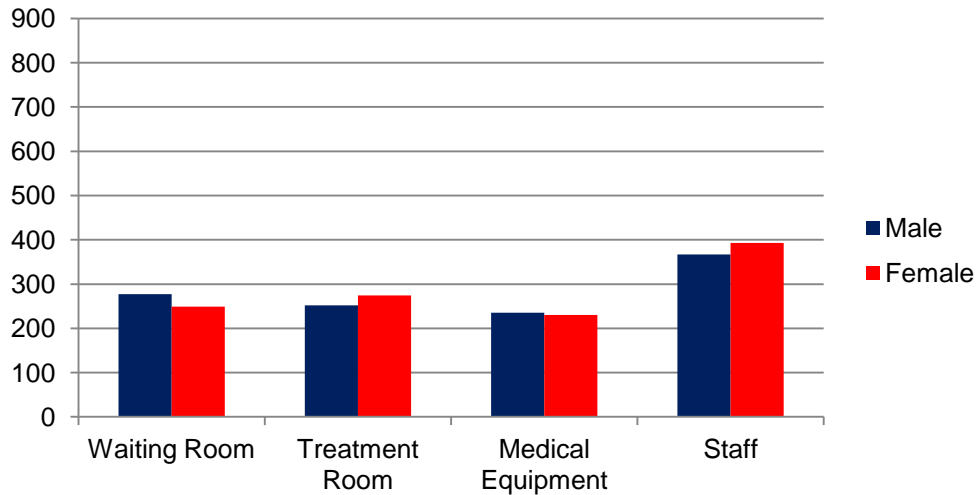


Figure 3.38. Importance ranking scores by gender

3.4.6.2. Age

No significant differences were found between scores according to age (Table 3.21). Other than 0-4 years scoring the waiting room (277) higher than the treatment room (252), all ages scored staff the highest, treatment room second, followed by the waiting room and medical equipment with the lowest score (Figure 3.39).

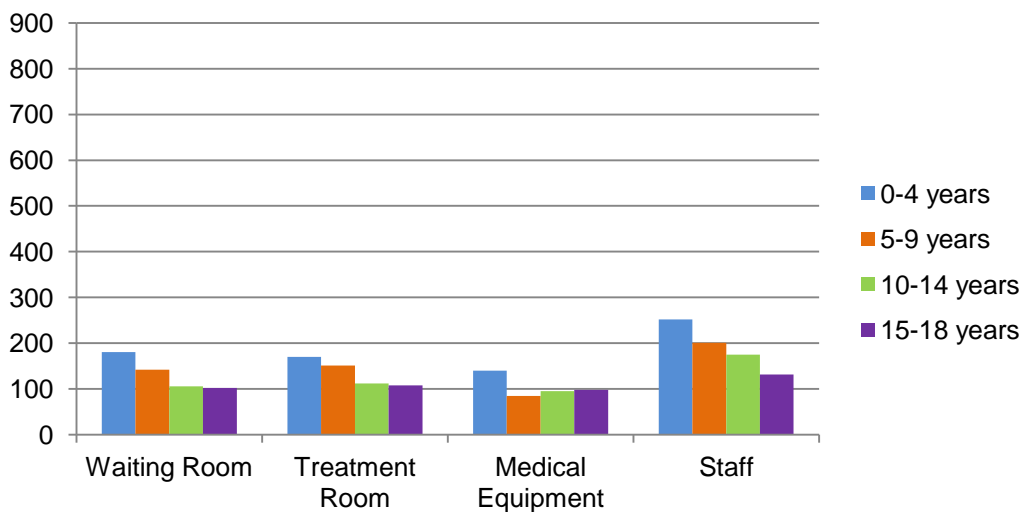


Figure 3.39. Importance rankings scores by age

3.4.6.3. Summary

- Staff scored consistently the highest regards importance
- Males and 0-4 year olds scored waiting room slightly higher than treatment room, however, no significant differences were found
- Although staff scored the highest, there were no large differences in scores found between the four areas

Table 3.21. Importance scores by age

	0-4 years					5-9 years					10-14 years					15-18 years					X ²
	High Imp. Score			Low Imp. Score	Total	High Imp. Score			Low Imp. Score	Total	High Imp. Score			Low Imp. Score	Total	High Imp. Score			Low Imp. Score	Total	
Waiting Room	56	69	36	20	181	36	60	30	16	142	12	54	24	16	106	28	42	18	14	102	.871
Treatment Room	16	66	78	10	170	28	72	44	7	151	8	45	54	5	112	40	24	36	8	108	.028
Medical Equipment	21	60	22	37	140	12	10	32	31	85	24	33	12	26	95	16	48	20	14	98	.170
Staff	200	30	14	8	252	160	21	14	6	201	152	12	8	3	175	92	18	14	8	132	.554

3.4.7. Positive and Negative Experiences

In order to examine the responses given when parents were given the opportunity to write about any particularly positive or negative experiences their child has had at a primary care practice and that they wish to share, thematic coding analysis was conducted: Thematic coding analysis is presented by Robson (2011, pp. 474) as '*a generic approach to the analysis of qualitative data. It can be used as a realist method, which reports experiences, meanings and the reality of participants, or as a constructionist method, which examines the ways in which events, realities, meanings and experiences are the effects of a range of discourse operating within society*'.

This form of analysis was conducted for the response sets of each of the three open-ended questions presented at the end of the survey.

When asked '*Please can you write about a particular **positive** experience that you remember your child having while at your local GP surgery and why you think this was*', the responses were analysed to generate the following themes:

- Doctor listening/talking/explaining things to child instead of parent
- Healthcare professionals showing child medical instrument and/or allowing child to hold medical instrument
- Friendly, calm and reassuring staff
- Treating child like an adult
- Distraction during procedures
- Music, books, play facilities, posters, fish tanks in the waiting room
- Pictures/drawings and toys in treatment room
- Rewards after procedures

There were many responses by parents stating how when doctors and other healthcare professional talk to their child directly and explain what they are doing and why they are doing it in a manner that the child can understand, always helps make their child feel more relaxed. Also, healthcare professionals that allow children to sometimes hold and even use medical instruments like a stethoscope on the parent first tend to help the child feel less anxious. The use of distraction during a procedure and rewards afterwards were also common themes throughout the responses. It is clear that parents appreciate when healthcare professionals make the effort with their child and are patient and friendly with them and, especially with teenagers, speak to them like an adult.

The parents valued having plenty to do, read and look at in the waiting room areas. As there can be long waiting times, keeping their child amused and busy while waiting to see the doctor was something that parents appreciated as it not only meant their child had something to do but that it also kept their child's mind off seeing the healthcare professional. Having things to look at such as posters and drawings in the treatment room was also mentioned as good and helpful for children.

When asked '*Please can you write about a particular **negative** experience that you remember your child having while at your local GP surgery and why you think this was*', the analysis generated the following themes:

- Doctor/nurse not patience, rude, not explaining things or giving much information to parent or child, not addressing child at all
- Rude, unhelpful receptionist and staff
- Unfriendly nurses
- Drab, gloomy waiting rooms
- Worn toys, out of date reading material, not enough for teenagers
- Horrible posters, uncomfortable furniture
- Long waiting times and boredom while waiting
- No reward after procedures
- Not liking look of medical instruments, not explaining what instrument is for and how it works

The majority of negative experiences that parents could recall were related to the behaviour of the staff. Healthcare professionals that were rude, impatient, did not speak to the child and only spoke to the parent and were generally unfriendly were predominant factors in children's negative experience at primary care practices. Receptionist and other staff were also found to be contributing factors towards negative experiences. The receptionist is the first member of staff that the child and parent see and this can impact on the overall experience.

Waiting rooms were described as being 'drab' and 'gloomy' with worn out toys, out of date reading material for the children and adults, medical posters that could seem frightening to a child and uncomfortable furniture. The waiting room could be the room that the most time is

spent in due to long waiting times and it was clear that when this environment has little to do and 'drab' then it can influence the overall experience for both child and parent.

In relation to the unfriendly healthcare professionals, when an instrument to be used is not described or shown to the child and they do not have it explained to them what it is used for, this can have a negative effect on the child as they do not know what to expect, especially if there is a chance the instrument could be uncomfortable or even hurt. One parent described their child feeling shocked when a certain instrument was used as it was painful and the child was not expecting it.

When asked '*Please add further comments you think relevant regarding visits with your child/ren to your local GP surgery*', the responses generated the following themes.

- Positive relationships with staff make a big difference
- Friendly receptionists
- Staff engaging with children, good rapport
- More child friendly waiting rooms with play areas and more for teenagers
- Waiting rooms for people of all ages
- Updated toys and reading material
- Rewards
- Parents preparing child for healthcare visits, educating child from an early age
- Parental influence on children's behaviours

When the parents were given the opportunity to add anything else they felt relevant to their child's emotional experience at primary care practices, most reiterated the positive aspects. It was stated that staff having a good rapport with patients and good, positive relationships with the healthcare professionals made a substantial difference to how their child felt about visiting primary care practices. When the healthcare professionals interacted directly with the children, the children are reported to have had much more positive experience. Several parents commented that their child came away feeling mature and happier about their illness/injury when the healthcare professional had gone through it with them and they understood. Receiving rewards after procedures for 'bravery' was mentioned, as well as having updated toys and reading material in the waiting areas. The waiting room environments were commented on as not having enough for teenagers to keep them occupied during long waiting times, especially for boys.

One of the other main themes was the behaviour of the parents themselves. Many parents stated that they make a point of explaining to their child why they are having to see a healthcare professional, what healthcare professionals are there to do and why certain procedures are necessary in order to help them. There was general consensus among some of the parents that educating their child was just as important for their child as the primary care practice environments and healthcare professionals.

3.4.7.1. Summary

The healthcare professionals and reception staff were described by parents in a positive light when they had been friendly, calm and reassuring, listened and explained things clearly to the child, not just the parent, and treated the child like an adult. Negative experiences shared by parent's involved healthcare professionals and receptionist staff being rude, unfriendly, impatient and not addressing the child at all.

3.5. Interview Methodology

Interviews, much like questionnaires, are a widely used social research method, and there are many different types. Robson (2011) states that interviews can be the primary or sometimes only approach used in studies, as in surveys or many grounded theory studies (please refer to section 3.1.3). Interviews are also stated to lend themselves well to be used in combination with other methods (mixed method approach).

Interviews can be a very flexible and adaptable way of finding things out, depending on the decided structure of the interview. Table 3.22 contains descriptions of the three most well-known forms of interview structure; fully structured, semi-structured and unstructured. The structure can be decided by the researcher according to the type of data extraction required. The table also contains the advantages and disadvantages of different techniques used to conduct interviews: face-to-face, telephone, or postal/self-administered interviews.

Researchers in the disciplines of both psychology and sociology favour interviews as their qualitative method of choice (Potter and Hepburn, 2005; Robson, 2011) although the validity of data gathered through interviews has been queried. Houtkoop-Steenstra (2000), after a detailed analysis of the interaction between interviewers and respondents in standardised social survey interviews, suggested that interview results can only be understood as “products of the contingencies of the interview situation, and not the unmediated expressions of respondents’ real opinions” (Robson, 2011).

Table 3.22. Advantages and disadvantages of the three interview methods (adapted from Robson, 2011)

Method	Characteristics	Advantages	Disadvantages
Fully structured interview	<ul style="list-style-type: none"> - Predetermined questions with fixed wording and order - Differs from interview-based survey questionnaire as it uses a greater number of open-response questions 	<ul style="list-style-type: none"> - Question set is standardised for each participant - More straight forward to compare responses of respondents 	<ul style="list-style-type: none"> - Cannot modify line of enquiry depending on response - Does not fit easily into flexible design studies
Semi-structured interview	<ul style="list-style-type: none"> - Interview guide is used that serves as a checklist of topics - Wording and order of questions can be substantially modified based on flow of interview - Additional unplanned questions can be asked to follow up on what interviewee says 	<ul style="list-style-type: none"> - Widely used in flexible designs - Can be used in a group setting (focus group) - Considerable freedom in sequencing of questions and wording 	<ul style="list-style-type: none"> - Can make for more difficult analysis when comparing responses if questions were not standardised
Unstructured interview	<ul style="list-style-type: none"> - Interviewer has general area of interest and concern but allows conversation to develop - Can be completely informal 	<ul style="list-style-type: none"> - Widely used in flexible designs - Can be used in a group setting (focus group) 	<ul style="list-style-type: none"> - Not an easy option for a novice - Makes for more difficult analysis when comparing responses
Face-to-face interview	<ul style="list-style-type: none"> - Interviewer and interviewee meet face-to-face to conduct interview - Can be in person or over video call/Skype - Can be fully, semi or unstructured 	<ul style="list-style-type: none"> - Can modify one's line of enquiry, following up interesting responses - Non-verbal/visual cues can be observed - Can be longer than a telephone interview 	<ul style="list-style-type: none"> - Making/confirming/rearranging interview arrangements
Telephone interview	<ul style="list-style-type: none"> - Interview is conducted over the telephone - Can be fully, semi or unstructured 	<ul style="list-style-type: none"> - Can be quicker and cheaper to carry out than a face-to-face interview - Rules out interviewer characteristics on responses causing any bias 	<ul style="list-style-type: none"> - Non-verbal/visual cues cannot be observed - Needs to be relatively short in comparison to face-to-face interview which can be longer
Postal or email interview	<ul style="list-style-type: none"> - Interview is presented as a paper-based questionnaire and send through the post - Possibility of questionnaire being sent online - Can only be fully structured 	<ul style="list-style-type: none"> - Inexpensive to conduct - Respondent can reflect on answer before replying - No interviewer effect bias 	<ul style="list-style-type: none"> - Cannot modify line of enquiry depending on response - Non-verbal cues cannot be observed

The second research method chosen to help achieve objectives 2 and 3 was that of face-to-face semi-structured interviews. Interviews, as previously stated, lend themselves well to be used in combination with other methods and it was decided they would be used in conjunction with the quantitative questionnaire-based survey also used (sequential triangulation).

A semi-structured interview was chosen due being able to follow a set question guide but with flexibility to ask any unplanned questions should they be needed. Face-to-face interviews are the ideal technique to be utilised but as they are not always possible, telephone interviews were offered as an alternative.

Interviews of healthcare professionals helped enable the collection of information on children's emotional experiences at primary care practices (objective 2) from a different perspective and in more detail than a survey. Through the use of an interview more thorough, information rich data was obtained on possible areas for adjustment and/or improvement (objective 3).

3.6. Healthcare Professional Interview Design

A semi-structured, focused interview schedule (Appendix 3.2) was designed for the extraction of information from healthcare professionals about their experiences with children at their place of work. The majority of questions in the interview were open-ended. The advantages of these are:

- Flexibility
- Allows the researcher to go into more depth/clear up misunderstandings
- Enables testing of the limits of a respondent's knowledge
- Encourages cooperation and rapport
- Allows the researcher to make a truer assessment of what the respondent really believes
- Produces unexpected or unanticipated answers

The schedule began with an introduction of the researcher and the research question, followed by some general, 'warm-up' questions (section 1) to gather some basic demographics on the interviewee (Figure 3.40). They were then asked how many children and young persons under 18 they dealt with each week, and whether this was for routine/minor procedures or for more serious illnesses.

The following section (Section 2) formed the main body of the interview. It was divided in to three parts and asked about the interviewee's place of work. The first (part 2.1) asked about

the reception/waiting area at their place of work (Figure 3.41) with respect to the suitability of the general décor for children and young persons. Prompts were used to help extract the required information from the interviewee. The second question asked if there were any changes that the interviewee thought could be made to the reception/waiting area to create a more welcoming or more relaxed environment for children and young persons with a prompt about barriers or restrictions on what could be implemented in the waiting area.

1. GENERAL QUESTIONS

1. What is your profession within healthcare i.e. nurse, doctor, physiotherapist, psychologist, etc.?

2. On average, approximately how many children/young persons under the age of 18 do you deal with a week?

0-9 10-19 20-29 30-39 40+

3. Do you treat persons under the age of 18 for routine/minor procedures i.e. blood tests, vaccines, check-ups, physiotherapy rehab, etc.?

Yes No

If yes, give examples: _____

4. Do you treat persons under the age of 18 for more serious illnesses i.e. cancer therapy, cystic fibrosis treatment, etc.?

Yes No

If yes, give examples: _____

Figure 3.40. Extract of interview schedule showing the demographic questions

2.1 THE RECEPTION/WAITING AREA

Please think about the reception and waiting area in the practice where you work when answering and answer for the following questions.

5. Do you consider the general decor suitable for young children and young adults or do you feel it is geared more towards the older patients (adults over 18)?

Prompts: wall hangings, decorations, posters, furniture, toys, magazines/books, TV - are there plenty of distractions available for them while they wait, is it a friendly or relaxing atmosphere etc.

6. Personally, are there any changes that you think could be made to the reception and waiting area at the practice where you work to create a more welcoming/relaxing environment for young children and young adults?

Prompts: are there any barriers/restrictions on what could be implemented?

Figure 3.41. Questions about the reception/waiting area at the interviewee's place of work

Section 2.2 asked about the treatment room/area (Figure 3.42). They were asked if they thought this room was suitable for children and young persons under 18 with prompts about the friendliness of the environment and whether wall hangings and posters were suitable for young children. They were asked what changes they would make (personally) to make it more suitable for children and young persons under 18.

2.2 THE TREATMENT ROOM

Please think in particular about the treatment room itself or one of the treatment rooms you regularly use for the following questions.

7. Do you consider this room to be suitable for young children and young persons under 18?

Prompts: e.g. does it come across as a friendly/intimidating/adult orientated environment? the general decor in this room suitable for young children and young adults wall hangings, decorations, posters, furniture? allow for persons of all ages?

8. If you could make any changes to allow it to be more suitable for those under the age of 18, what would these be?

Prompts: barriers/restrictions

Figure 3.42. Questions about the treatment room at the interviewee's place of work

Section 2.3 asked about the medical instruments used by the interviewee (Figure 3.43). They were asked whether they thought the medical instruments were, in general, designed with any consideration for aesthetics. They were also asked whether they felt the appearance of medical instrument could contribute to the level of compliance with treatment by children and young persons.

2.3 MEDICAL INSTRUMENTS

Please think about medical instruments you use on a weekly basis (i.e. stethoscope, syringes, blood pressure monitors, aural thermometers, IV drips, dialysis machines, etc.) when answering and answer the following questions.

9. Do you consider medical instruments, in general, to be designed with any consideration for aesthetics (how it looks)?

Prompts: instruments patients see/use themselves, entirely functionally designed, same instruments used on children as for adults

10. Do you feel that the appearance of medical instruments could contribute to level of compliance with treatment when it comes to young children and young adults?

Prompts: could the sheer 'look' of it enhance or inhibit the likelihood of them complying with treatment that required the use of that instrument? Do you think medical instruments could be designed in a way that allows them to still perform the necessary procedure/task it is designed for but also be designed to be more aesthetically pleasing for young children and young adults?

Figure 3.43. Questions about the medical instruments used at the interviewee's place of work

The final section (section 3) asked if there were any particular positive or negative experiences they had had while treating children or young persons under 18 (Figure 3.44). They were asked if there was maybe a particular method that they tried that helped children or under 18s cope better with healthcare environments or procedures, or a method they tried that did not help.

3. OTHER COMMENTS
<p>Could you describe briefly a particular <i>positive</i> experience you have had or any methods you personally have tried that <i>helped</i> children cope with healthcare environments or procedures when under the age of 18.</p>
<p>Could you describe briefly a particular <i>negative</i> experience you have had or any methods you personally have tried that <i>did not help</i> children cope with healthcare environments or procedures when under the age of 18.</p>
<p>Thank you for taking the time to partake in this interview.</p>

Figure 3.44. Questions asking the interviewee to state a particular positive or negative experience they have had treating children and young persons under 18

3.5.1. Sampling Strategy

The target sample was healthcare professionals with experience treating children and young adults under 18 years old. Healthcare professionals from varying sectors were accessed using opportunity sampling, for example, known to the researcher or through contacts. They were approached via email to provide an information sheet that explained the detail of the research being conducted and why they were being approached (Appendix 3.3). If the healthcare professional agreed then an interview was arranged at their convenience. The interviewees were each asked to sign a consent form (Appendix 3.4) and the interviews ran from June to December 2011.

3.5.2. Interview Analysis

The qualitative data collected from each interview were analysed with thematic coding. This allows the researcher to reflect on what the coded segments tell you and its meaning to the project, and ask questions about how they relate to other ideas from the data and construct theories about those relations (Richards, 2009). It can be performed using software or by hand. This analysis was done by hand due to the small number of interviews ($n = 4$).

3.5.3. Ethical Approval

Ethical approval for the interviews was sought by completing Loughborough University's Ethical Clearance Checklist which was approved by Loughborough University's Advisory Committee.

3.6. Results

This section details the results of the healthcare professional interviews.

Healthcare professionals were contacted and four agreed to participate. The results are presented according to the order of the topics in the interview schedule:

- Demographics
- Reception/waiting room
- Treatment room
- Medical Instruments
- Positive and negative experiences

3.6.1. Demographics

The participants all dealt with children and young adults regarding routine and minor procedures and consultations, but only the two hospital based nurses dealt with children for more serious procedures. The detailed demographics are shown in Table 3.23.

Table 3.23. Demographics of healthcare professional interviewees

Interviewee No.	Occupation	No. of children see a week	Do you treat for routine/minor procedures?	Do you treat for more serious procedures?
1	Hospital Nurse	Approx. 10-20	Yes. Examples: mainly blood tests, dressing changes, vaccinations, height and weight measurements, intravenous medication, collecting body fluid samples	Yes. Examples: treat for cystic fibrosis, cancer, meningitis, epilepsy, diabetes and encephalitis
2	Paediatric Hospital Nurse	Approx. 30-40	Yes. Examples: acute care for children who come to hospital ill, then also blood tests, doctor reviews and routine treatments	Yes. Examples: The ward takes on every difference illness type including those ones and also aplastic anaemia, serious accidents or traumas, meningitis, epilepsy, etc.
3	General Practitioner	Approx. 15	Yes. Examples: routine procedures, check-ups	No.
4	Teacher of the Deaf	Approx. 12	Yes. Examples: help during consultations children have with hearing specialists	No.

3.6.2. Waiting Room Environment

Meaningful elements of the data were identified and given 'codes'. The elements selected to be coded ranged from, for example:

- specific acts or behaviours of patients mentioned,
- events that have happened,
- strategies or practices the healthcare professional themselves know of or have tried,
- relationships or interactions between people,
- conditions or constraints, and
- environmental factors

These elements were then sorted in to themes. Figure 3.45 shows a thematic network diagram of the four themes; the physical environment, barriers, distractions and feelings, with sub themes in Table 3.24.

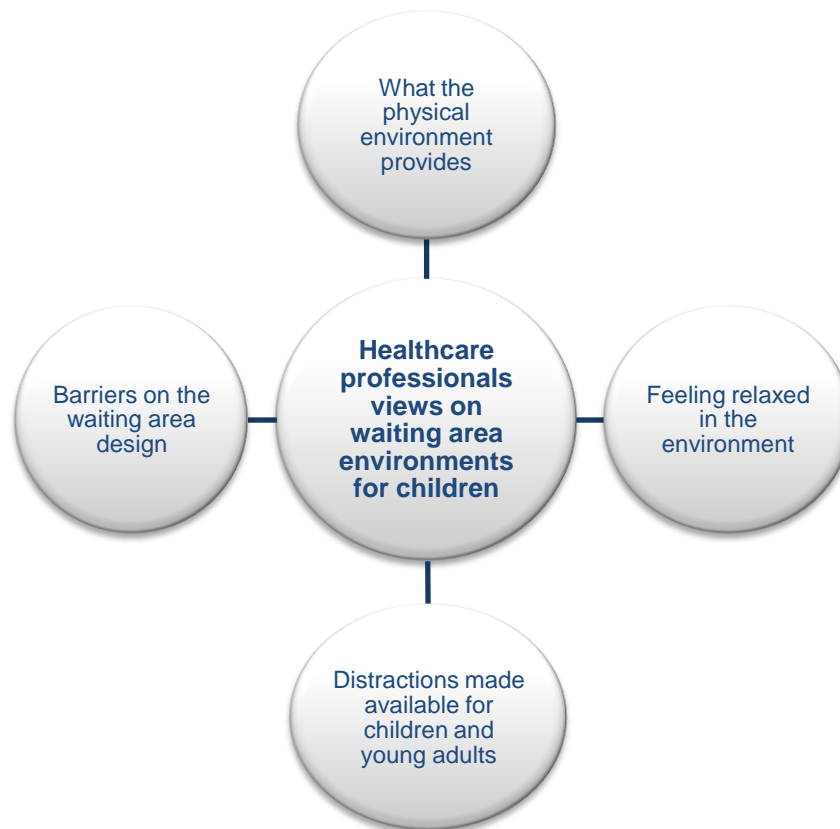


Figure 3.45. Thematic network showing the four main themes identified from the healthcare professionals responses about waiting areas for children

Table 3.24. Themes and sub themes

	Themes			
	Physical Environment	Barriers	Distractions	Relaxed
Sub themes	Space	Space	Play Area	Children Relaxed
	Child Friendly	Money	Play Items/Play	Parents Relaxed
	Play Area	Clinical Necessity	For Adolescents	
	Child Decor	Building Age	Child Decor	

When the healthcare professionals were questioned about the suitability of the décor (posters, decorations, toys, furniture, books, etc.) of the waiting area where they worked in regard to young children and young adults, three out of the four seemed to agree that it was, with one disagreeing completely.

*‘Yes I think they are all [posters, toys, etc.] **suitable** for children’ (Interviewee 1).*

*‘There are **lots of toys and distractions** including a play table and a play worker... there are decorations made by children and Disney pictures on the walls’ (Interviewee 2).*

*‘This one’s quite **big** and there **are facilities for children** to play... you’ve got to be careful not to have too many unpleasant pictures lying around... it has to feel **non-threatening**’ (Interviewee 3).*

*‘It’s **all adults**. There’s nothing, not even a tokenism in the waiting room area to children... there’s **no concession to children**’ (Interviewee 4).*

The positive comments were made about having an area for play, toys and distractions, feeling relaxed and child-friendly pictures.

When asked if there was anything that they would change to the waiting area in respect to the children that visit their practice, all four were able to suggest changes. These were predominantly about the provision of distractions for children, for example, ‘play’ and having a play area or a better play area for younger children and more available for young adults.

*‘It would need a **larger play area**, a **dedicated adolescent area**, more private individual areas and **more space** for parents to stay 24/7’ (Interviewee 1).*

*‘**More things for older children**, maybe magazines, books, board games...’ (Interviewee 2).*

*‘Perhaps a **bigger** and a slightly **better play area**’ (Interviewee 3).*

'It could be more child friendly... they could put a small area with little tables and chairs and things for children while they're waiting' (Interviewee 4).

*'They could have a **dressing up area for them to play**, so it wouldn't be quite so new when you go in and see the doctor' (Interviewee 4).*

The most reoccurring barriers causing restrictions were that of space and money. To either increase the size of a play area or for the provision of a specific child or young adult area, more space would be required, and this required money.

*'It needs a new unit as it's currently housed in a very old building... this will not happen unless **money** is provided to build a brand new purpose built unit though' (Interviewee 1).*

*'I think the positioning of the waiting area is wrong as it is in the middle of a busy, chaotic ward and it is also **very cluttered**... the reception should be just for waiting to be seen' (Interviewee 2).*

*'Well if you want something else you've got to **pay** for it' (Interviewee 3).*

*'**Space** is obviously a problem, but they do have a waiting room so they could put a small area with little tables and chairs and things for children while they're waiting' (Interviewee 4).*

Table 3.25 contains quotes from each of the interviewees for the sub themes that were identified.

Table 3.25. Extracts of waiting room data according to sub-theme/code and theme

Theme	Sub-theme	Hospital Nurse	Paediatric Nurse	General Practitioner	Teacher of the deaf
Physical environment	Space	<i>'it would need... more private individual areas and more space for parents to stay'</i>		<i>'this [waiting room] is quite big'</i>	<i>'space is obviously a problem'</i>
	Decor		<i>'I feel the decor is more geared to the younger child'</i>	<i>'it can be a very clinical and sterile environment... it's got to be a welcoming environment, warm, clean, safe...'</i>	<i>'it's geared towards adults'</i>
	Play Area	<i>'it would need a large play area'</i>		<i>'currently the [play] area is outside the toilet'</i>	<i>'it's all adults... there's no concessions to children, it's based on that this is an adult clinic and we allow children in'</i> <i>'they could have a dressing up area for them to play, so it wouldn't be quite so</i>

					<i>new when you go in and see the doctor'</i>
	Child Friendly			<i>'perhaps if... there was a safe play area'</i>	<i>'it could be more child-friendly...'</i>
Barriers	Space		<i>'it is in the middle of a busy, chaotic ward and it is also very cluttered'</i>	<i>RE anything they'd change: 'perhaps bigger and slightly better play area'</i>	<i>'space is obviously a problem'</i>
	Money	<i>'this will not happen unless money is provided to build a brand new purpose built unit'</i>		<i>'well if you want something else [in the waiting room] you've got to pay for it'</i>	
	Clinical Necessity			<i>'also matters of keeping it clean, perhaps being washed regularly and always sterilised'</i>	
	Building Age	<i>'currently housed in a very old building'</i>		<i>'well this building is 300 odd years old... no it's to too bad'</i>	
Distraction	Distractions	<i>Agreed there are plenty of distractions for children while they wait</i>	<i>'there are lots of toys and distractions'</i>	<i>'if there's nothing for kids to do they get less relaxed, if they've got something to do like distract themselves like play...'</i>	<i>'there's nothing... not even a sort of tokenism in the waiting area for children'</i>
	Play Area	<i>'it would need a large play area'</i>		<i>'there are facilities for children to play'</i>	<i>'they do have a waiting room so they could out a small area with little tables and chairs and things for children while they're waiting'</i>
	Play Items/Play	<i>RE posters, toys, furniture, books: 'yes I think all those things are suitable in our waiting room'</i>	<i>'there are lots of toys and distractions including a play table and play worker'</i>	<i>'if they've got something to do like distract themselves like play...'</i>	<i>'there are toys in the waiting room of maternity but that's round the corner so you'd have to know it was there'</i>
	For adolescents	<i>'[it would need] a dedicated adolescent area'</i>	<i>'the only thing probably suitable for ages 10+ are the TV and Wii games... more things for older children, maybe magazines, books, board games'</i>	<i>'there are some surgeries that have televisions... but they usually tend to be boring as they play health things'</i>	
	Child decor	<i>RE posters, toys, furniture, books: 'yes I think all those things are suitable in our waiting room'</i>	<i>'there are decorations made by children and Disney pictures on the walls'</i>	<i>'you've got to be careful not to have too many unpleasant pictures lying around...'</i>	
Relaxed	Children relaxed			<i>'if there's nothing for kids to do they get less relaxed'</i>	<i>'it's quite daunting for them... esp. 2-3 year olds they tend to sort of get a bit scared and it's because it's just an</i>

					<i>adult environment... they're not going to be comfortable with [coming back regularly]'</i>
	Parents relaxed			<i>'from our point of view [child distractions are] also good for the parents as well because it gives them a chance to relax'</i>	

3.6.2.1. Summary

The responses show that although there does tend to be facilities and concessions to children in waiting areas, there appear to be opportunities to build on them and make them better still. Other than the provision of more space, there appears to be many smaller, lower costing, interior adjustments that can be made to help improve the waiting room environment for children and young adults. These interior adjustments are primarily around what is made available, distraction wise, for children and young adults and cover all aspects of the décor.

3.6.3. Treatment Room Environment

The same process that was used to analyse the waiting room data was used for the treatment room where meaningful elements of the data were identified and given 'codes'. These elements were then sorted in to themes. Figure 3.46 shows a thematic network diagram of the three themes; the physical environment, standards and distractions, with sub themes in Table 3.26.

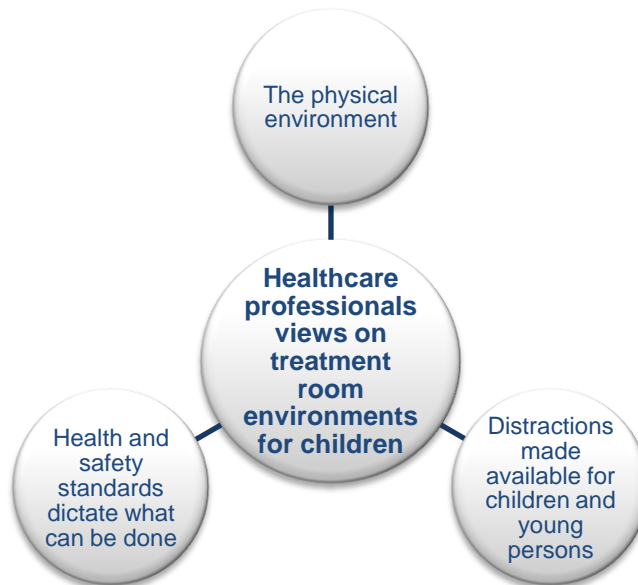


Figure 3.46. Thematic network showing the three main themes identified from the healthcare professionals responses about treatment rooms for children

Table 3.26. Themes and sub themes

	Themes		
	Physical Environment	Standards	Distractions
Sub themes	<i>Temperature control</i>	<i>Infection control/clinical necessity</i>	<i>Pictures</i>
	<i>Restrictions of building</i>		<i>Toys</i>
	<i>Friendly/intimidating decor</i>		
	<i>Décor/Furniture</i>		

When the healthcare professionals were questioned about the suitability of the décor (posters, pictures, toys, furniture, etc.) of the treatment room where they worked in regard to young children and young persons they generally shared the same views with respect to the environment being dictated by clinical nature of treatment rooms.

*'It is suitable **within the confines of the building**. Unfortunately a **clinical room** is just that and it is difficult to hide or disguise' (Interviewee 1).*

*'The **décor is quite plain**, but there are some **decorations** made by the children to distract them during procedures although not many. It does **look intimidating due to all the medical equipment but that is necessary** as that room is also used in emergency/crash situations' (Interviewee 2).*

*'The treatment room is of course by its nature... a more **clinical environment**. It's nice to have **pictures** on walls, a few **toys** for kids to play with... and we have these in all the treatment rooms here' (Interviewee 3).*

*'It's **very adult**... the only concession to **toys** [wooden boat with coloured men used for hearing tests] they're not really allowed to play with' (Interviewee 4).*

The positive comments made were about having decorations and distractions. The negative comments were about the clinical necessity of such an environment and the restrictions this and the building design can place on the environment.

When asked if there was anything that they would change to the treatment room in respect to the children that visit their practice they commented on aspects such as space and the types of decorations that could be available, three of the four commented on the overall feel of the environment also.

*'As before [RE waiting room] it would really need a **new purpose built unit**' (Interviewee 1).*

*'A TV or music to make the atmosphere a bit **more homely**. More **decoration** would be nice. Also better **heat control** as it is normally freezing or too hot!' (Interviewee 2).*

*'In an ideal world you'd like it to be nice and warm and cuddly and fluffy but you've got to have it **cleanable**. Doctor's surgeries tend to be a sort of **clinical environment**, there's no other way around it' (Interviewee 3).*

*'It needs **more space** and an area that you can **sit comfortably** with the children, softer chairs... just generally a **warmer environment**. Have nice **pictures** on the walls for the children that they've painted' (Interviewee 4).*

The main barrier causing restrictions were that of health and safety standards. These standards dictate the physical aspects of treatment rooms because they have to be frequently sterilised.

*'**Infection control** in a major factor of what can be in the room as such a variety of procedures take place there' (Interviewee 2).*

*'**Health and safety issues** dictate you have to have a floor of this nature which is hard and washable and therefore sterilisable. We used to have carpet but no longer can you do this because it's a source of infection, you can't clean them etc.' (Interviewee 3).*

Table 3.27 contains quotes from each of the interviewees for the sub themes that were identified.

Table 3.27. Extracts of treatment room data according to sub-theme/code and theme

Theme	Sub-theme	Hospital Nurse	Paediatric Nurse	General Practitioner	Teacher of the deaf
Physical environment	Temperature control		<i>'better heat control as it is normally freezing or too hot!'</i>		<i>'...and [it's] very hot, even though there's air conditioning'</i>
	Restrictions of building	<i>'it is suitable within the confines of the building'</i>			<i>'...it's very small...' 'it needs more space' '... in a tiny room'</i>
	Friendly / intimidating environment		<i>'it does look intimidating due to all the medical equipment' 'a TV or music to make the atmosphere a bit more homely'</i>	<i>'you'd like it to be nice and warm and cuddly and fluffy'</i>	<i>'it is [intimidating]' '...just generally a warmer environment you know' 'there's a computer with a big cover over it in one corner and it looks like something that might be painful...'</i>

					<p><i>you can't see what it is but you can see them thinking 'what is that under there?!' '</i></p> <p><i>'it just needs a completely different environment'</i></p> <p><i>'... I mean they [doctors] look a bit intimidating with their suits'</i></p> <p><i>'... when kids go in to an operation they wear brightly coloured gowns... something to just slip on that's sort of child-friendly it might make them feel a bit less intimidated'</i></p>
	Décor / Furniture	<i>'the décor is quite plain'</i>	<i>'more decoration would be nice'</i>	<i>'it's nice to have pictures on the walls'</i>	<p><i>'it needs an area that you can sit comfortably with the children, softer chairs'</i></p> <p><i>'the desks are utilitarian as well... could make them colourful and bright so the kids are quite attracted to them'</i></p>
Standards	Infection control / clinical necessity	<i>'unfortunately a clinical room is just that and is difficult to hide or disguise'</i>	<p><i>'I think the reason is because of infection control'</i></p> <p><i>'infection control is a major factor of what can be in the room'</i></p>	<p><i>'but you've got to have it cleanable'</i></p> <p><i>'H&S issues indicate you have to have a floor of this nature which is hard and washable and therefore sterilisable'</i></p> <p><i>'doctor's surgeries tend to be a sort of clinical environment'</i></p> <p><i>'it's a more clinical environment... and it has to be'</i></p>	
Distraction	Pictures		<i>'there are some decorations made by the children to distract them'</i>	<i>'it's nice to have pictures on the walls'</i>	<i>'have nice pictures on the walls for the children that they've painted'</i>
	Toys		<i>'there are toys and bubbles to distract the younger children'</i>	<i>'...a few toys for kids to play with while they're in, that sort of thing, little changes, all these things help'</i>	<i>'...they're not really allowed to play with them because they're not toys as such'</i>

					<i>'particularly difficult if they bring a little brother or sister with them, because they get bored'</i>
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3.6.3.1. Summary

The responses show that there are some concessions to young children in treatment room environments such as pictures, but not always. There also doesn't seem to be many concessions towards older children or young persons. There are very large restrictions placed by health and safety standards on what can be done in treatment rooms regards flooring and possibly furniture.

3.6.4. Medical Equipment

Using the same process, meaningful elements of the data were identified and given 'codes'. These elements were then sorted in to themes. Figure 3.47 shows a thematic network diagram of the four themes; the behaviour, design, aesthetics and emotion, with sub themes in Table 3.28.



Figure 3.47. Thematic network showing the four main themes identified from the healthcare professionals responses about waiting areas for children

Table 3.28. Themes and sub themes

	Themes			
	Behaviour	Design	Aesthetics	Emotion
Sub themes	Parent behaviour	Size	Colour	Positive
	HC professional behaviour	Function	Stickers/pictures	Negative
	Role play			
	Reward			

When the healthcare professionals were questioned about whether they considered medical instruments to be designed with any consideration for aesthetics, three of the interviewees shared similar opinions in that they are functionally designed.

*'They are entirely **functionally** designed' (Interviewee 1).*

*'I don't think they are designed to look nice and some things definitely **look scary**' (Interviewee 2).*

*'It's a **functional** design. And to be honest they have been that shape for as long as I've been there. There's been no alteration to them' (Interviewee 4).*

When asked whether they felt the aesthetic appearance of medical instruments could influence the level of compliance with treatment and what could be done to improve compliance, all commented on the use of colour.

*'**Colours** can be and are used to good effect. For example, a red, yellow, green or blue stethoscope. **Stick on pictures** are also used' (Interviewee 1).*

*'Yes I think they could make the **colours bright** and appealing –even put **pictures** on things to make them more appealing (Interviewee 2).*

*'You could make them **pretty colours** and you can **stick little things** on them to make them more interesting, you could do that' (Interviewee 3).*

*'You can have **sparkly or coloured** hearing aids now and so they can pick them. So they could do the same sort of thing with the instruments, because they have to change the head for the size of the child anyway so if they put **something colourful** on it... just little tiny things, **tiny alterations** would make it much less of a **threatening environment**' (Interviewee 4).*

Three of the interviewee's also mentioned the use of play and role play when dealing with young children and medical instruments. Two also comment on the behaviour of parents.

'I personally think that if the parents/carers are sensible and stand 'no nonsense' and can impact this on their children in a sensible, caring way then the child will not be fearful and will feel supported by the parents... parents who react badly themselves to such situations pass these feelings directly and indirectly to their children' (Interviewee 1).

*'We normally use the **reward** of a **sticker or certificate** if they comply with us, also letting them touch and feel the equipment. Or allowing them to **copy the procedure**, for example, listening to the heart on a **teddy** or a parent or myself to show them it doesn't hurt and **isn't scary**' (Interviewee 2).*

*'Also they can **play** with them' (Interviewee 3).*

'... to some extent it's [child's behaviour] dictated by how the parent perceives what's happening because if the parents are agitated the kids will respond to that' (Interviewee 3).

*'If they had the same implements **in a children's version**, they could put on a little white coat and do it with a **doll** at the same time. Just to give them that **comfort**' (Interviewee 4).*

Table 3.29 contains quotes from each of the interviewees for the sub themes that were identified.

Table 3.29. Extracts of medical equipment data according to sub-theme/code and theme

Theme	Sub-theme	Hospital Nurse (1)	Paediatric Nurse (2)	General Practitioner (3)	Teacher of the deaf (4)
Behaviour	Parent behaviour	<i>'I personally think that if the parents/carers are sensible and stand 'no nonsense' and can impact this on their children in a sensible, caring way then the child will not be fearful and will feel supported by the parents'</i>		<i>'to some extent it's dictated by how that parent perceives what's happening because if the parents are agitated the kids will respond to that'</i>	
	HC professional behaviour		<i>'allowing them to copy the procedure, for e.g., listening to the heart on a teddy or a parent or myself to show them it doesn't hurt and isn't scary'</i>	<i>'it's also down to how well the clinician handles the children and unfortunately it takes time to get them to believe you that you're not going to hurt them'</i>	
	Play		<i>'... also letting them touch and feel the equipment'</i> <i>'allowing them to copy the procedure, for e.g., listening to</i>	<i>'they can play with them'</i>	<i>'if they had the same implements in a children's version, they could put on a little white coat and do it with a doll at the same time...</i>

			<i>the heart on a teddy or a parent or myself to show them it doesn't hurt and isn't scary'</i>		<i>just to give them that comfort'</i>
	Reward		<i>'we normally use the reward of a sticker or certificate if they comply with us'</i>		
Design	Size		<i>'I think the same things are used, just changes on a size level between kids and adults'</i>	<i>'[children's instruments] are more colourful but they're different sized... pretty much the equipment we use on kids is much the same as you use on adults'</i>	<i>'oh yeah [same as used on adults] the only thing is the size of the tips on the end and things like that'</i>
	Function	<i>'... these instruments tend not to be designed just for children, they are designed for their purpose'</i> <i>'they are entirely functionally designed'</i>			<i>'it's a functional design... and to be honest they have been that shape for as long as I've been there... there's been no alteration'</i>
Aesthetics	Colour	<i>'colours can be used to good effect'</i>	<i>'I think they could make the colours bright and appealing –even put pictures on things to make them more appealing'</i>	<i>'you could make them pretty colours and you can stick little things on them to make them more interesting'</i>	<i>'they could be more colourful'</i> <i>'a stethoclip that you listen to their hearing aids with... that's just black plastic whereas you could make those quite colourful so the kids would be attracted by the colour'</i>
	Stickers / pictures	<i>'stick on pictures are also used'</i>			
Emotion	Positive			<i>'we try not to leave things around that cause anxiety... obvious things that they might worry about'</i>	<i>'... just little tiny things, tiny alterations would make it much less of a threatening environment'</i>
	Negative	<i>'parents who react badly themselves to such situations pass these feelings directly and indirectly to their children'</i>	<i>'I don't think they are designed to look nice and some things definitely look scary'</i>		

3.6.4.1. Summary

The responses from all interviewees show the design of medical instruments generally tends to be functionally, with not much consideration for aesthetics. All interviewees also show that

they consider the use of colour and play to be of benefit when it comes to using instruments on children.

3.6.5. Positive and Negative Experiences

Using the same process, meaningful elements of the data were identified, given ‘codes’, and then sorted in to themes. Figure 3.48 shows a thematic network diagram of the three themes; the use of distraction techniques, the behaviour of the parent/s, and the behaviour of the healthcare professional/s, with sub themes in Table 3.30.

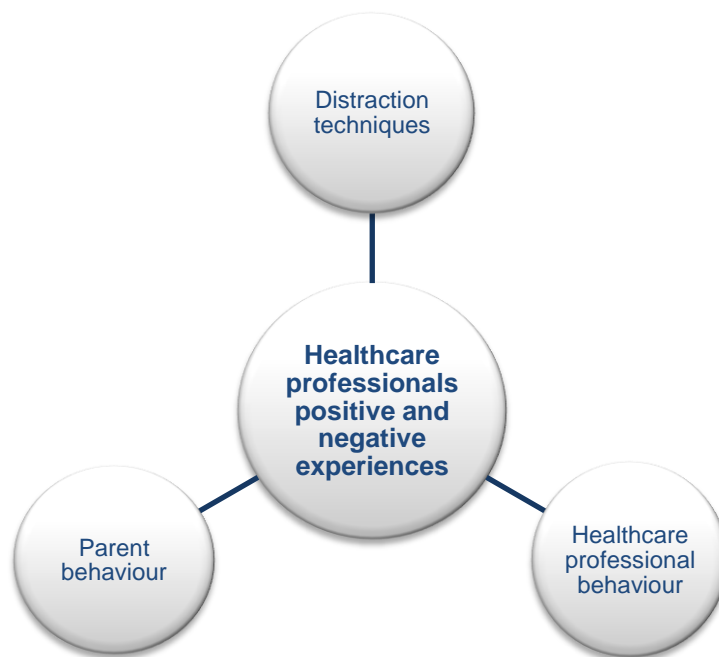


Figure 3.48. Thematic network showing the four main themes identified from the healthcare professionals responses about waiting areas for children

Table 3.30. Themes and sub themes

	Themes		
	Distraction	Parent Behaviour	Healthcare professional behaviour
Sub themes	Toys	Parent education of healthcare	Attitude/behaviour toward child
	Role play	Parent behaviour influencing child behaviour	Attitude/behaviour toward parent

When the healthcare professionals were asked to describe any particularly positive experiences they could remember when treating children, three of the interviewees shared similar experiences with use of distraction techniques during a procedure.

*'**Distraction** techniques can help during procedures' (Interviewee 1).*

*'We have an umbrella and inside it hanging are cut out animals and round the side has cellaphaney tassles. So when doing blood tests you can put this over the child, put their arm out the side for the doctor while the child can be **distracted** by the animals and **doesn't see things like the needle**' (Interviewee 2).*

*'You can **draw pretty pictures** for them... and as you give them a present it actually distracts them... patients respond better if you **relax** them and **give them something to do**' (Interviewee 3).*

*'If you give them something that's going to **distract** them especially if they're **anxious** and worried, it is quite good, and it **helps calm the parents down too**' (Interviewee 3).*

The interviewees also recalled positive experiences regarding the behaviour of healthcare professionals themselves.

*'The sending of **parents** out of the room if **not helpful** themselves can be more positive for the child as well' (Interviewee 1).*

*'Completing things **on a teddy like a cannula** so they match the child sometimes helps' (Interviewee 2).*

*'And the other positive experience in terms of treating children is of course **explaining effectively**. We have print outs for the parents... it helps assist them as an educational thing' (Interviewee 3).*

*'He [Doctor] had a **teddy with hearing aids** and things and he was trying to use that to explain to her what was happening and it was his whole way of dealing with her, he got down to her level... he took his time, he played with her' (Interviewee 4).*

*'He actually brought toys with him for that, and **got rid of** all the stuff that might look like it might be **scary**' (Interviewee 4).*

When asked to describe any particular negative experiences they could remember, three of the interviewee's referred to the behaviour of parents, and that refer to behaviour of the healthcare professionals.

*'Parents and carers need more **education** about their child in healthcare environments' (Interviewee 1).*

*'Also **doctors not listening** when children are needlephobic and them just putting a needle straight in them **without even listening or trying to support them through it**' (Interviewee 2).*

*'Some children are clearly ill behaved that **the parents do nothing** about' (Interviewee 3).*

*'When Mum came to the clinic, it was a nightmare, she'd scream all the time, she wouldn't cooperate... the next time she came with **her Dad who wasn't having any of it**, and she did as she was told and cooperated' (Interviewee 4).*

*'You get some parents who are very aggressive and unpleasant, or think they're not getting their own way, and **it rubs off on the children**. We had one parent who told the doctor to f*** off and stick his hearing aids where the sun don't shine, and marched out... their [the children] **attitude comes from the parents** rather than the professionals' (Interviewee 4).*

*'It's **how the doctors deal with the parents**, rubs off on children. Because if the parents have confidence in the doctor, you can see them relax visually and the child does. But again it depends so much on the **personality of the doctor and the nurses**, if they're OTT and bouncy then it's great. So much of it's to do with how they respond to the children, and you can tell when somebody doesn't like children, it's not easy to disguise' (Interviewee 4).*

Table 3.31 contains quotes from each of the interviewees for the sub themes that were identified.

Table 3.31. Extracts of positive and negative experiences according to sub-theme/code and theme

Theme	Sub-theme	Hospital Nurse (1)	Paediatric Nurse (2)	General Practitioner (3)	Teacher of the deaf (4)
Distraction	Toys	<i>'distraction techniques can help during procedures'</i>	<i>'we have an umbrella and inside it hanging are cut out animals and round the side has cellaphaney tassles. So when doing blood tests you can put this over the child, put their arm out the side for the doctor while the child can be distracted by the animals and doesn't see things like the needle'</i>	<i>'You can draw pretty pictures for them... and as you give them a present it actually distracts them... patients respond better if you relax them and give them something to do'</i> <i>'if you give them something that's going to distract them especially if they're anxious and worried, it is quite good, and it helps calm the parents down too'</i>	<i>'he actually brought toys with him for that, and got rid of all the stuff that might look like it might be scary'</i>

	Role play/play		<i>'also completing things on a teddy like a cannula so they match the child sometimes helps'</i>		<i>'he [the doctor] had a teddy with hearing aids and things and he was trying to use that to explain to her what was happening and it was his whole way of dealing with her, he got down to her level... he took his time, he played with her'</i>
Parent behaviour	Parent education of healthcare	<i>'parents and carers need more education about their child in healthcare environments'</i>		<i>'we have print outs for the parents... it helps assist them as an educational thing for parents'</i>	<i>'you get some parents who are very aggressive and unpleasant, or think they're not getting their own way, and it rubs off on the children. We had one parent who told the doctor to f*** off and stick his hearing aids where the sun don't shine, and marched out... their [the children] attitude comes from the parents rather than the professionals'</i>
	Parent behaviour influencing child behaviour	<i>'the sending of parents out of the room if not helpful themselves can be more positive for the child'</i> <i>'keeping an overprotective silly mother in the room whilst performing a lumbar puncture on a child suspected of having meningitis!'</i>		<i>'some children are clearly ill behaved that the parents do nothing about'</i>	<i>'when Mum came to the clinic, it was a nightmare, she'd scream all the time, she wouldn't cooperate... the next time she came with her Dad who wasn't having any of it, and she did as she was told and cooperated'</i>
Healthcare professional behaviour	Attitude/behaviour toward child		<i>'also doctors not listening when children are needlephobic and them just putting a needle straight in them without even listening or trying to support them through it'</i>	<i>'and the other positive experience in terms of treating children is of course explaining effectively'</i>	<i>'it's how the doctors deal with the parents, rubs off on children. Because if the parents have confidence in the doctor, you can see them relax visually and the child does'</i> <i>'it's not that there's not empathy, because I think the staff have tried to be empathic, but it becomes a job... the staff are not trained to deal with children'</i>

	Attitude/ behaviour toward parent			<i>'we have print outs for the parents... it helps assist them as an educational thing for parents'</i>	<i>'but again it depends so much on the personality of the doctor and the nurses, if they're OTT and bouncy then it's great. So much of it's to do with how they respond to the children, and you can tell when somebody doesn't like children, it's not easy to disguise'</i>
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3.6.5.1. Summary

The use of distraction and role play/play with children was a common theme amongst positive experiences with and for children. The attitude and behaviour of some parents was an area identified as a contributing factor towards the behaviour of children and the suggestion that education for these parents regards child healthcare could be improved. The manner in which healthcare professionals themselves act towards children and how appropriately they take in to consideration the age and likely fears of certain ages was also an area identified.

3.7. Discussion

The aim of the studies was to explore parent and healthcare professional experiences of healthcare products and environments for children and young people under 18 years (objective 2) and to identify areas for feasible design adjustment/improvement in the waiting room environment, treatment room environment, medical equipment and staff behaviour (objective 3). This section discusses the findings of the parent survey and healthcare professional interviews in relation to these objectives.

3.7.1. Parent behaviour

The healthcare professionals all made reference to parent behaviour influencing the behaviour of the child coinciding with literature that also suggests that parents' behaviours may represent attempts to influence their children (Kopp, 1982). Behaviours such as reassurance, empathy, criticising, and bargaining with a child have been related to increased child distress, whereas distraction and nonprocedural talk have been related to decreased levels of distress (Blount *et al.*, 1989; Cohen, Manimala and Blount, 2000; Dahlquist, Power & Carlson, 1995; Frank *et al.*, 1995; Gonzalez, Routh and Armstrong, 1993; Sweet and McGrath, 1998).

It seems that parents who have a good understanding of healthcare themselves have a better attitude towards their child's healthcare. As suggested by one of the healthcare professionals '*parents and carers need more education about their child in healthcare environments*'. So an underlying factor could be that of the lack of education for parents when it comes to their children's healthcare, and an unawareness that their own behaviour can influence their children's behaviour. Another healthcare professional explained how they '*have print outs for the parents*' as it helps assist them as an '*educational thing*'. Presumably this is to explain more about the illness their child has and information about the treatment. However, this did not appear to be something that was standardised across the NHS. Perhaps what is lacking is information about the needs of a child depending on the age and developmental level so parents can act accordingly. Vasey, Crnic and Carter (1994) argue that worries about threats to well-being predominated among 5-6 year olds and that from the age of 8 years, worry becomes increasingly complex because as they develop their ability to reason about future possibilities and to elaborate potential negative consequences dramatically increases. The age of a child determines how realistic their appraisal of what happens during illness will be and parents should be aware and supportive of this.

3.7.2. Staff behaviour

As discussed in Chapter 2, psychosocial elements of an environment or a service are becoming increasingly recognised as a main factor affecting people's experiences. Practice staff consistently scored the highest amongst parents regarding what they considered the most important aspect of their practice regards their child's emotional experience. Positive experiences expressed by parents also largely revolved around the staff when they behaved appropriately towards their child and negative experiences when the staff did not. Even the healthcare professionals themselves expressed the importance of their own behaviour towards the child being treated and to the accompanying parent/s.

Referring to 'the four pleasures' by Tiger (1992), it is most likely the social and psychological type of pleasure that is most relevant regards staff behaviour towards patients. Socio-pleasure is the enjoyment derived from relationships with others, and psycho-pleasure refers to people's cognitive and emotional reactions (Jordan, 2000) to an object or environment. Socio-pleasure will be low for parents and children if staff (receptionists and clinicians) are rude, unsympathetic to the age of a child and don't explain things well to child or parent. This type of experience could impact psycho-pleasure by not providing a positive cognitive or emotional experience. The provision of information about children's healthcare that is pitched at the right level for both child and parent could also help improve psycho-pleasure.

When uncertainty about what could be expected is reduced, the experience can be made less distressing (Kent and Dalgleish, 1986).

3.7.3. Waiting Room Environment

Three areas were identified for discussion during analysis of the waiting room environment: the general décor, entertainment and distraction material available and the main barriers impacting waiting room design.

3.7.3.1. *Décor*

Other than the provision of materials for entertainment purposes, there also appear to be many smaller, relatively low cost interior design adjustments that could improve the waiting room environment for children and young persons, for example: furniture, posters, pictures, decorations, wall colour, lighting and room layout. Parents frequently made reference to drab, gloomy waiting rooms, horrible posters and uncomfortable furniture. Aspects of the general decor can play a large part in the patient's opinion of the practice as a whole. Arneil and Devlin (2002) found that the waiting room environment can influence the perceived quality of care for that practice. They concluded that designers of healthcare environments should plan the environment with the patient in mind and approaching waiting room design in this manner may affect whether or not the final product looks and feels comfortable and inviting to its patients. Even more importantly, it may affect patients' perceptions of the quality of care, satisfaction with care, and health outcomes (Arneil and Devlin, 2002).

With respect to providing decor that is also suitable for children, good examples come from hospitals and clinics that are specifically for children and young persons. Bishop (2008) identified significant attributes of the physical environment of paediatric hospitals that contributed to children and young people's experience and their relationship to the feeling of well-being. Similarly to the findings of the survey and interviews, several aesthetic features were identified by Bishop including artwork, colour and brightness. It was discussed that 'through these three aesthetic elements, children and young people perceive messages of welcome, comfort, appropriateness and fun.' In combination, these three elements helped children and young people to 'sustain a positive frame of mind and to remain positively engaged, both of which directly contributed to their feeling of well-being.' These environmental attributes were said to help provide an atmosphere of welcome and comfort. The type of artwork that was observed at the Children's Hospital at Westmead (Australia) that was used as the site of Bishop's study was that of artwork done by the children themselves. One example was that of a butterfly mural (Figure 3.49).



Figure 3.49. Butterfly mural at the Children’s Hospital Westmead, Australia (Bishop, 2008)

An example in the UK of this kind of artwork was found in a Leicestershire Partnership NHS Trust primary care practice where children from a local RNIB school painted pictures that were hung up in the waiting room (Figure 3.50). Bishop argued that this kind of artwork ‘illustrates how much of an impression something so simple can make on children and young people’s feeling of ownership and welcome in an environment.’ The butterfly mural would be too much to have in an environment used by patients of all ages but the principle of the children feeling they have a sense of ownership and feel welcome still applies. The kind of artwork done by the RNIB school students is an example of art that is likely to be appreciated by adult patients also as it is not too impacting on the environment as a whole.

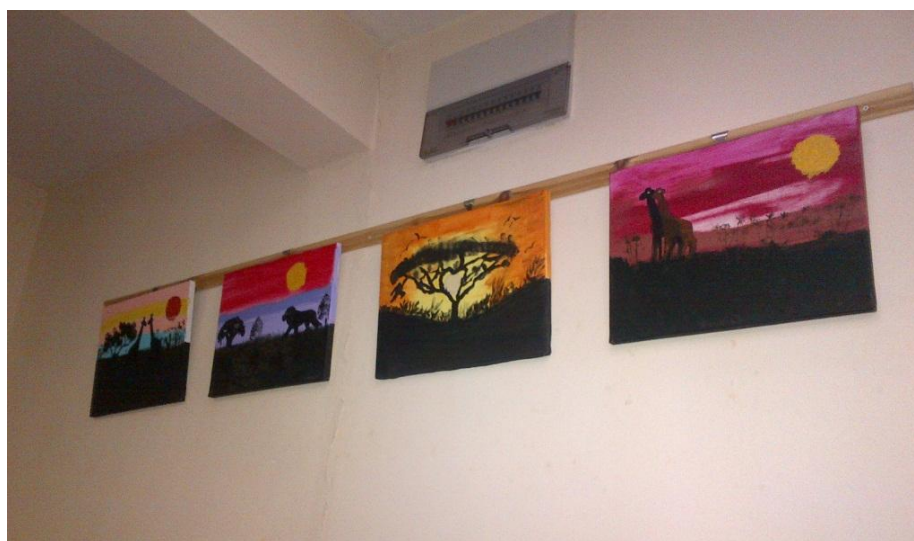


Figure 3.50. Paintings by local RNIB school students

The African wildlife theme of the paintings in Figure 3.50 helps demonstrate the use of not only colour but of nature. The use of nature in artwork in healthcare settings has been a relatively new research area. However, the research has shown that there are stress-reducing properties of natural elements in built healthcare environments (Dijkstra, Pieterse and Pruyn, 2008) and short term visual contacts with nature can be effective in promoting recovery from stress (Ulrich, 1991).

3.7.3.2. Entertainment and distraction

One of the findings of the survey showed that 0-4 year olds were the most amused and interested in the waiting room. An explanation for these findings could be that younger children are catered for with toys and play areas, whereas entertainment material for older children and young people is more absent. This would also explain why 0-4 and 5-9 year olds were also found to be the most relaxed and why 15-18 year olds were found to experience the most boredom.

Positive comments referred to the use of music, books, play facilities and fish tanks in waiting rooms suggesting that patients appreciate positive distractions in the environment that take their mind off the healthcare practice (Ulrich, 1991; Arneil and Devlin, 2002). The type of music, books and play, however, appears to be geared more towards the very young or towards older adults – although this material can sometimes be largely out of date. The materials provided for patients of any age are an important aspect of a waiting room environment due to the variability of patient age and waiting times. Delays in appointments are an unfortunate inevitability within healthcare. In the US, it was reported that the average time patients spend waiting to see a primary care doctor provider is 22 minutes, with some waits stretching for hours, according to a 2009 report by Press Ganey Associates, a health-care consulting firm, which surveyed 2.4 million patients at more than 10,000 locations (The Wall Street Journal's Health Journal, 2010). With the knowledge that delays are frequent within most practices there should be an awareness that entertainment needs to be provided for all patients.

3.7.3.3. Design Barriers

A common theme that arose during the interviews when asked 'what restricts how waiting room environments are designed' was the space provided and the funds available to furnish and decorate this space. As discussed earlier, when elements of an environment pose restraints on what can be done, there may still be some flexibility regarding the interior design. For the practices based in older buildings where only a limited space is available for the waiting area, other than knocking the building down and starting afresh (which would be rather time and resource consuming) the focus can be placed on how that space is utilised

starting with small elements such as the pictures on the walls, the placement of medical related posters and leaflets, entertainment material, the utilisation of natural light, etc. Although some practices would ideally require a complete refurbishment or purpose built unit, this is not always feasible and so the most needs to be made of what is available.

Within a clinical environment there will always be restrictions on certain elements of the physical environment such as the furniture and floor (needs to be easily cleaned), which in turn affect the overall aesthetics of the room and the comfort of the patient. However, there are plenty of modern practices and hospitals that incorporate more aesthetically appealing furniture, flooring and general décor with the use of colour and different materials and more modern designs. These practices and hospitals show that an environment can be more interesting, pleasurable and comfortable but still accommodate the clinical nature of the environment.

Figure 3.51 and Figure 3.52 are examples of paediatric departments in hospitals in the United States, and have been designed by Array Healthcare Facilities Solutions (Yee, 2006). Although they are paediatric departments, they help demonstrate the use of colour and modern design whilst still adhering to clinical guidelines.

Not all aspects of an environment are practicable for replacing (e.g. furniture) due to funds, but the emphasis can be placed on more inexpensive items such as pictures and plants. Much research has been conducted on the restorative and stress-reducing effects of viewing nature in healthcare environments (Ulrich, 1991; Dijkstra, Pieterse and Pruyn, 2006, 2008; Smith, 2007).

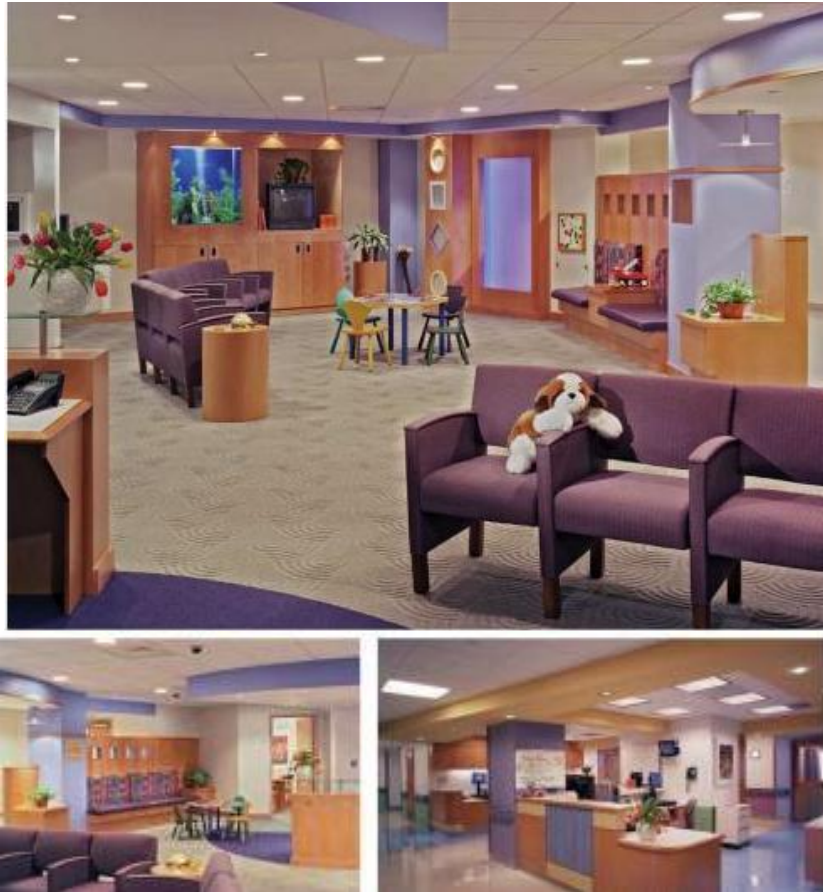


Figure 3.51. Array Healthcare Solutions - St. Barnabas Medical Centre, Paediatric Intensive Care Unit, Livingston, New Jersey (Yee, 2006)



Figure 3.52. Array Healthcare Solutions - Alfred I. DuPont Hospital for Children, Haematology/Oncology Unit, Wilmington, Delaware (Yee, 2006)

3.7.4. Treatment Room Environment

Three areas were identified for discussion during analysis of the treatment room environment: the general décor, the emotional response of different ages and barriers impacting on treatment room design.

3.7.4.1. *Décor*

The findings show that there are concessions toward young children in treatment room environments such as pictures and a few toys, but this is not consistent across all practices. There do not appear to be concessions toward older children or young persons, the pictures and decorations tend to aimed at young children or older adults. The findings of the survey showed that all age groups experienced boredom, but especially 10-14 year olds.

Positive feedback was received about the use of pictures and drawings and using toys for the young children in treatment rooms. Although the general decor of treatment rooms will be different to that of waiting rooms due to the more clinical nature and for the presentation of a professional atmosphere to the patients, the use of pictures drawn by children could help create a sense of welcome and ownership in this environment. Also, brighter coloured furniture and child specific furniture such as an adjustable child-sized chair would also help a child feel more welcome in the environment as opposed to climbing on to an adult sized chair and feeling like they are in an adult environment.

3.7.4.2. *Emotional response*

The results of the survey showed that with an increase in age there was an increase in both anxiety and tension in the treatment room environment. These findings could be explained using the conclusions from Rocha *et al.* (2003) and Rocha and Prkachin (2007) that the experiences of young children may affect behaviour in later childhood and possibly into adulthood. It can be assumed that older children and young adults will have had a higher number of visits to see a healthcare professional compared to younger children and these experiences could have led to this increase in these negative emotions due to increased familiarity with likely outcomes. At the age of 12, children are able to speculate about future events and outcomes whereas younger ages find this more difficult (Lueder and Rice, 2008). The content of worry also changes as children get older. Vasey, Crnic and Carter (1994) argue that due to advances in cognitive development around the age of 8 years, worry becomes increasingly complex because as they develop, their ability to reason about future possibilities, to consider multiple threatening outcomes, and to elaborate potential negative consequences dramatically increases.

Although the older age groups felt higher amounts of anxiety and tension, 15-18 year olds were the only age group to experience courage in the treatment room. This could also be explained due to their higher level of cognitive development for reasoning. They are more able to understand the benefits of seeing a healthcare professional than someone who is younger. Although the younger ages were not as anxious or tense, perhaps information could be provided for the younger ages, either directly to the children or through parents that helps explain why they are there to see a healthcare professional and potentially help towards feeling more courageous.

Coping strategies of children in healthcare situations could be more actively encouraged by knowing the types of coping strategies used by young children and what they find effective. Salmela *et al.* (2009) reported that the most frequent child-reported coping strategies were the presence of parents and other family members, the help of hospital staff, positive images and humour, play and the child's own safety toy. The results of this study were similar to the findings of the parent survey and interviews. The coping strategies where the children themselves played (either directly with a toy or by using role play initiated by clinician) and/or had the supportiveness of parents and staff seemed especially frequent. Alongside the traditional methods for alleviating fear, children also need possibilities to use coping methods in which they have an active role giving them a feeling of some control over the environment and medical procedures.

3.7.4.3. Design Barriers

There are restrictions for flooring and possibly furniture, as the clinical environment means they must be easy to clean for the purposes of infection control. Similarly in the waiting room, however, these materials are available in a wide variety of colours and patterns as shown in many modern hospitals and practices. However, these options for existing practices are dependent on financial constraints.

3.7.5. Medical Equipment

Three areas were identified for discussion during analysis: the emotional reactions elicited in response to medical equipment, the aesthetic appearance of equipment versus the functionality of the equipment and explaining procedures with the use of rewards afterwards.

3.7.5.1. Emotional reaction

The result that parents of all age groups seem to feel neutral towards the aesthetic appearance of medical equipment and their child's emotional experience suggests that the requirement to design more aesthetically pleasing equipment may not be a high priority. In agreement with some of the healthcare professionals and medical equipment manufacturers,

parents may feel that the equipment is there to serve a function and the appearance is irrelevant. However, the appearance could be improved and still serve the same purpose.

Mirroring the results from the treatment room environment, the two younger age groups felt less anxious towards medical equipment compared to the two older age groups, and 15-18 year olds were the only age group to experience courage. This could once again be a result of the frequency of medical procedures in older children and young person's being higher than that of younger children. They are more likely to have experienced certain procedures and therefore able to predict a response (i.e. discomfort or pain as a result of an injection) leading to anxiety and tension. It is also possible that the experiences the older children and young persons have had have been negative experiences. Some procedures are known to cause pain and children whose previous pain experiences have been more intense or unpleasant have been reported to exhibit more subsequent distress than children whose experiences have been less intense (Rocha *et al.*, 2003, Bijttebier and Vertommen, 1998; Dahlquist *et al.*, 1986; Frank *et al.*, 1995). It is also thought that patterns of somatisation develop throughout children and remain fairly stable throughout adulthood (Garraalda, 1996). When children are young medical procedures are fairly unknown to them and their early medical experiences are going to be very significant and potentially shape their behaviour throughout childhood and into adulthood. This is why it is important that early experiences within healthcare should be as pleasant as possible. To reiterate a definition of pleasure, it can be thought of 'both as the elimination of, and absence of, pain and also as the provision of positive, joyful feelings' (Jordan, 2000).

An explanation for the courage felt by 15-18 year olds could be due to their higher level of cognitive development for reasoning. For example, they may be familiar with an action that causes discomfort (e.g. blood sample being taken) and feel anxious or tense but they can recognise the benefit of this action (identification of illnesses) and are able to let it be performed (experience courage).

The similarity of these results between the treatment room and medical equipment could be due to nature that one is generally always associated with the other. The use of medical equipment will only occur in a treatment room environment.

3.7.5.2. Aesthetic appearance versus functionality

The responses from all interviewees show the design of medical instruments tends to be functional, with little consideration for aesthetics. All interviewees expressed that they considered the use of colour and play to be of benefit using instruments with children.

Jordan (2000) argues that the emotional response to a product can be linked to product aesthetics such as their form or their colour.

The use of more colours could also be beneficial to all, not just children. An example used by Jordan (2000) is that of flying. Flying can be exciting for some, frightening for others. When sitting in confined area of a cabin for many hours, sitting still can be frustrating whether excited or frightened. With this in mind, colour schemes used in cabin interiors are typically chosen to reduce passengers' level of stimulation. Blue, a relaxing colour, is often used, as are pastel colours. It is unusual to see a cabin decorated in stimulating colour such as a bright red (Jordan, 2000). Potentially patients of all ages could benefit from the use of colour on medical instruments,

Although the use of colour and smaller sized instruments for children was mentioned by parents and healthcare professionals, the recognition that they are there to serve a function and the appearance of them isn't as important as long as they do what they are supposed to do is very much present. However, recent research has shown that the appearance of a medical instrument can impact on a child's emotional response towards it (Desmet and Dijkhuis, 2003; Reynolds and Lu Liu, 2010).

3.7.5.3. Explanation and reward

Not liking the look of a medical instrument, not having an explanation describing how it works or not receiving any feedback from the instrument can all contribute toward anxiety. As Jordan (2000) states, there are not only emotional benefits to psycho-pleasures but also through extending or enhancing people's cognitive capabilities. The feedback given by medical equipment (e.g. the display on an audiometer or blood pressure monitor) could seem complicated to a child or parent and they may not understand the purpose of the instrument. Providing more patient-friendly explanations and feedback from equipment could help ease anxiety and worries in both children and parents. If they are educated as well as being treated then the process may seem less daunting for them as they are more aware of what is happening and why.

The use of rewards after procedures involving a medical instrument was frequently mentioned by parents in a very positive way. Rewards are very well received by children and young persons and should be encouraged.

3.7.6. Survey and interview design limitations

3.7.6.1. *Demographics*

An explanation to the differences in response numbers for the survey according to child age could be due to parents with children of 0-4 years old more frequently visiting their primary care practice than older children. Children 0-4 years of age were found to visit their primary care practice more than any of the other age groups. This could be explained due to the numerous vaccines babies and toddlers tend to have in the early years of their childhood. Parents of children aged 15-18 years who had the lowest response rate out of the four age groups could be due to parents not always attending the primary care practice with their child once they reach mid-late teens as they are old enough to go on their own.

3.7.6.2. *Child self-report*

Similar to other studies, child self-report was absent. This was due to the aim of the survey which was to gather information on children from a very young age that would be unable to complete the survey themselves. In order to provide consistency throughout the survey, parents were required to complete the survey, even if their child was old enough themselves to complete it or visited their local practice without a parent. However, it was assumed that parents of older children were likely to ask their child to help them complete the survey.

3.7.6.3. *Question randomisation*

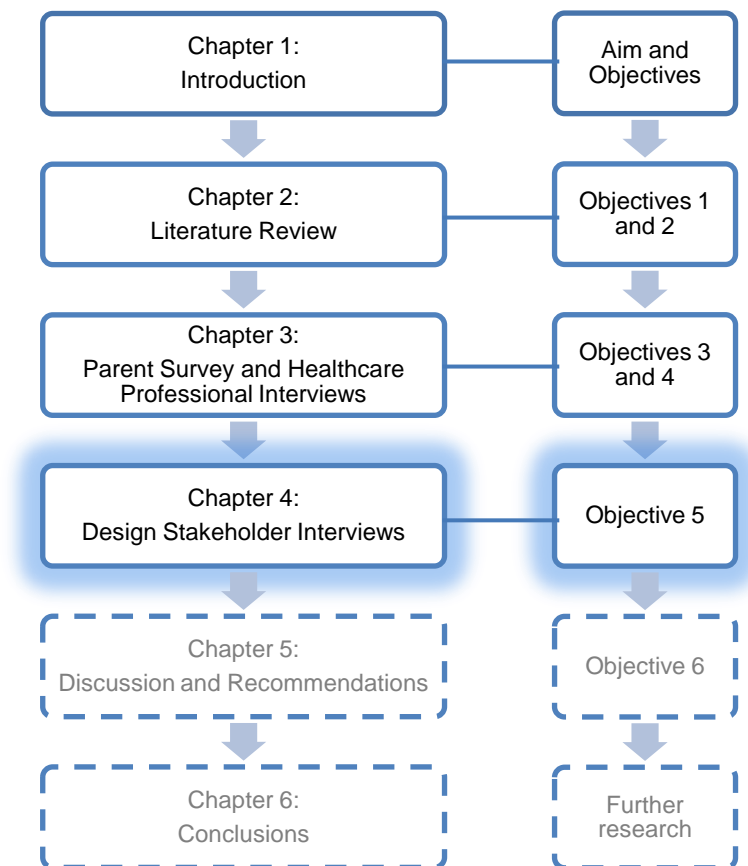
Question order was the same for each respondent, there was no randomisation of question order. Respondents may have paid more attention to the waiting room section which was presented earlier than to the medical equipment section which was presented later. Only 12 respondents skipped the waiting room section, opposed to 20 who skipped the medical equipment section.

3.8. Summary

- Secondary users (staff, parents) can influence children and young person's behaviour
- Waiting room environment:
 - Decor could be more child-friendly
 - Entertainment/distraction not ideal for a wide range of ages
- Treatment room environment
 - Decor could help provide a more relaxing environment
 - Distraction techniques are valued by both healthcare professionals and parents

- Medical equipment:
 - Aesthetic appearance may not have as large an impact as expected
 - Explanation and reward techniques were positively commented on
- Design barriers:
 - Clinical needs of environments
 - Resources available
 - Stakeholder input

Chapter 4: Design Stakeholder Interviews



4.1. Introduction

The study presented in this chapter was carried out in order to achieve objective 5:

- *Objective 5: Establish current design practices using design stakeholders*

This chapter is structured as follows:

- 4.2. Design stakeholder interview design
- 4.3. Results of design stakeholder interviews
- 4.4. Discussion of results

The research method chosen to help achieve objective 5 was that of semi-structured interviews. The reason was the same as in Chapter 3 where semi-structured interviews follow a set question guide but with flexibility to ask unplanned questions dependent on interviewee responses. An interview was also deemed the most thorough way of obtaining

the required information as, for this part of the research, the emphasis was on extracting detail from the intended interviewees.

Interviews of various design stakeholders (data source 3) helped enable the collection of information on current design practices (Objective 5) used in healthcare design projects or designing for children/young person's. The information collected along with the data collected in Chapter 3 helped form the basis of the design recommendations.

4.2. Design Stakeholder Interview Design

A semi-structured, focused interview schedule (Appendix 4.1) was designed for the extraction of information from design stakeholders about their experiences within their discipline regarding the design of healthcare environments of medical products. The same interview schedule (format and sequence of questions was used for all) but the questions were phrased and adapted according to the discipline/experience of the individual interviewee (architect or product designer, etc.).

The schedule begins with an introduction of the researcher and the research question, followed by some basic questions (section 1) to gather some basic demographics on the interviewee (Figure 4.1). They were asked for their occupation, their area of expertise, and how many years' experience they have.

Interview Schedule

Start with consent form and information sheet stating what will happen to the data etc.

Occupation/title/role: _____

Experience:

<input type="checkbox"/> Healthcare environments	<input type="checkbox"/> Healthcare products/instruments
<input type="checkbox"/> Product design for children	<input type="checkbox"/> Environment design for children
<input type="checkbox"/> Architecture (healthcare)	<input type="checkbox"/> Architecture (child related, i.e. school)
<input type="checkbox"/> Interior Design (healthcare)	<input type="checkbox"/> Interior Design (child related)
<input type="checkbox"/> Research	<input type="checkbox"/> Other (please specify)

How many years experience do you have as a practitioner? _____

Figure 4.1. Extract from design stakeholder interview schedule showing demographic questions

The following section formed the main body of the interview. It was divided in to two parts. The first part involved questions on healthcare design and designing for children (Figure 4.2). They were asked to give some examples of projects they have worked on followed by questions on the flexibility/rigidity of the briefs for these projects. They were then asked if, in their opinion, designs (whether environment or product) can be adapted to suit people of different ages and if so, how they do this. They were asked questions on what design decisions are based on, how they design for specific ages, how much consideration goes in to the aesthetic appearance (of an environment or product) and whether emotions or the developmental level of a user group is considered.

- Healthcare design and designing for children
- Examples of projects have you worked on? *(regards their experience stated above)*
 - o *Ask for a couple of examples*
 - o *How have any of these projects included design for children and/or healthcare environments?*
 - How flexible or rigid are the design briefs you've had?
 - o *Do the design briefs tend to be purely functional? Product/environment serves a function and that is all it is to be designed for?*
 - o *Legislation/policy restrictions?*
 - In your view, do you think it is always possible to adapt designs for different ages?
 - o *How do you adapt designs for different ages?*
 - o *How do you come to design decisions for products/environments aimed at different ages?*
 - o *What do you do differently for a product/environment aimed at toddlers, compared to a product aimed at teenagers?*
 - *Colours, textures, materials*
 - *Different levels of development and understanding*
 - *Do you take into account the types of feelings/emotions the target sample are likely to feel in response to products/environments?*
 - o *How much consideration goes in to the aesthetic appearance of product/environment (interior design)?*
 - *Colours, textures, materials*
 - o *RE architecture: is age a consideration at all when designing a building/environment? RE healthcare: Do they incorporate people of all ages? Do they allow for children in these designs?*
 - *Children of different ages have different levels of development and understanding toward healthcare – are these considered?*

Figure 4.2. Questions from designer stakeholder interview schedule about healthcare design and designing for children

The second part involved questions on the types of resources, tools and processes the interviewee had experience with using (Figure 4.3). They were questioned on what they have found works well, how much input other stakeholders have, and on what the main barriers are that they face during design projects.

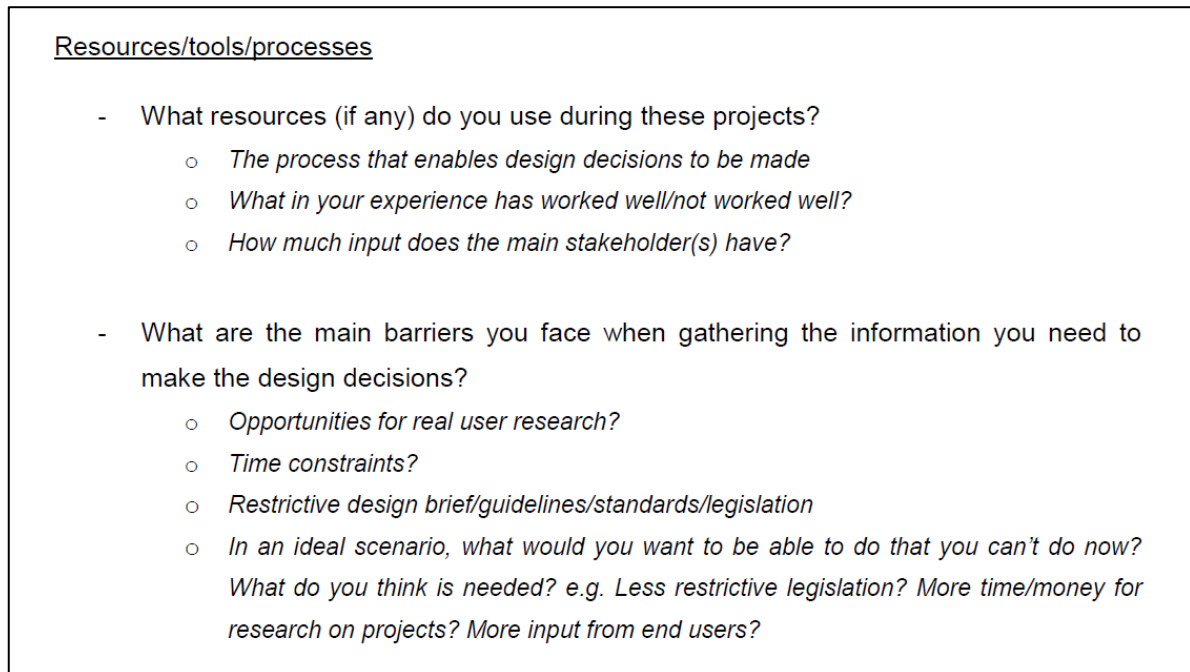


Figure 4.3. Questions from designer stakeholder interview schedule about resources, tools and processes

4.2.1. Sampling Strategy

The target sample of stakeholders was professionals with involvement in the design processes of primary care environments and medical instruments. In addition to these, due to the findings of the parent survey where the staff were identified as the most important aspect of a practice regarding children's emotional experience, 'staff training' was added to the design areas to be examined. The design stakeholders directly associated with primary care practices are illustrated in Figure 4.4. In addition to these stakeholders, designers that have experience designing products or environments for children and young persons were also included. The design stakeholders to be targeted for interviewing were:

- NHS practice staff (e.g. practice managers, administrative staff)
- Healthcare Architects/Interior Designers
- Children's (incl. young person's) Environment Designers
- Product Designers (medical or children)
- Researchers (in any of the above disciplines)

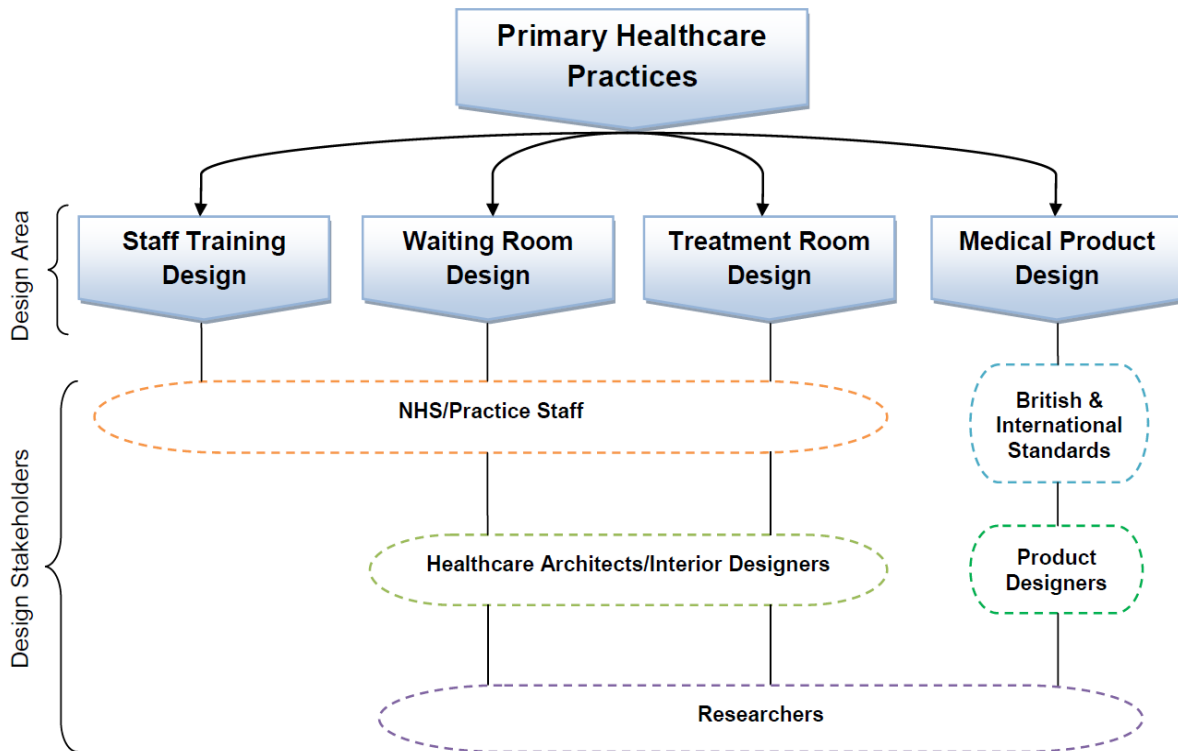


Figure 4.4. Design stakeholders within primary care practices

The stakeholders were accessed using opportunity sampling, for example, known to the researcher or through contacts. Stakeholders were also accessed using the professional networking website ‘LinkedIn’. They were approached via email to provide an information sheet that explained the detail of the research being conducted and why they were being approached (Appendix 4.2). If the healthcare professional agreed then an interview was arranged. The interviews were conducted face-to-face wherever possible or electronically through a series of emails if the interviewee was unable to meet in person. A consent form was signed (Appendix 3.4) or written consent given (if email was used) prior to any interviews. The interviews ran from February to April 2012.

4.2.2. Interview Analysis

The interviews were analysed in a similar manner to the healthcare professional interviews. Each interview was transcribed and analysed using thematic coding. The responses were analysed according to question category:

- Design brief, processes and resources
- Age inclusive design (designing for different ages and age consideration)
- Design barriers

For example, all responses to the questions regarding design briefs were analysed together, codes of data were created and then grouped in to themes. Each question category resulted in having a set of themes. The analysis did not involve a software programme such as Nvivo but was done by hand and formatted using Microsoft Excel.

Data from nine of the ten interviewees were analysed in this manner. The final interviewee was an independent consultant and a Fellow at the Royal Society of Medicine whose background was different. This interviewee was interviewed for their experience with the psychosocial element of design projects and the questions asked were different. The questions were grouped into categories but the responses analysed in order to gain an insight in to psychosocial design.

4.2.3. Ethical Approval

Ethical approval for the interviews was sought by completing Loughborough University's Ethical Clearance Checklist which was approved by Loughborough University's Advisory Committee.

4.3. Results

The data from the interviews are presented in subsections 4.3.1 – 4.3.3. Table 4.1 contains the information from all ten interviewees including their occupation, their relevant experience and example projects. All interviewees will be referred to by their interviewee reference number throughout analysis. Tables containing all quotes from the interviewees can be found in Appendix 4.3.

Table 4.1. Demographics of interviewees

Key: RC = Researcher (children’s design), RM = Researcher (medical product design), A = Architect, D = Designer, M = Manager, C = Consultant

Interviewee	Occupation	Experience	Example projects
RC1	Children's product design researcher/research associate	product design for children, healthcare products	Lecturer - designing for children, evaluation work on designing products for children, work with HSE, product evaluations from safety perspective, inclusive design research - 10 years' experience inflatable play pens for children, furniture for schools – plastic chair for schools, evaluation work of domestic air fresheners from safety perspective of children.
RM1	Medical product design/designing for teenagers/research associate	product design for children, healthcare products, research	Case study of cystic fibrosis physiotherapy device, development of assessment tool to elicit adolescent’s priorities (AMDAT), design requirements for adolescents.
A1	Architect	healthcare environments, healthcare architecture, healthcare interior design, environment design for children, architecture for children	NHS LIFT Primary Care Centres in Leicestershire and Southern Derbyshire, together with Acute Healthcare for Children and Young Adults.
A2	Medical planner / architect	healthcare environments, healthcare architecture	Inpatient hospitals for academic medical centres that include paediatric hospitals or centres within the main hospital (UCLA Ronald Reagan Medical Centre/Mattel Children's Hospital, Hackensack Medical Centre Women's and Children's Pavillions, New York University Medical Centre Kimmel Pavilion and the NYU Medical Centre Emergency Department Expansion as well as many other healthcare projects.
A3	Principal design architect	healthcare environments, healthcare architecture, healthcare interior design	Several paediatric medical offices for private physicians.

Interviewee	Occupation	Experience	Example projects
A4	Principal health facility architect	healthcare environments, healthcare interior design, research	The Women's and Children's Hospital at the Canberra Hospital , ACT, Australia, The Bankstown Women's and Children's Community Centre NSW, Australia, Chatswood Community Health Centre for Children and Adults, Chatswood, NSW, Australia.
D1	Senior interior designer / planner	healthcare environments, healthcare interior design	Two 6 Storey Outpatient Centres (Paediatric) new construction on hospital campus for same client, Paediatric Emergency room remodel and expansion, 11 story Inpatient/Outpatient Paediatric/Adult hospital expansion, Paediatric Outpatient Surgery centre, multiple Paediatric Outpatient clinics.
D2	Senior medical planner	healthcare environments, healthcare architecture, healthcare interior design, architecture for children	550 bed hospital replacement (180 beds women's and children's). 350 bed not for profit hospital, 980 bed foreign public hospital, including 280 long term beds, multiple ambulatory care facilities, including paediatric ambulatory care.
M1	Practice manager (Leicestershire and Rutland NHS Trust)	healthcare environments, healthcare interior design	Involvement in the design of a new GP practice in Loughborough (Leicestershire and Rutland NHS Trust).
C1	Independent consultant and Royal Society of Medicine Fellow	healthcare environments, healthcare products, interior design	Arriva trains staff mess rooms, Phillips consumer electronics, NHS Choices, project analysing the interaction between bus drivers and mobility challenged passengers.

4.3.1. Design processes and resources

The interviewees were asked about the design processes they had used in previous projects. The questions focused on whether they considered the briefs to be rigid, restrictive or flexible, functionally based and how much user involvement is (if at all) encouraged. They were also asked what processes and methods they had used on past projects and stakeholders input. Two themes were identified during analysis of the responses. These were 'stakeholder input' with two main subthemes and 'requirements' also with two subthemes (Figure 4.5).

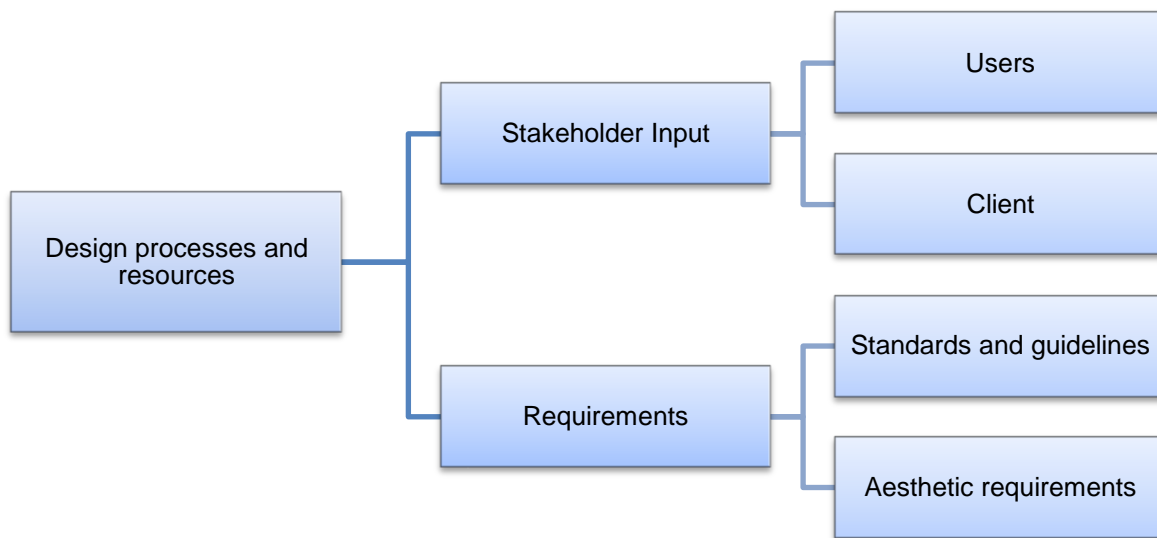


Figure 4.5. Design processes and resources themes and subthemes

4.3.1.1. Stakeholder input

All nine interviewees were able to discuss the involvement of users, whether it be the inclusion of users in the design process or the lack of. All but one of the nine interviewees was able to make a positive comment about having users (or user specialists) participate to some extent in healthcare design processes. For example:

A4: 'In general the brief has been technical but in discussion with users and key senior personnel the design intent is developed and documented in the brief'

D2: 'We work hand in hand with our users to understand their work process, not just to remake it in a new facility, but to move through the process from that baseline and bring them into a new environment with an improved care/work process'

However, although it seems user involvement was present to a certain degree in most projects the interviewees had worked on; it was not always to the extent to which they would have liked:

A1: *'Access to patient groups is not always available'*

A4: *'Not often the users are true representatives of the whole operational group'*

D1: *'It is very rare that there is time or money to invest in design sessions with end users'*

User involvement or at least some user consideration through the use of specialists appears to be present either as a resource during the design of the brief or as a resource during the design process. But the involvement of end users also appears to be lacking with some user groups not being accessible possibly due to time or money constraints of projects or due to the client's brief not allowing for any user involvement.

Client input also appears to vary across projects. From the interviews it seems that it is very project dependent on whether it is the client with the money driving the designs or whether it is collaborative between the client and the designer, or the client, designer *and* user:

A2: *'If the main stakeholders are the department leaders, they have a lot of input'*

A3: *'The main stake holders have a lot of input, but they are not always the right stake holders'*

Some design stakeholders have had good collaboration with their clients. However, there is the opinion that the clients are not always the best stakeholder to have such a large input; there is consensus that there is arguably not enough end user input in projects.

4.3.1.2. *Requirements*

Standards and guidelines will always form part of a design brief and when discussing design briefs and processes, standards and guidelines were mentioned by six out of the nine interviewees:

A2: *'Of course there are regulatory standards that we must adhere to'*

M1: *'Well increasingly their biggest governing, over arching view of what a GP consulting room looks like is the care quality commission and the standards that they will expect us to hit and we have to register to show compliance'*

The compliance with standards was discussed more than any aesthetic requirements of users. Only three out of the nine interviewees made reference to aesthetics requirements:

A2: *'A parallel process of developing design goals that revolve around patient experience, staff experience and aesthetic goals'*

M1: *'Our strategy in the new waiting area, is for it to be relaxed, very clean, very smart looking'*

Providing a design that meets standards and functional requirements appears more prevalent than any aesthetic requirements. Given the nature of the design briefs in healthcare this would be expected as the main priority is to provide a healthcare service. However, research has brought to light the importance of aesthetic elements to environments and the benefit of these to people's well-being. This will be discussed further in section 4.4.

4.3.2. Age inclusive design

This section of the interview asked the interviewee whether they thought it was possible to adapt a design (either a refurbishment or new design) for users from a wide age range. They were asked how they would adapt designs for people of different ages and whether they take into consideration the different levels of cognitive and physical development. Two themes arose: (1) 'designing for children and young persons' with two subthemes; (2) a general theme about personal views and opinions on design that is inclusive of different age ranges drawn from their varying experiences (Figure 4.6).

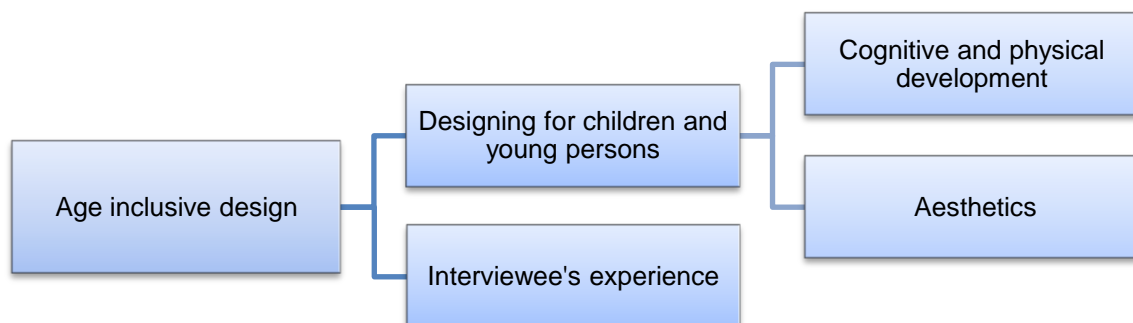


Figure 4.6. Age inclusive design themes and subthemes

4.3.2.1. *Designing for children and young persons*

There was recognition of the cognitive and physical differences between user groups of different ages amongst the interviewees with five of nine interviewees identifying for differences between children and adults. For example:

A2: *'One must also take into consideration emotional and physical maturity and challenges of a specific group. This will help to guide decisions about how much and what type of sensory stimuli will best help the patient heal, what will help them make sense of their environment and what will help them take feel in control and comfortable'*

The interviewees were questioned on what they do differently when designing for children or young persons compared to when designing for adults. They discussed aesthetic considerations such as colour, materials and texture when designing for a younger user group:

D1: *'Smaller children also love to experience different textures and teens typically like to visualize these textures'*

C1: *'...there was a lot of effort that went in to calming patients using colours and soft forms'*

There appears to be a good awareness of the different needs of younger user groups amongst these design stakeholders. It is not known, however, whether this knowledge has been implemented into healthcare designs other than child specific environments such as paediatric hospital wards. It also not known whether medical device designers use this knowledge when considering the design of devices and equipment.

4.3.2.2. Interviewee experience

There were mixed views on whether an environment or device suitable for a wide range of user age groups could be achieved due to the differing cognitive needs and levels of understanding. For example, some did not agree an environment can accommodate all ranges:

RC1: *'I think in my opinion you can only design for specific age ranges'*

A3: *'Certain designs are never adaptable nor necessarily appropriate for all ages', 'Design for different ages in waiting rooms for instance takes on a challenge'*

However, others thought that accommodating a wide range of ages was achievable through careful design planning:

D1: *'It can be achieved by strategically placing design elements. This is key in any paediatric environment as many practices see age ranges from 0 – sometimes 19'*

D2: *'We can accommodate the needs of paediatric, adult and geriatric population within the same area requirements, but the character of that space is essentially different'*

Providing an environment to encompass the needs of a wide variety of users appears to be a very challenging task. The general consensus was that it is very difficult to provide for children and young persons while still trying to provide a suitable environment for the adult and geriatric users.

4.3.3. Design barriers

All interviewees were asked about the main barriers (any element that placed restrictions on what could be done) they felt they faced when gathering information for design decisions and about the opportunities for end user research. Two themes were identified: 'resources' with two subthemes and 'input' with two subthemes.

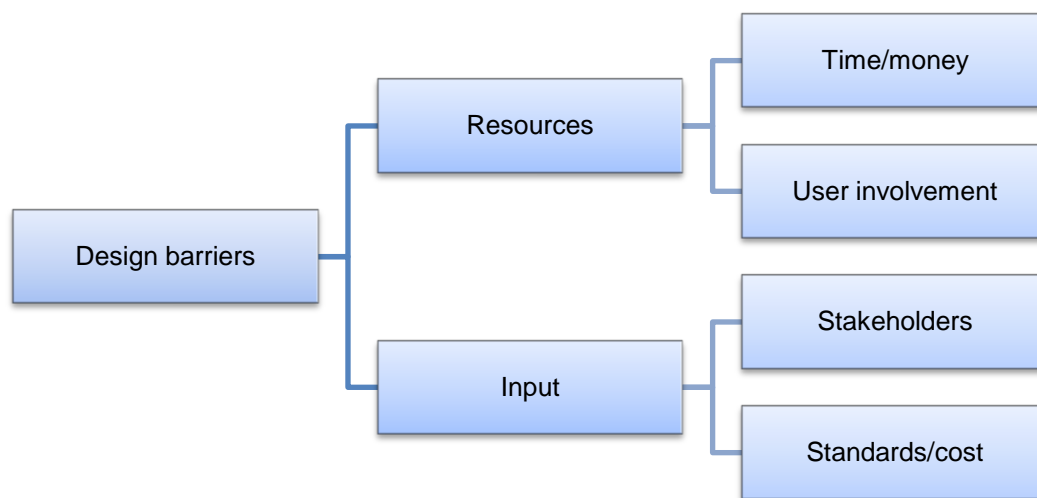


Figure 4.7. Design barriers themes and subthemes

4.3.3.1. Resources

The majority of the interviewees made reference to either time or money as a main barrier to a design process:

A2: 'Time and money are always an issue and probably the biggest issue'

A3: 'Time and money are the biggest constraints'

The strict schedules and budgets provided an explanation for the lack of end user involvement in many projects as many design stakeholders given the choice would welcome more user involvement:

A1: 'I think what leads to a successful design response, is greater end user engagement, greater allowance for design development (with appropriate fee allowance)...'

Time and financial budgets seemed to play a large part in the decision to involve end users in the design process. User involvement appears to be a low priority when budgets were strict:

A4: *'They want this to be done quickly and don't really expect to have research undertaken in the project time'*

4.3.3.2. Input

Certain stakeholders placed restrictions on user involvement rather than time or financial issues:

A2: *'In many instances, the hospital administration is not willing to listen to input from patients'*

Most client stakeholders have the final decision over design decisions, whether user research has been conducted or not:

C1: *'...ultimately it's them that are going to make the decision on what they're going to do. They let you suggest fairly openly but it's up to them what they're going to do'*

The other main restrictive input is legislation and the standards that must be adhered to within healthcare. These are important to reduce the risk of infection and keep safety risks to a minimum but can also place restrictions on what architects and designers are able to do:

RM1: *'I think the legislation probably is a bit of barrier'*

D2: *'Institutions that are very restrictive about their purchasing agreements and standards are difficult, because they leave potential solutions aside'*

4.4. Discussion

The analysis of the interviews identified some key areas for discussion regarding current design practices:

- Client stakeholder input
- Time and money constraints
- User research (appropriate user group research, age group differences)
- The design brief and standards
- Design stakeholder input (architects, interior designers, etc.)

Figure 4.8 demonstrates how these five areas interlink and influence each other. The arrows illustrate the direction of influence, for example, the client/s influence on the brief, time and money and user research.

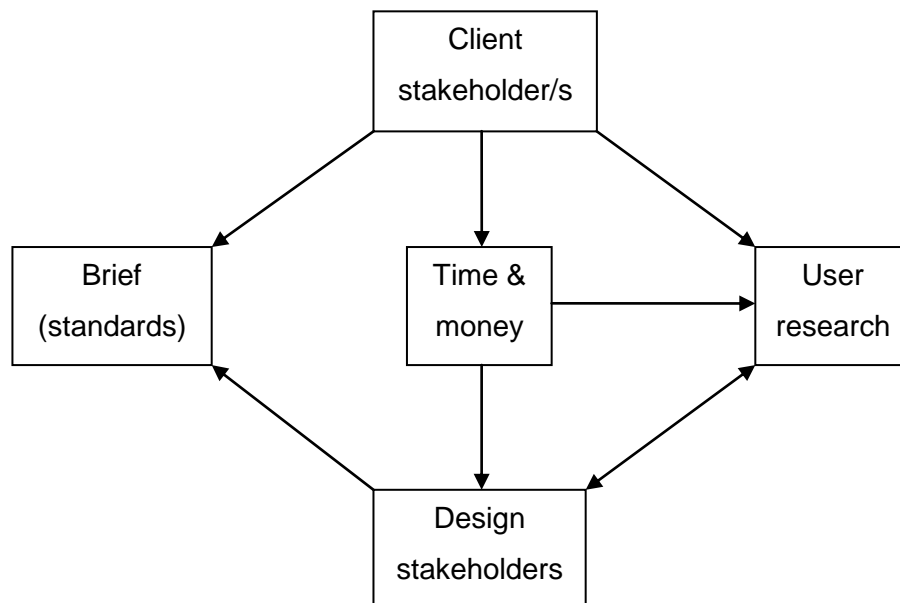


Figure 4.8. Key elements and influencers in the design process

4.4.1. Client stakeholder input

The main driving force behind the design process tends to be the client stakeholder. They control the financial budgets and time scales which ultimately controls how the design is managed. The challenge from the designer's perspective appears to be effectively communicating their philosophies for user research and more creative design concepts to the client stakeholder. The clients have a large part to play in how much end user research takes place as this takes up both money and time.

4.4.2. Time and money

These elements of a design brief seem to place the highest constraints during the design process. They impact on the availability to perform end user research which in turn impacts on the flexibility of design options. Communicating a new concept to client stakeholders would require supportive evidence, and this would be best in the form of end user approval. Understandably there are always going to be limited budgets within healthcare projects that place constraints on certain aspects of the process, namely user involvement.

4.4.3. User research

User research can take many forms: using research from a previous project, user specialists, proxy groups, immersion techniques and actual end user engagement. The majority of interviewees expressed their appreciation and the importance of involving end users in the design process. However, they also expressed that they do not always get this opportunity agreeing with McCormick and Shepley (2003) that the main communication tends to be between designers and clients with a lack of consumer (end user) involvement in healthcare design processes.

The variation in end user involvement in projects seems to primarily stem from the client stakeholder. They control the financial and time budgets and, collaboratively with the designers, the design brief which will dictate what research is conducted.

4.4.4. The design brief and standards

The adherence to standards was mentioned as a main element in healthcare design briefs. There are two standards from the Care Quality Commission's essential standards of quality and safety (Care Quality Commission, 2010) that applies to primary care practice environment design which are 'cleanliness and infection control' (Regulation 12 of the Health and Social Care Act) and 'safety and suitability of premises' (Regulation 15 of the Health and Social Care Act). As can be seen in Figure 4.9 and Figure 4.10 these standards do not stipulate specific design requirements such as certain layouts or materials. It is presumed the architects and designers input from their own experience and knowledge what designs, layouts, furniture etc., are the most suitable for healthcare environments. The non-specific nature of some of these standards could arguably allow for vast flexibility within healthcare design. For example, Regulation 15 (a) states just a 'suitable design and layout'. Alternatively, however, due to a lack of stringent guidance, this might lead designers into following the safe, traditional healthcare facility design that has emphasised only the functional efficiency from a pathogenic perspective (i.e. reduction of infection or disease risk exposure) (Ulrich, 2001) as opposed to venturing in to new potential solutions that encompass a more holistic approach (i.e. psychological needs as well as physical).



What do the regulations say?

Cleanliness and infection control

12.—(1) The registered person must, so far as reasonably practicable, ensure that—

- (a) service users;
- (b) persons employed for the purpose of the carrying on of the regulated activity; and
- (c) others who may be at risk of exposure to a health care associated infection arising from the carrying on of the regulated activity, are protected against identifiable risks of acquiring such an infection by the means specified in paragraph (2).

(2) The means referred to in paragraph (1) are—

- (a) the effective operation of systems designed to assess the risk of and to prevent, detect and control the spread of a health care associated infection;
- (b) where applicable, the provision of appropriate treatment for those who are affected by a health care associated infection; and
- (c) the maintenance of appropriate standards of cleanliness and hygiene in relation to—
 - (i) premises occupied for the purpose of carrying on the regulated activity,
 - (ii) equipment and reusable medical devices used for the purpose of carrying on the regulated activity, and
 - (iii) materials to be used in the treatment of service users where such materials are at risk of being contaminated with a health care associated infection.

Regulation 12 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 4.9. Cleanliness and infection control

Regulation

What do the regulations say?

Safety and suitability of premises

15.—(1) The registered person must ensure that service users and others having access to premises where a regulated activity is carried on are protected against the risks associated with unsafe or unsuitable premises, by means of—

- (a) suitable design and layout;
- (b) appropriate measures in relation to the security of the premises; and
- (c) adequate maintenance and, where applicable, the proper—
 - (i) operation of the premises, and
 - (ii) use of any surrounding grounds,

which are owned or occupied by the service provider in connection with the carrying on of the regulated activity.

(2) In paragraph (1), the term “premises where a regulated activity is carried on” does not include a service user’s own home.

Regulation 15 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 4.10. Safety and suitability of premises

Regarding medical equipment used in primary care practices, the standard from the Care Quality Commission referring to equipment is that of Regulation 16 of the Health and Social Care Act ‘safety availability and suitability of equipment’ (Figure 4.11). This regulation refers mainly to the maintenance, appropriate use, and the protection of users from any unnecessary discomfort. There is no reference to the design of the equipment or different user groups. Children and young persons are particular user groups that are susceptible to the design of medical devices and equipment due to their lack of understanding of healthcare procedures. Perhaps the suitability of medical equipment regulation should include using the most suitable equipment for the individual user, whether that is in reference to shape, size or appearance of medical devices and equipment.

Regulation

What do the regulations say?

Safety, availability and suitability of equipment

16.—(1) The registered person must make suitable arrangements to protect service users and others who may be at risk from the use of unsafe equipment by ensuring that equipment provided for the purposes of the carrying on of a regulated activity is—

- (a) properly maintained and suitable for its purpose; and
- (b) used correctly.

(2) The registered person must ensure that equipment is available in sufficient quantities in order to ensure the safety of service users and meet their assessed needs.

(3) Where equipment is provided to support service users in their day to day living, the registered person must ensure that, as far as reasonably practicable, such equipment promotes the independence and comfort of service users.

(4) For the purposes of this regulation—

- (a) “equipment” includes a medical device; and
- (b) “medical device” has the same meaning as in the Medical Devices Regulations 2002.

Regulation 16 of the Health and Social Care Act 2008 (Regulated Activities) Regulations 2010

Figure 4.11. Safety, availability and suitability of equipment

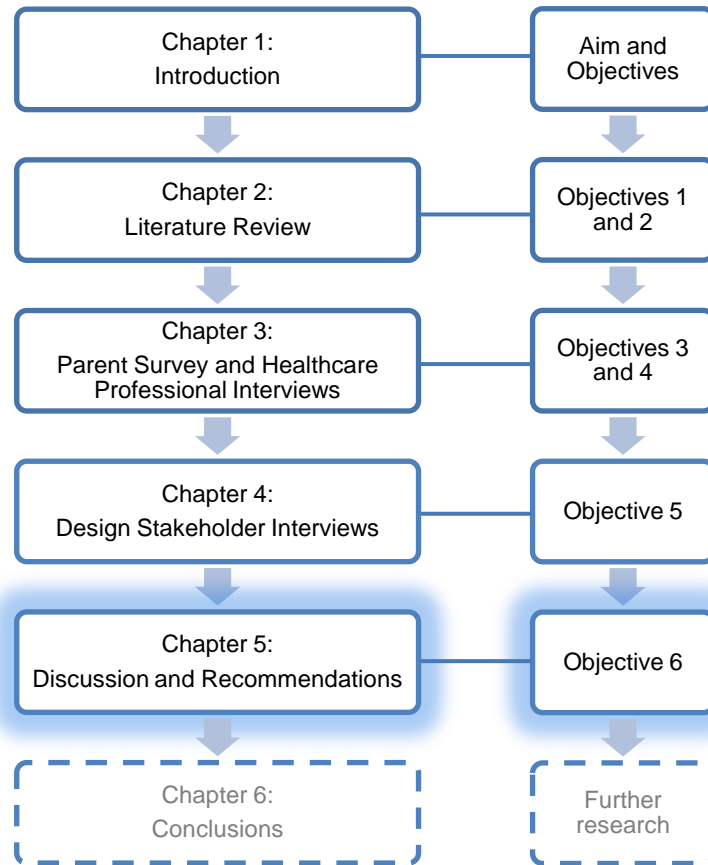
4.4.5. Designer input

Designers (including architects, interior designers and product designers) appear to have some control over design decisions throughout the process and communicate well with the client (McCormick and Shepley, 2003). The types of designers involved in healthcare design tend to be those with previous experience within healthcare and familiarity with the regulations. It was not established through the interviews, however, whether this meant designers tended to stick with what they knew about healthcare environments and products with reluctance to change or whether they were open to new design solutions and challenging the boundaries of traditional healthcare design.

4.5. Summary

- Care Quality Commission regulations have to be adhered to, but are more available as guidelines
- Client stakeholder requirements can place constraints on the design brief, namely:
 - Time
 - Money
 - User research
- Designers tend to follow traditional healthcare design

Chapter 5: Discussion and Recommendations



5.1. Introduction

This thesis has investigated the experiences of children and young persons with primary care. It has also explored the experiences of healthcare professionals and the role of design stakeholders in primary care design processes.

This chapter is structured as follows:

- 5.2. Discussion and recommendations
- 5.3. Commercial feasibility
- 5.4. Relevance to industry
- 5.5. Contribution to knowledge

The specific findings of each study were discussed at the end of each chapter. This chapter will discuss the research findings obtained through triangulation of analysis methods and

data sources in the context of the literature and where there are similarities, design recommendations have been made for new and existing practices. Where there are no similarities between the findings and literature or there was limited literature for comparison, a recommendation for future research has been made. This chapter also discusses commercial feasibility, relevance to industry and contribution to knowledge.

5.2. Discussion

The main discussion points from Chapter 3 and Chapter 4 have been summarised and grouped in Figure 5.1 to show factors contributing to a child or young person’s primary care experience. The blue box represents physical design factors and the purple box service design factors. The green boxes contain the individual factors associated with the physical and service design factors.

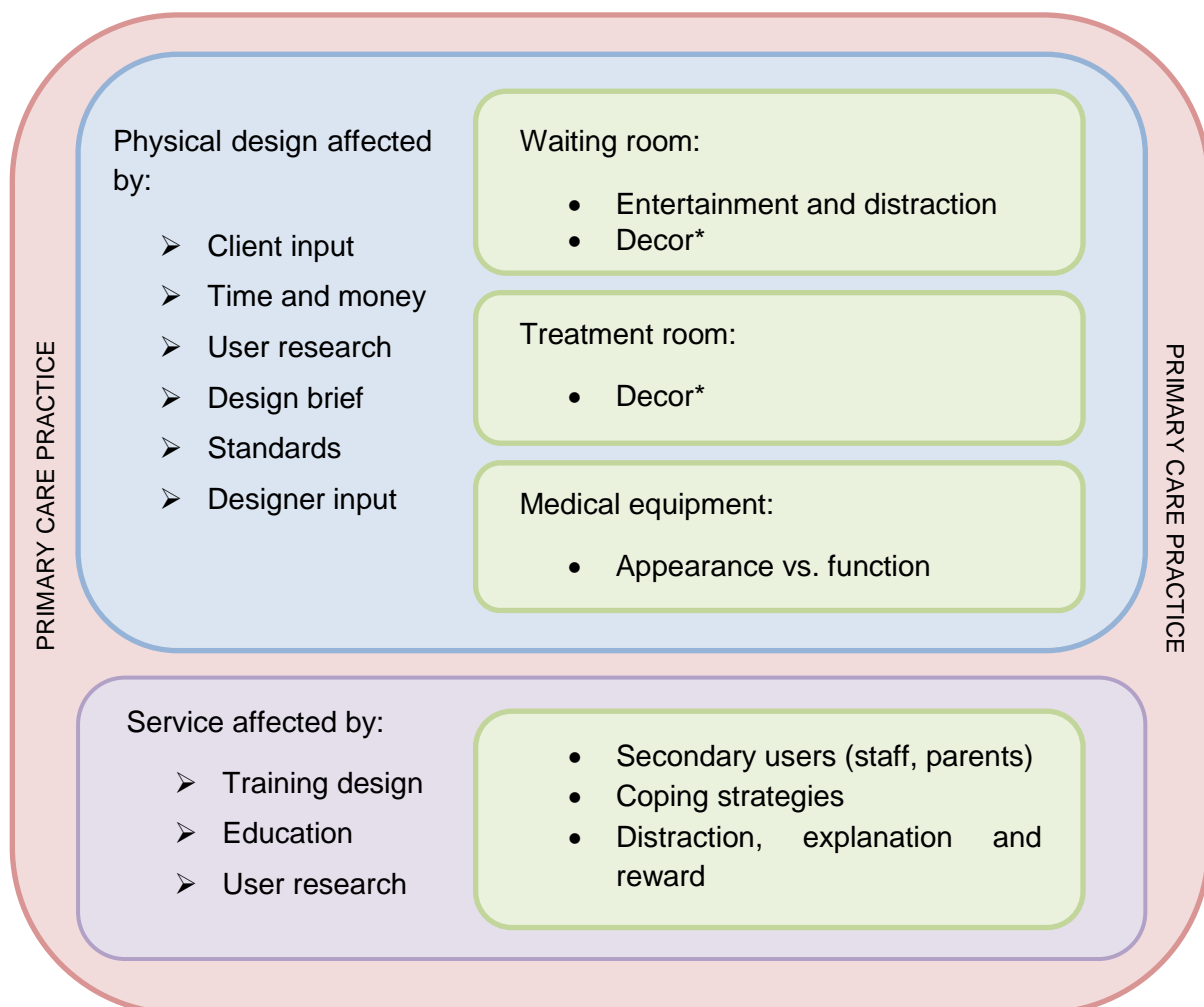


Figure 5.1. Physical design and service design factors affecting children and young person’s experiences in primary care practices (* Decor refers to aspects of the physical environment such as furniture, layout, wall colour, floor material and colour, posters, pictures, plants, lighting, etc.)

The factors contributing to children and young person's primary care experience can be seen in Figure 5.2. There are four main contributing factors, each with different elements influencing them. The arrow size and density attempts to represent the influence that factor has on a child or young person's experience, based on this research.

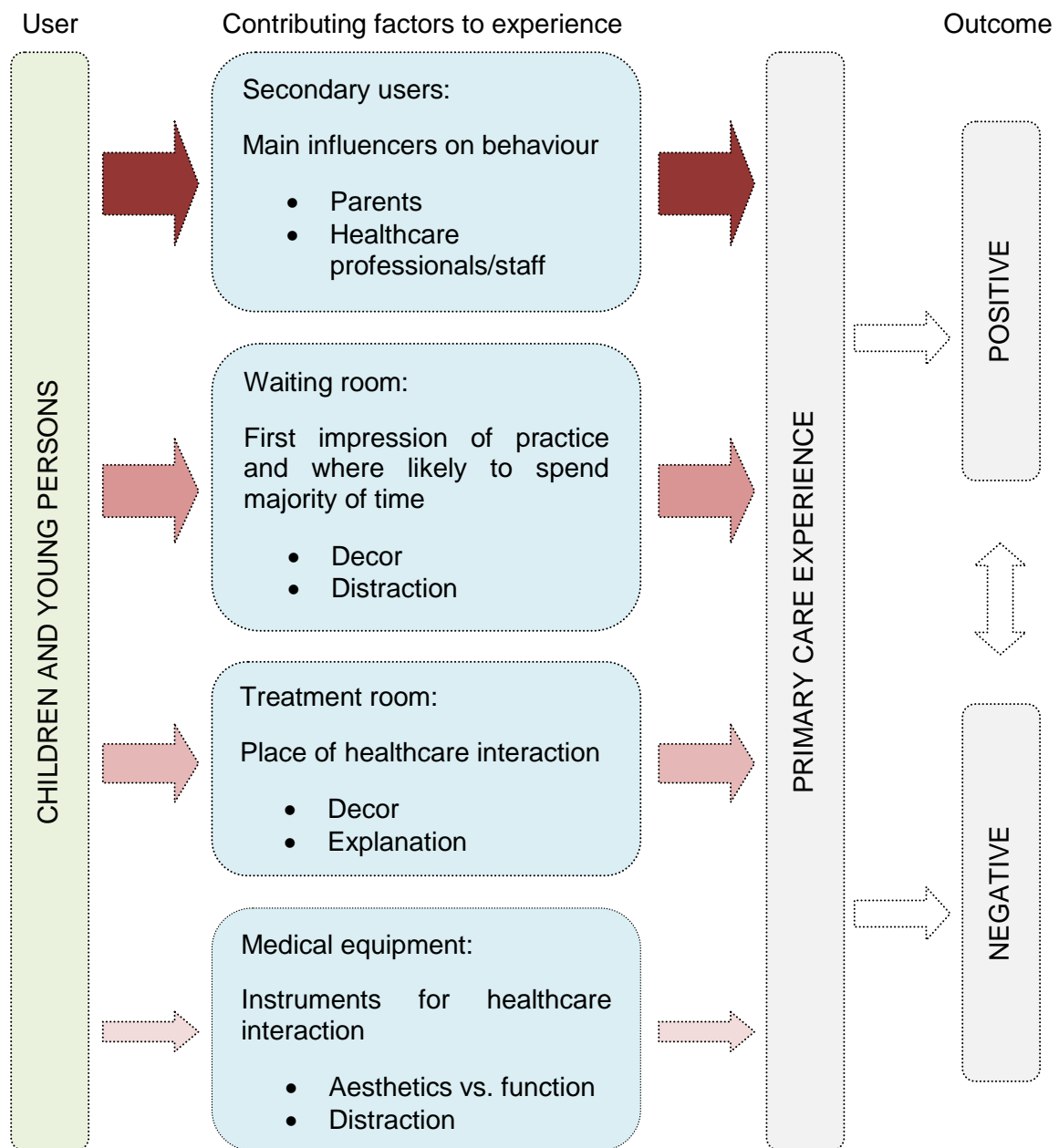


Figure 5.2. Factors contributing to children and young person's primary care experience

Figure 5.2 demonstrates the importance that other users have towards children’s and young people’s experience at a primary care practice. The interactions between all users are illustrated in Figure 5.3.

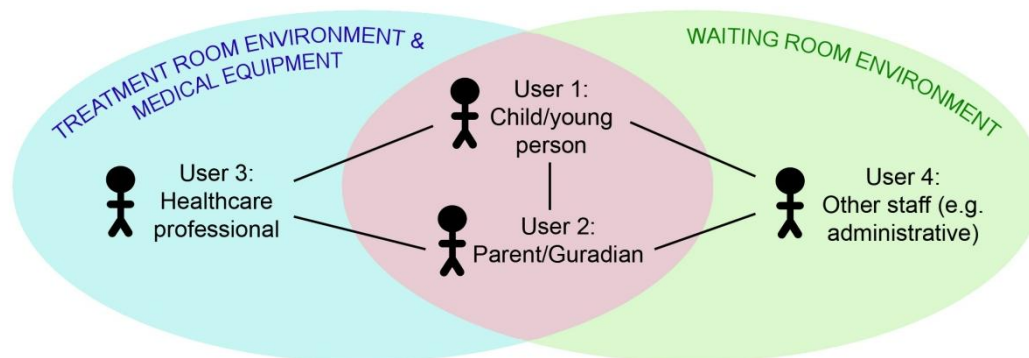


Figure 5.3. Diagram demonstrating the interaction between users at a primary care practice

5.2.1. Secondary users: Parents

The secondary users appear to be the most influential factor in children’s and young person’s primary care experiences. The behaviour of secondary users, such as parents is likely to be a direct effect of their own view of healthcare and healthcare processes. The design of a service for patient interaction has as much, if not more, of an impact on users as the physical result (environments/equipment) of a service. Children and young persons are users of primary care as frequently as adults (Attribution dataset GP registered populations scaled to ONS population estimates, 2001), but children are not ‘little adults’. Different patients have different needs due to cognitive, physical, social and emotional development levels, especially children (Price, 1994).

As can be seen in Figure 5.1, part of the secondary user impact are the coping strategies with explanation and reward. Worry in children is ‘predominantly self-referent’, worrying about threats to their well-being (Borkovec *et al.*, 1983; Hertzog and Farber 1999) and so the way they learn to cope in healthcare situations is especially important. Younger children in particular are also more susceptible to stress caused by illness because of their limited understanding of illness and its causes. It has been suggested that parental behaviours may represent attempts to influence their children (Kopp, 1982) this was evident in the healthcare professional interviews (sections 3.7.4 and 3.7.5). Interviewee 1 stated ‘*parents who react badly themselves to such situations pass these feelings directly and indirectly to their children*’ and ‘*some children are clearly ill behaved that the parents do nothing about*’. This coincides with the findings of Rocha *et al.* (2003) that maternal responses were a strong

predictor of somatisation and pain reactivity in the child and mothers of children who exhibited a stronger response to a vaccination were more likely to interact with their child during the procedure. This helps provide further evidence that parents have a large impact on their children's reaction to healthcare and perhaps *'parents and carers need more education about their child in healthcare environments'* (Interviewee 3).

Although not a direct link with physical design, the design of educational material for parents is a part of the primary care service. As parents were identified in the literature and healthcare professional data as having potential adverse effects on their child's behaviour, the following recommendation has been made.

Design recommendation (1): To provide advice and information for parents on helpful behaviour and effective coping strategies for their child/ren when using primary care services.

Information and advice should be provided to parents on the importance of their own behaviour in front of their children while visiting primary care practices. It could be beneficial to provide advice on positive behaviour, even if they are feeling anxious as their behaviour can influence their children unintentionally. They should be informed why this important to their child's experience and how speaking positively and preparing their child for healthcare visits and educating their child from an early age can be important. Currently there is internet-based information available about preparing a child for hospital or surgery (including online parenting networks) but this information is primarily directed towards secondary healthcare. This information is only available for those who actively search for it and have access to the internet. As an alternative, informative posters could be placed around practices, or leaflets given out by staff on arrival or in waiting rooms.

5.2.2. Secondary users: Healthcare professionals

The behaviour of a secondary user such as a clinician or another healthcare professional or staff member towards children and young person's is likely to be down to a mixture of training and personality. In the survey parents reported on their negative experiences of healthcare professionals as being *'impatient'*, *'unfriendly'*, *'not addressing child directly'* and *'not explaining things'*. They also reported positive experiences as having *'friendly receptionists'*, *'positive relationships with staff'*, *'staff engaging with children'*, *'distraction during procedures'*, *'rewards'* and *'listening and explaining things to child instead of parents'*. These were all things that parents reported as valuing highly in a healthcare professional.

There was little literature available on healthcare professional behaviour with respect to children's and young person's healthcare experiences, especially in primary care. Research

has been conducted on healthcare professional behaviour, but mainly in secondary care. There are, however, books available such as 'The textbook of children's nursing' (Moules and Ramsey, 2004) and 'A textbook of children's and young people's nursing' (Glasper and Richardson, 2005) which include information on the developmental differences between children and what healthcare means to them. This kind of material, although aimed toward secondary care, could be beneficial for primary care professionals. If further research found this was a contributing factor to children and young person's healthcare experiences, standardised training could be made available for all primary care staff (receptionists, nurses, GP's, etc.) for working with younger patients under the age of 18 to consider the cognitive, social and emotional differences between ages.

Therefore, the following recommendation for future research has been made.

Future research recommendation (1): To explore and understand healthcare professional's behaviour towards children and young person's and the relationship to their healthcare experiences. To investigate training methods that incorporate 'best practice' for interactions with young patients in primary care.

If further research were to find that the healthcare professional's relationship and behaviour with children and young people can help improve their healthcare experience, an effective method of educating healthcare professionals would need to be established, however. Foy, Eccles and Grimshaw (2001) identified that research cannot change patient outcomes unless health services and healthcare professionals adopt them in practice. There are wide range of interventions available that could lead to important improvements in professional practice and patient outcomes – if used appropriately (Oxman *et al.*, 1995).

GP's have been found to dislike lectures (Long and Atkins, 1974) and prefer topics that are based upon their daily work (Westerman *et al.*, 1990; Newton *et al.*, 1994) a form of problem-based learning. GP's also dislike passive approaches such as postal distribution of guidelines or educational sessions are generally ineffective but interactive educational workshops, reminder systems and multifaceted interventions are more promising (Foy, Eccles and Grimshaw, 2001; Grimshaw *et al.*, 2001). Cranney *et al.* (2001) also confirmed findings of others that educational interventions are more effective if they are practice based.

5.2.3. Waiting room: Decor

The waiting room environment was the most discussed topic by parents and have also been the focus of many previous studies, e.g. functional efficiency (Ulrich, 2001) of healthcare environments from a pathological perspective, and neglecting the psychological needs of patients. Psychologically supportive surroundings were identified by Ruga (1989) as

something that should be a critical goal for designers as unsupportive design can raise obstacles to coping with stress. Elements which have restorative effects and support the psychological well-being of patients are natural settings (Hartig *et al.*, 1996), ambient features (lighting and odours), architectural features (spatial layout and room size) and interior design features (colour, artwork and plants) (Harris *et al.*, 2002; Sherman, Shepley and Varni, 2005).

With regard the exposure to natural settings, most healthcare facilities, including primary care, have been built in urban environments and thus lack the natural resources that patients can be exposed to (Dijkstra, Pieterse and Pruyn, 2008). It has been reliably found that stress-reducing or restorative effects of looking at nature are manifested as a collection of positive changes characterised by heightened positive feelings, reduced negative emotions, and changes in physiological systems indicating lower stress mobilisation (Parsons and Hartig, 2000; Marberry, 2006).

The evidence is still limited and many design stakeholders face difficulties in integrating all these elements into current design due to limited opportunities for this kind of research with clients. It appears healthcare designers are aware of the benefits of good interior and architectural design for patients but it is applied generically. This generic approach may be the most appropriate and cost effective, but can neglect the needs of the most vulnerable users. The opinion of the design stakeholders was that there was only so much that can be done without turning the waiting room into a completely child- or young person-orientated environment, which then excludes the needs of adults. The balance between addressing the needs of different users seems to be difficult and, although some modern environments have been able to achieve it, there are still many practices that have not.

Bishop (2008) identified key attributes within the physical environment as being important to children and young people. Amongst these attributes were three environmental aesthetic components; artwork, colour and brightness. These three components were found to contribute to children's estimation of the appropriateness of the environment for them and the child-friendliness of the environment (Bishop, 2008).

Figures 5.4 and 5.5 show good examples of child- and young person-friendly interior waiting room design. Figure 5.4 demonstrates a waiting room encompassing the use of nature, natural light and colourful artwork. Figure 5.5 shows artwork painted by children from a local school for the blind. As previously mentioned children appreciate having a 'feeling of ownership and welcome' in an environment (Bishop, 2008). Although Bishop's research was carried out at children's hospitals this could be an area to be implemented into primary care.

Again, there would need to be a balance between child- and young person-friendly decor and an environment suitable for adults and elderly patients.



Figure 5.4. An example of waiting room interior design showing child-friendly features



Figure 5.5. Colourful artwork by local children

The following images (Figures 5.6 and 5.7) demonstrate poor examples of child- and young person-friendly interior waiting room design. The figures show stark and dull environments with little concession to child- and young person-friendly decor. Figure 5.8 shows a poster board containing some non-child-friendly posters. The bottom left poster showing a man with

a hook through his cheek was mentioned specifically by one parent during the survey and referred to as a 'horrible' image for children to see.



Figure 5.6. An example of a stark waiting room environment



Figure 5.7. An example of a dull waiting room environment



Figure 5.8. Non-child-friendly posters

The main findings from this thesis about the decor of the waiting room environment were:

- Unsupportive environment design
- Boredom was experienced by all ages
- With an increase in age there was an increase in boredom and tension
- 0-4 year olds only ages to experience amusement and interest
- Decor is decided by a combination of architects, interior designers and the practice

The following design recommendation has been made:

Design recommendation (2): Increase child- and young person-friendliness of the waiting room environment in primary care practices.

Providing a friendlier environment for younger patients could help towards easing anxiety and tension, increase interest in the environment and reduce boredom. Example waiting room (Figure 5.9) features are:

1. Access to nature: plants and/or fish tanks (if affordable and sufficient space)
2. Soft coloured (wipe-clean) padded furniture
3. Smaller sized padded furniture for younger children/small (wipe-clean) bean bags/bean bag chairs
4. Child only area with padded walls and flooring

5. Cleanable toys for young children
6. Games and puzzles for older children and young persons
7. Up-to-date reading material for older children and young persons
8. TV screen (if affordable) on mute with subtitles, patients in control of channels
9. A room layout where younger patients can be separate from adult patients if needs be

Other features:

- Maximal natural light (windows, skylights, placement of mirrors) and access to fresh air
- Soft lighting and light, pastel coloured walls to create a calm environment
- Bright, colourful, nature orientated pictures and pictures drawn/painted by children or young persons
- Child-friendly healthcare posters situated low down on poster boards/walls, more adult-orientated posters situated higher up on poster boards/walls
- Radio playing quietly in background

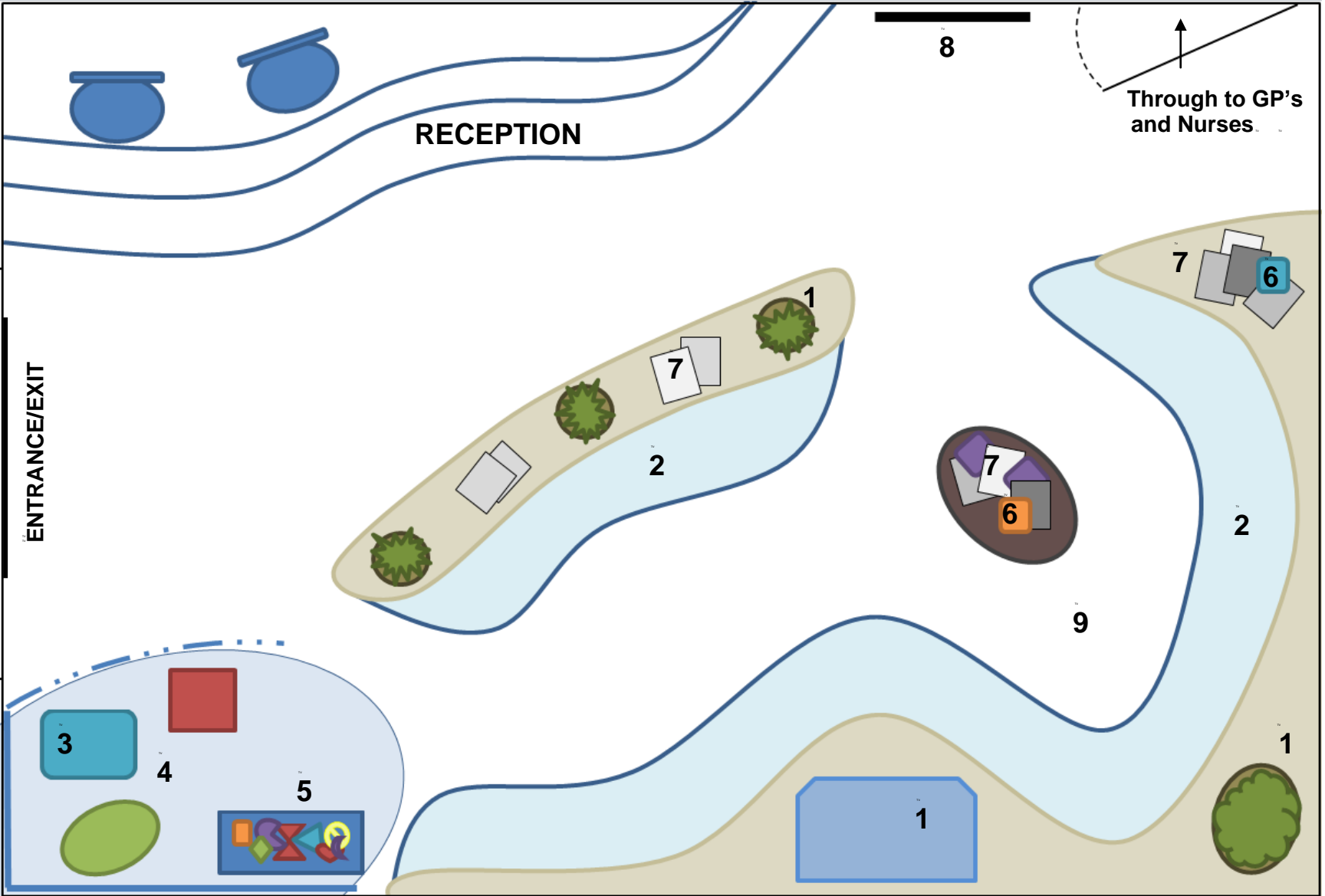


Figure 5.9. Example waiting room layout and features

5.2.4. Waiting room: Distraction

Provision for entertainment and distraction have been found to be designed for the very young (0-4 year olds). From the parent survey there appeared to be toys, books and play areas for young children, but less for older children and teenagers, with 15-18 year olds experiencing the most boredom. Younger children were also found to be the most relaxed which could be largely attributed to either their lack of understanding of healthcare situations and/or the better provision of distraction and entertainment made available for them while waiting.

MacRae and Michel (1998) investigated what patients considered to matter in the physical healthcare environment. By studying ambulatory, acute and long-term care patients, they found that 'conductive well-being' was an important aspect. This incorporated: comfort and positive distractions (e.g., magazines, changing displays of art, music, and photographs of patients and/or staff), an ambient atmosphere (related to temperature, lighting, colour schemes and furniture) and non-distressing visual or auditory elements in the environment (e.g., blood, needles, or other medical waste; noise; crowds).

The provision of entertainment material for patients is the responsibility of each individual practice and varies depending on the practice budget. This leads to wide variation across primary care waiting rooms. A more unified approach across NHS trusts could help provide a more standardised approach to providing for all user age groups. Regardless of budget, provisions for all age groups should be provided and not just focus on the very young or adult.

The main findings were:

- Distractions used frequently in healthcare settings include art with emotionally appropriate images and nature (Marberry, 2006)
- Materials are aimed predominantly towards very young children and are limited for older children and teenagers
- Boredom was experienced by all ages, with an increase in age there was an increase in boredom
- With an increase in age there was an increase in tension
- 0-4 year olds are the only ages to experience amusement and interest
- Materials available in waiting room are dependent on practice budget

Parents seem to appreciate having plenty available in waiting room environments for children of all ages to keep them amused. It became apparent that 15-18 year olds felt more

boredom than 0-4 year olds children, who also experienced more amusement and interest. This suggests that younger children are better catered for in this environment due to the lower numbers experiencing boredom. However, this an area that requires further research to help validate these findings.

Future research recommendation (2): To investigate and improve distraction and entertainment provision for all ages to help relieve boredom, stress and tension and increase amusement and interest in the waiting room environment.

Parents felt that young people especially were not catered for in waiting rooms and the material provided for them as magazines, was sometimes out of date. Providing distraction for older children and teenagers does not have to be video games and handheld games consoles which can be expensive, as there are other options such as the examples in Figures 5.10 – 5.13 which are all available at less than £10. The provision of internet resources (Wi-Fi) is another possible distraction for older children and teenagers as many have their own mobile phones, mp3 players (e.g. iPod) or games devices (e.g. Nintendo DS) with Wi-Fi functionality.



Figure 5.10. Tetris Cube



Figure 5.11. Maze Racer



Figure 5.12. Mensa: Electronic Solitaire



Figure 5.13. IQ Buster Big Nail Puzzles

5.2.5. Treatment room: Decor

Similar to the waiting room, the decor of the treatment room environment had concessions in the form of pictures for younger children but not for older children or teenagers. All age groups were found to experience boredom in this environment, especially 10-14 year olds. The general decor again varies with individual practices and clinicians. The nature of this room is very different to the waiting room and there are Care Quality Commission Regulations (Essential standards of safety and Quality, 2010) that are to be adhered to. The choice of furniture and pictures will ultimately be that of the practice and clinician. The use of adjustable furniture and bright, colourful pictures and ornaments, and the use of nature should be considered carefully to accommodate the needs of all users and their psychological well-being.

Reiterating the argument by Shepley (2001), if we believe children are more sensitive to the environment, then more attention should be placed on children. In addition, if we believe that children respond to the environment differently than adults, then we will not be able to generalise the results of adult studies to paediatric populations. Based on this argument, children may be more vulnerable to the effect of Lawton and Nahemow's (1973) environmental press theory (Figure 5.14). This suggests that when individuals become more stressed (as they do when they are ill) they are less capable of coping with negative aspects of the physical environment.

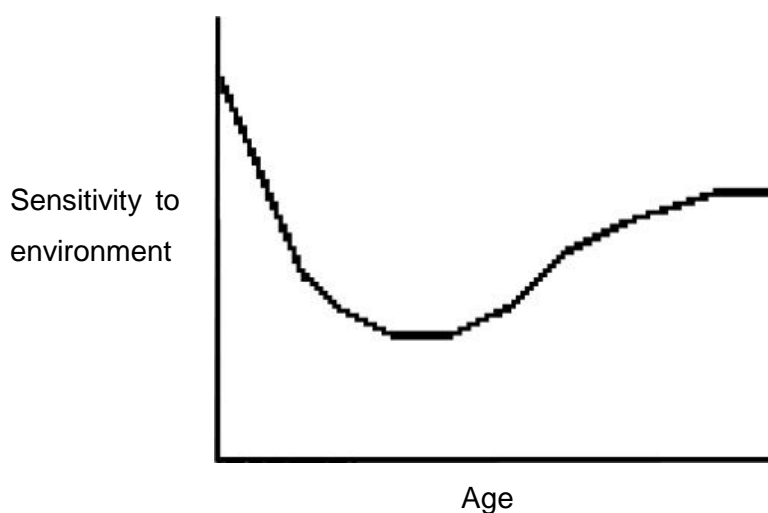


Figure 5.14. Application of the Environmental Press Theory

The main findings were:

- Females are less relaxed than males
- Younger children the least courageous
- All ages experienced boredom
- Treatment room décor is decided between the practice and the individual healthcare professional/s

Although recognized as a clinical environment which needs to be professional, treatment rooms were still considered to be an environment that could be more relaxing and engaging for younger patients. More research needs to be undertaken looking specifically at primary care treatment room environments for children and young person's in addition to acute, secondary care environments such as paediatric units.

Future research recommendation (3): How can design stakeholders increase child- and young person-friendliness of primary care treatment room environments whilst still providing a clinical environment and adhering to Care Quality Commission Regulations.

Whilst keeping with the functional purpose of the room and remaining primarily a clinical environment, the lighting, colour of pictures and texture, colour and layout of furniture could help create a more pleasurable environment for.

Example treatment room features:

- Natural light where possible
- Bright, colourful, nature orientated pictures and pictures drawn/painted by children
- Humorous or interesting pictures that could be used as part of distraction techniques
- Soft, light coloured walls and flooring
- Soft and bright coloured, comfy furnishings
- Adjustable chairs or child-sized chairs available
- Irrelevant medical equipment hidden/out of sight where possible.

5.2.6. Treatment room: Explanation

Anxiety was a negative emotional response to treatment rooms that was found to increase with age. Children from the age of 12 are able to speculate about future events and outcomes (Lueder and Rice, 2008) and the content of worry also changes as they get older (Vasey, Crnic and Carter, 1994). This could help explain the increase in anxiety in older children and young person's as they are able to consider the threatening outcomes and negative consequences that can be associated with health. A possible technique to help

alleviate this anxiety could be a proper explanation of healthcare to the child or young person. Parents expressed their gratitude at clinicians who addressed their child directly and explained issues at an age-appropriate level. Healthcare professionals also expressed how helping explain situations, even by drawing diagrams, helped at least partly to ease worry and anxiety. When uncertainty about what could be expected is reduced, the experience can be made less distressing (Kent and Dalglish, 1986). One healthcare professional explained the use of leaflets they hand out to parents after consultation for them to refer back to understand the situation more thoroughly. It is unknown, however, whether this was personal preference for this clinician, standard procedure for the practice or across the whole Trust.

The main findings were:

- An explanation at an age-appropriate level was appreciated by parents
- With an increase in age there was an increase in anxiety and tension
- Each individual healthcare professional is responsible for their manner and behaviour towards patients

Due to the variations in cognitive development some healthcare terms and explanations will not be understood. Helping a child or young person to thoroughly understand what is happening together with remaining positive and comforting may help ease their anxiety and tension. The following recommendation has been made.

Design recommendation (3): Training for clinicians and administrative staff in effective ways to communicate healthcare to different aged children and young persons, and difference in worry and coping strategies of children and young persons.

5.2.7. Medical Equipment: Aesthetics vs. function

The aesthetic appearance of medical equipment was found not to be as important to parents as expected. There was more appreciation for the function of medical equipment than the way it looked. The use of colour and smaller sized instruments was mentioned by parents and healthcare professionals but the function of the equipment was seen to be of much higher importance than aesthetics.

Due to time constraints of this thesis and the lengthy process of obtaining the appropriate documentation to access children for research, children were not asked directly about the appearance of medical equipment. Based on the findings of Desmet (2003) and Reynolds and Lu Liu (2010), however, it is known that the appearance of medical equipment can impact on a child's emotional response. Both these studies involved children in the research

suggesting that children are more sensitive to the physical appearance of instruments than parents whose main concern is the overall health benefit. Young children especially may not have the cognitive development to understand the purpose of an instrument and therefore their judgement turns towards how it looks and this dictates their reaction, so a particularly negative emotional reaction could taint their overall experience.

The emotional reaction is not elicited by the product as such, but by the appraised significance of this product for our concerns (Desmet, 2002; Norman, 2003) or in other words 'the felt tendency toward anything intuitively appraised as good (beneficial) or away from anything intuitively appraised as bad (harmful)' (Arnold, 1960). On an aesthetic level, it is considered to be the design of a product's, e.g. appearance, to stimulate one or more of the sensory modalities. For example, a product can be beautiful/unsightly to look at, make a pleasant/unpleasant sound, or feel nice/not feel nice to touch.

Kettwich *et al.* (2006) investigated the appearance of syringes and needles to tackle needle phobia in both children and adults. Fear of needles can lead to avoidance of appropriate medical care in childhood and adulthood (Öst, 1992). Adults may express needle phobia verbally or even avoid coming into the physician's office, while children may be more overtly fearful, anxious or hysterical (Kettwich *et al.*, 2006) and compromise important procedures. It was found that 'needle phobia and stress in paediatric and adult chemotherapy patients are significantly reduced by the use of stress-reducing medical devices' (Kettwich *et al.*, 2007).

The 'stress-reducing devices' are where the immediate appearance has been changed with the aim of reducing the 'scary' nature of the medical equipment, e.g. the decoration of a device. Kettwich *et al.*, (2006) exposed 25 paediatric and 25 adult chemotherapy patients to conventional or stress reducing decorated butterfly needles and syringes (Figures 5.15 and 5.16). It was found that 100% of children and adults felt that stress-reducing medical devices should be available in chemotherapy clinics, and that needle phobia and stress in paediatric and adult chemotherapy patients were significantly reduced by the use of stress-reducing medical devices.

Kettwich *et al.* states it is likely that decoration of a medical device is actually a neurophysiologic intervention, resulting in stimulation of brain areas not usually associated with the fear, anxiety, and aversion responses caused by viewing medical devices. In this sense, the intervention of decorating a medical device has a close parallel to other cognitive, distraction, and mind-body imagery methods. However, unlike these other interventions, decoration of the medical device actually focuses the patient's attention and interest on the medical device, yet fear, aversion, and anxiety of needles and syringes are still significantly



Figure 5.15. Decorated syringes



Figure 5.16. Butterfly needles

reduced. This suggests that the decorations interfere with the established link between visual recognition of a perceived threat and the subsequent emotional response to that perceived threat (Kettwich *et al.*, 2006).

Further research would be needed with children and young people as primary users to investigate how much aesthetics (in terms of size, colour, form, texture, etc.) can impact on a child's cognitive and emotional reaction to healthcare procedures. However, although children have been included to some extent in healthcare research, young persons are under-represented (Carter, 2009) and in particular in the design of medical products (Lang *et al.*, 2012a). As a result, they often have to accept medical devices where adults have acted as proxies on their behalf (Lang *et al.*, 2012b). This is far from ideal since 'by the time we are old enough to reflect on what it is like to be a young child, we are so far removed from the experience that it is difficult to empathise' (Aitken, 1994). Within this population, there is wide variability between persons and for individuals physiological and cognitive changes occur rapidly (Kroemer, 2006). However, from a physical perspective, adolescents are too often treated as short adults and psychologically as tall children (Matthews, 2001). Medical device manufacturers need to work with users and clinical staff to account for the variables and design in ways to combat the issues.

Lang *et al.* (2012a) identified another important consideration of device design regarding the way in which a device may either help or hinder care transition to the adolescent user, consequently facilitating the promotion of good health behaviours into adulthood. Lang *et al.*

also provide evidence to suggest that ‘adolescents are both capable and willing to be involved in research, especially when they perceive that their contribution is relevant to them or applicable to real world issues.’ Although guidelines on conducting research with adolescents exist, they are often contradictory and there is no general consensus on how research with adolescents should be conducted.

Findings:

- Older children and young people feel the most anxious but are also the most courageous
- Neutral feelings towards the aesthetic appearance of instruments
- Medical product companies are the main stakeholders in medical product design
- Young persons are inadequately represented within medical product design

Other key findings were a neutral response to staff making an effort with children when they arrived at a primary care practice to make them feel relaxed, and a tense feeling towards medical equipment. However, medical equipment was found to be of least importance according to parents and their child’s emotional experience at a primary care practice. This contradicted the limited research available, so further research would be needed.

Future research recommendation (4): Further investigation of the aesthetic appearance of medical equipment for children and young persons.

Adjusting the size of instruments and equipment specific for smaller (younger) patients could help reduce some of the ‘scary’ nature of medical equipment. Adding colours and incorporating different textures and forms could also help to reduce anxiety amongst older children and teenagers. The anxiety and tension could be attributable to the increased cognitive and emotional development and experience with healthcare procedures of these age groups compared to their younger counterparts, but the aesthetic appearance of medical products is a relatively newly investigated subject area showing promising results (Desmet, 2003; Kettwich *et al.*, 2006; Reynolds and Lu Liu, 2010) and could prove to make a difference for younger patients in primary care. Further research needs to take place, however, to investigate these issues in more detail.

5.2.8. Medical equipment: Distraction

Many positive comments were made by parents and healthcare professionals about the use of distraction with children and young person’s during procedures such as vaccinations or blood extraction. Parents appreciated the clinician making efforts to distract their child and make the procedures as stress free as possible. Likewise the clinician appreciated parents

helping to distract and help their child through procedures especially if the child appeared anxious. Both distraction and nonprocedural talk have been related to decreased levels of distress (Blount *et al.*, 1989; Gonzalez, Routh and Armstrong, 1993; Dahlquist, Power and Carlson, 1995; Frank *et al.*, 1995; Sweet and McGrath, 1998; Cohen, Manimala and Blount, 2000).

The distraction techniques used will vary between clinicians but there should be an effort made by clinicians to discover what works well and works well for different ages. Distraction techniques fits in with learning good coping strategies for different aged children and young person's along with age-appropriate explanations of what is happening. Parents were very appreciative of having the procedure explained to them and the child and receiving feedback on what was happening and what will happen next. The use of rewards for young children was another positive aspect mentioned by parents and healthcare professionals.

Overall the use of distraction techniques, coping strategies, explanation and rewards as a means of positive reinforcement could have a positive impact on children and young person's and help towards a more a pleasurable primary care experience.

The main findings were:

- Increased anxiety and tension with age towards medical equipment
- Distraction techniques vary from clinician to clinician

Both parents and healthcare professionals spoke positively about using distraction during a procedure using some form of medical equipment. However, not all healthcare professionals seemed to do this but more research would need to be done to investigate this further.

Future research recommendation (5): To investigate whether the use of distraction techniques for children and young persons during medical procedures would be beneficial to overall healthcare experiences.

Knowing how to effectively distract a young child, older child or even a young person could be the difference between making a procedure successful or not. The clinicians will effectively be making their own job easier by doing so and at the same time helping the patient through a (potentially painful) procedure. The more distracted they are the less likely like they are to be anxious or tense. This could be important when dealing with very young patients as their early experiences could dictate their view of medical procedures later in childhood and even in to adult life.

5.3. Commercial feasibility

This thesis has concentrated on identifying design recommendations for primary care practices to improve children's and young person's experiences. Therefore it is important to consider the findings in terms of commercial feasibility.

5.3.1. Potential benefits

The recognition of children's and young person's design needs in a healthcare environment could help improve these user's overall experiences. Primary care is experienced by all children from a young age, when they are very impressionable. Improving healthcare experiences for children and young persons can help set the precedence for their view on healthcare throughout life. As mentioned in section 5.2.6 using the example of needles, fear of needles can lead to avoidance of appropriate medical care in childhood and adulthood (Öst, 1992).

Improving experiences could also help increase the client base of practices due to patient rating websites such as NHS Choices (www.nhs.uk). The NHS Choices website allows patients to view ratings of local practices from the National Patient Survey (Figure 5.17) before registering. Addressing all aspects of a practice from the environment to staff friendliness can give a better overall experience for patients, increasing the likelihood of the practice receiving higher scores.

This research also supports the need to use real users in design research. Environments and products so readily available and used by a vast majority of the general population should have a large amount of user input. This user input should also be representative of the different user groups (children, elderly, disabled, etc.) and not just those that are most accessible through patient participation groups.

5.3.2. Potential disadvantages

There are two main disadvantages to these design recommendations. The first being the cost of implementation: to update the physical environment of current practices, the aesthetic appearance of equipment and staff training. Not all recommendations would be applicable to all practices and so the cost would vary depending on what and how much could be done.

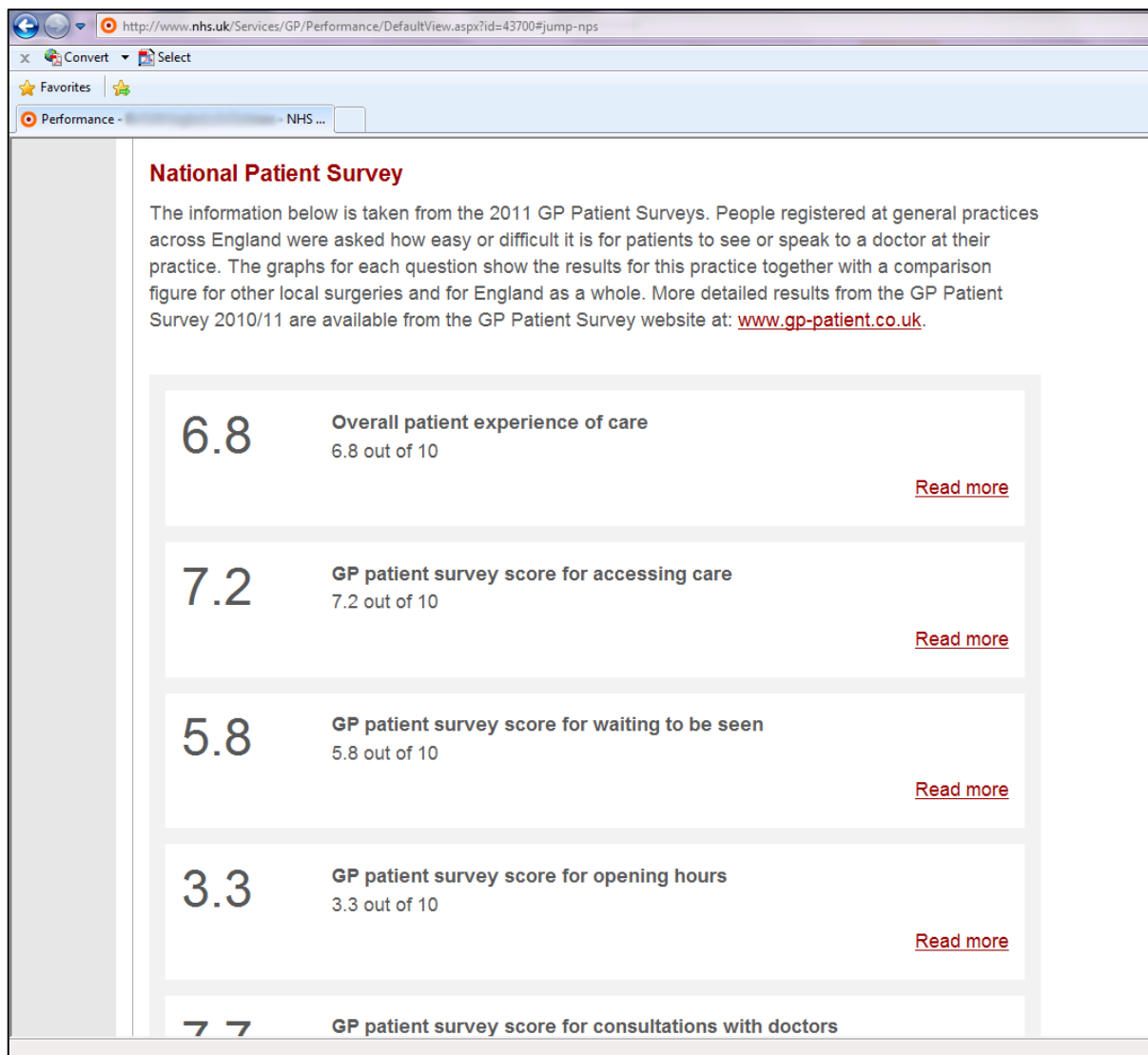


Figure 5.17. Example National Patient Survey results for a GP practice

The other disadvantage would be the risk of making the environment *too* orientated around children and young persons and alienating older patients. These recommendations should help to ensure that children and young persons have been considered in the design process and that their needs for supportive design to transform primary care practices into not just a child-orientated environment, but a child-friendly environment. Each practice would need to assess their environments individually and adjust it accordingly.

5.4. Relevance to industry

The research in this thesis has great relevance for industry for healthcare environment design and healthcare product design by considering the psychological well-being of patients within primary care. Predominantly research on healthcare environments and products has

been conducted in hospitals. The techniques used for secondary care environments and equipment can be transferred into primary care and look at the whole healthcare experience.

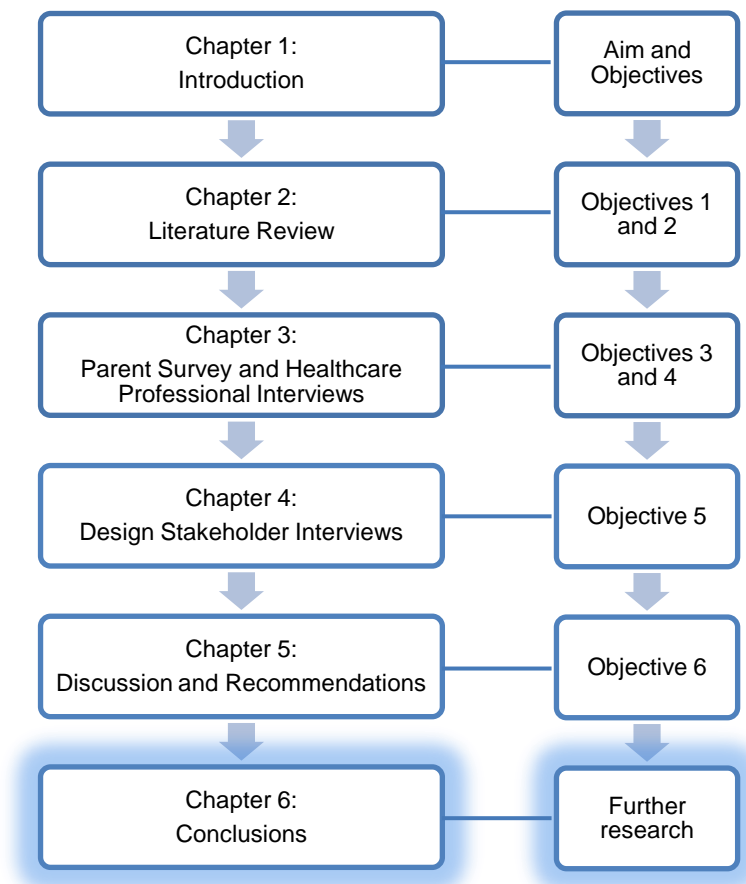
The research is also relevant to design for children and young persons as their interpretation of an environment or product are different. Children and young people are very different cognitively, emotionally, socially as well as physically compared to adults, but research tends to focus mainly around younger children. Older children and young people (teenagers) also differ in comparison to adults and these user groups tend to be either slotted in to the 'child' or 'adult' category. As stated in Chapter 2, 'children are not little adults'. They need to be addressed as separate user groups and not have adult data applied to an environment or product that is supposed to serve their needs as well.

5.5. Contribution to knowledge

Based on the knowledge gained in this thesis, Figure 5.2 (section 5.2) shows how design influences a child or young person's primary care experiences. It also shows the different design elements involved in the overall healthcare experience.

The main contribution to knowledge in this thesis is the focus on primary care practices. The majority of research on healthcare environments has focussed on hospital environments and equipment. General practitioners at primary care practices 'are the first point of contact for nearly all NHS patients' (NHS Choices, 2011). The vast majority of people will have had an experience with a primary care practice and this could shape their overall view of healthcare.

Chapter 6: Conclusions



6.1. Aims and objectives

The aim of this thesis was to ‘*use design to improve healthcare interactions of children and young persons in primary care practices.*’ To achieve this, a set of objectives were established:

- *Objective 1: To review literature about children and healthcare, design and emotion and healthcare design*
- *Objective 2: To identify the most appropriate methodology in order to achieve objectives 3 and 4*
- *Objective 3: Explore parent and healthcare professional experiences of healthcare products and environments for children and young people under 18 years*

- *Objective 4: Identify areas for feasible design adjustment/improvement in the waiting room environment, treatment room environment, medical equipment and staff behaviour*
- *Objective 5: Establish current design practices using design stakeholders*
- *Objective 6: Provide design recommendations*

A literature review was conducted to understand the previous research on healthcare design, particularly in relation to children and young persons (objective 1, Chapter 2). In addition, a review of literature on research methodology was conducted (objective 2, Chapter 2). Surveys of parents and interviews with healthcare professionals were then conducted to explore the experiences of children and young persons with primary care practices (objectives 3 and 4, Chapter 3). Following this, interviews with design stakeholders were conducted to establish current design practices (objective 5, Chapter 4). The findings from each of these methods were discussed and design recommendations made where appropriate (objective 6, Chapter 5).

6.2. Design recommendations

Three findings from this thesis were found to be in agreement with the available literature and therefore three design recommendations have been made. These recommendations encompass varying aspects of design ergonomics (holistic design); (1) service design, (2) environmental/interior design and (3) training design.

1. *To provide advice and information for parents on helpful behaviour and effective coping strategies for their child/ren when using primary care services.*

Literature showed that children's cognitive and emotional developmental levels vary greatly from birth up to the age of 18. They interpret situations differently depending on age and can be easily influenced by the behaviour of surrounding people. Parents were found to influence children's behaviour both in literature and the research conducted in this thesis.

2. *Increase child- and young person-friendliness of the waiting room environment in primary care practices.*

Supportive environmental design was frequently mentioned in the literature, especially supportive healthcare environments. Children and young person's understanding and interpretation of an environment will differ to adults. Therefore, the design of an environment is an important aspect to help support the cognitive well-being of younger patients in primary care, as well as in secondary care.

3. *Training for clinicians and administrative staff in effective ways to communicate healthcare to different aged children and young persons, and difference in worry and coping strategies of children and young persons.*

Coping strategies of children vary as they grow up and this could be an important aspect of their healthcare experiences. It would be useful for clinicians to be aware what worries a child the most during healthcare depends on their age and therefore what coping strategy would be best to help them. Parents positively reported the helpfulness of clinicians who used effective techniques to help their child cope during procedures.

6.2. Recommendations for future research

Where the findings were not consistent with the literature or there was little or no literature available to make comparisons, recommendations for future research were made. There were five areas highlighted:

1. *To explore and understand healthcare professional's behaviour towards children and young person's and the relationship to their healthcare experiences. To investigate training methods that incorporate 'best practice' for interactions with young patients in primary care.*
2. *To investigate and improve distraction and entertainment provision for all ages to help relieve boredom, stress and tension and increase amusement and interest in the waiting room environment.*
3. *How can design stakeholders increase child- and young person-friendliness of primary care treatment room environments whilst still providing a clinical environment and adhering to Care Quality Commission Regulations.*
4. *Further investigation of the aesthetic appearance of medical equipment for children and young persons.*
5. *To investigate whether the use of distraction techniques for children and young persons during medical procedures would be beneficial to overall healthcare experiences.*

These recommendations encompass the healthcare professional's role in children's and young person's experiences (1, 5) and the design stakeholders relationship with using children and young person's as users in research (2, 3, 4).

Very little research seems to have been conducted using healthcare professionals as users. Their involvement in healthcare is as important, if not more important than the physical environment. They are a large part of the overall healthcare service and their role is likely to have a major impact on a patient's experience.

Research involving children and young people also requires attention. Although not possible for this thesis, this research could act as a starting point for further research including children and young persons. Future research could involve shadowing children of different ages as they visit primary care practices. Ideally, a longitudinal study involving case studies with children from a young age up to the age of 18 could be conducted, recording their primary care experiences. It would be interesting to note if earlier experiences had impacted their views of primary care and affected later experiences.

Children's and young person's input into medical equipment design, in particular the aesthetics, is another area that requires further research. Exact elements of equipment (colour, form, texture, size, etc.) were not examined in this thesis which took a more general approach in terms of assessing the importance of aesthetics. Although medical equipment aesthetic design was not considered to be an important aspect of primary care according to parents from this research, research investigating whether children and young person's had a similar or different view could be done. More detailed information could be gathered on specific aesthetic elements of medical equipment that cause the most impact.

6.2.1. Other user population experiences

Finally, as a complementary study, experiences of other populations could be investigated. For example, older generations (65+ and 80+ years) can have reduced cognitive ability, reduced physical ability and increased physical discomfort. Older user groups are also frequent users of primary care services, so the environment and the equipment could impact their overall healthcare experiences also. Other user populations to investigate could be those with physical or cognitive disabilities, or from different cultural backgrounds.

The key to an environment for a range of user populations should be variation and inclusivity. Although children and young people are a vulnerable user group due to their cognitive development, their needs should not impact detrimentally on the needs of other users.

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Appendices

Appendix 2.1: Summary table of literature

Appendix 2.2: CASP Form

Appendix 3.1: Parent Survey

Appendix 3.2: Interview Schedule

Appendix 3.3: Interviewee Information Sheet

Appendix 3.4: Interview Consent Form

Appendix 4.1: Design Stakeholder Interview Schedule

Appendix 4.2: Interviewee Information Sheet

Appendix 4.3. Interviewee quotations

Author(s)	Title	Methodology	Finding(s)	Critique
Arneill and Devlin (2002)	Perceived quality of care: The influence of the waiting room environment	Students (n = 147) and senior citizens (n = 58) were shown slides representing 28 distinct waiting room environments from different primary care practices. Their perceptions on quality of care and how comfortable they would feel in each environment were measured.	The findings supported the initial hypothesis that perceived quality of care and comfort would be greater for waiting rooms that were nicely furnished, light, have artwork and warm.	Previous research supported validity of method used
Bishop (2008)	From their perspectives: children and young people's experience of a paediatric hospital environment and its relationship to their feeling of well-being (doctoral thesis)	Exploratory qualitative case study carried out at a Children's Hospital in Sydney. Main study: 25 children and young people (9-18 years) completed semi-structured interviews about their response to the environment of the hospital and their experience of hospitalisation	Children and young people's experience of a paediatric setting involves a number of major areas of influence: their personal situation, their social experience, their interaction with the physical environment, opportunities and characteristics of the organisation, and the effect of time. Findings also revealed that children's feeling of well-being is linked to their ability to feel comfortable in the environment, to maintain a positive state of mind, and to remain positively engaged with the experience and the environment.	Conducting interviews with children can be difficult particularly in hospital settings due to constant interruptions. Interviews were sometimes conducted in small rooms used to receive diagnosis information, potentially making it a difficult environment for the child. However, the findings provide the basis for further research.
Chitturi, Raghunathan and Mahajan (2007)	Form versus function: how the intensities of specific emotions evoked in functional versus hedonic trade-offs mediate product preferences	3 experiments: (1) Students (n = 100) cell phone questionnaire, Students (n = 90) consumer decision making questionnaire, Students (n = 132) asked to imagine buying cell phone or laptop that met/exceeded cut-offs on functional and hedonic dimensions	Functionally superior option chosen in loss-loss contexts to minimise negative emotions, and hedonically superior option chosen in gain-gain contexts to maximise positive emotions.	Results restrictive to one type of user group and age: students. Further research using different user groups would be required to validate findings.
Chitturi (2009)	Emotions by design: A consumer perspective	Between subjects design: 240 undergraduate students	Positive, negative and prevention emotions come from the	Results restrictive to one type of user group and age:

Author(s)	Title	Methodology	Finding(s)	Critique
		Questionnaire on cell phones with differing amounts of utilitarian and hedonic benefits	consumption of hedonic and utilitarian design benefits offered by a product	students. Further research using different user groups would be required to validate findings
Desmet (2002)	Designing emotion (unpublished doctoral thesis)	Varying studies conducted to develop tools and knowledge to support designers in manipulating emotional impact of their designs	PrEmo (product emotion measurement instrument) and [product and emotion] navigator	Convenience sampling used and needs further research
Desmet and Dijkhuis (2003)	A wheelchair can be fun: a case of emotion-driven design	Using a tool called 'PrEmo' the emotional responses towards conventional wheelchairs of both children and parents (n = 8) were assessed and from this assessment a new design was created	Emotional responses to the new design were assessed and showed, with respect to the emotional impact, that the new model differentiated in a positive way from existing models	Small sample of participants used
Desmet and Hekkert (2007)	Framework of product experience	Review of other theorists and a the production of a framework (3 distinct components to product experience: aesthetic experience, experience of meaning, and emotional experience)	Affective experiences can be used to facilitate designers attempts to design for experience	Framework is basic and needs further development
Dijkstra, Pieterse & Pruyn (2006)	Physical environmental stimuli that turn healthcare facilities into healing environments through psychologically mediated effects: systematic review	Cochrane review methodology used: systematic review with specific key words and criteria for methods. 30 trials met criteria	Three relevant dimensions of environmental stimuli: ambient, architectural and interior design features. Formulating guidelines for evidence-based design of healthcare facilities seems premature.	In need of more controlled clinical trial. But enough to indicate the concept remains a promising field for future research
Dijkstra, Pieterse & Pruyn (2008)	Stress-reducing effects of indoor plants in the built healthcare environment: The mediating role of perceived attractiveness	Using photographs of hospital rooms with either indoor plants or a painting of an urban environment in them. Participants (n = 77) rated their perceived stress and perceived attractiveness of the rooms	Findings confirmed the stress-reducing properties of natural elements in a built healthcare environment	Simulation experiment – can this be replicated for real healthcare settings?

Author(s)	Title	Methodology	Finding(s)	Critique
Folkman and Lazarus (1988)	The relationship between coping and emotion: implications for theory and research	Along with a review of literature, married couples were interviewed (n = 75) over a 5 month period about recent stressful encounters, emotions experienced during these encounters and how they coped	Strong evidence was found that coping is a significant mediator of emotional responses in stressful encounters	Only one user group used - further user groups require studying to verify findings
Kivetz and Simonson (2002)	Earning the right to indulge: effort as a determinant of customer preferences toward frequency program rewards	Series of studies with approx. 3100 consumers: travellers waiting for flight at domestic terminal of a major airport aged 18-80. Frequency flyer program used as example, asked ppt's to indicate preference towards likelihood of joining described programme. Rewards used were either hedonic luxuries or utilitarian necessities.	Higher frequency programme requirements shift consumer preference in favour of luxury rewards – consumers may believe they are more entitled to luxury goods when they earn them by exerting more effort (earning the right to indulge through hard work) even if the effort is not labour, but rather purchase requirements.	Helps provide guidelines for promotion of frequency programmes but further research is needed to further improve the understanding of consumer's evaluation of frequency programmes.
Lazarus and Folkman (1984)	Stress, appraisal, and coping (book)	Based on available literature, authors present their theory of stress focusing on cognitive appraisal and coping.	-	Would need evaluating to see if still valid as more than 20 years old – require updating
McCormick and Shepley (2003)	How can consumers benefit from therapeutic environments?	A review of the involvement of consumers/end-users in research and development of therapeutic environments in healthcare.	There are designers, clients and users, but main communication is between designers and clients. Identified many areas for future research.	Brief overview was conducted, more detailed review needed.
Ong, Bergman, Bisconti and Wallace (2006)	Psychological resilience, positive emotions and successful adaptation to stress in later life	Two studies were conducted to investigate the functional role of psychological resilience and positive emotions in the stress process. The first study explored naturally occurring daily stressors and the second examined data from a sample of recently bereaved widows	Over time, experience of positive emotions functions to assist high-resilient individuals in their ability to recover effectively from daily stressors.	Lack of experimental control over confounding variables and reliance on self-reports. Social support affecting stress or emotion was not assessed.

Author(s)	Title	Methodology	Finding(s)	Critique
Öst (1991)	Acquisition of blood and injection phobia and anxiety response patterns in clinical patients	A retrospective study that examined the onset of blood and injection phobias and established that. Questionnaire used: origin of phobia, physiological reactions, anticipatory anxiety and negative thought (n = 137)	Majority (52%) of patients attributed onset of phobia to conditioning experiences	Need further longitudinal studies to look in to why some people develop a phobia after a traumatic experience and why some do not
Reynolds and Lu Liu (2010)	The Study of Children's Emotional Responses and Its Application to the Redesign of the Traditional Dental Handpiece	Surveys were administered to children (n = 329) to determine what aspects of a new drill they would like/dislike. Interviews also conducted.	The results were used to design a new model, and there was a reduced emotional stress response in young patients towards the new model.	High sample size. Needs repeating for validation.
Rocha, Prkachin, Beamont, Hardy and Zumbo (2003)	Pain reactivity and somatisation in kindergarten-age children	Measured facial expressions of children during inoculations	Found that child temperament, previous negative experiences with medical procedures, and maternal responses to their child's pain was positively associated with pain reactivity. Pain reactivity may contribute to the development of somatisation.	Fathers were not included in the sample, problems with measure of family health information.
Rocha and Prkachin (2007)	Temperament and pain reactivity predict health behaviour seven years later	7 year follow-up measures of health behaviour with children who participated in previous study of pain reactivity and somatisation	Early response styles may indicate a risk for increased health care utilisation and poorer health and well-being later in childhood	Smaller sample size compared to previous study. Larger study needed to help validate findings.
Russell and Mehrabian (1978)	Approach-avoidance and affiliation as functions of the emotion-eliciting quality of an environment	Hypothesized that approach toward an environment and the desire to affiliate there are influenced by the emotion-eliciting quality of that environment. In two studies, undergraduates (n = 200, 310) rated these two behaviors in response to settings shown via color photographic slides.	Approach toward the setting was determined by (a) a main effect of its pleasantness, (b) an interaction effect such that approach varied directly with arousing quality of the setting in pleasant settings, but inversely with arousing quality in unpleasant settings and (c) a weak inverted-U relationship with arousing quality in neutrally pleasant-unpleasant settings such	Exploring verbal reports as functions of settings shown via colour slides – the external validity of the results could be questioned – can these results be generalised to actual behaviours in actual settings. Generalizability of the findings on the pleasure-arousal hypothesis requires replications with differing

Author(s)	Title	Methodology	Finding(s)	Critique
			that approach was greatest in moderately arousing settings	methodologies.
Salmela, Salaterä, Ruotsalainen and Aronen (2010)	Coping strategies for hospital-related fears in pre-school-aged children	Used 4-6 year old children (n=82) to describe and recall the ways they cope/coped when in hospital	517 different types of coping strategies were mentioned. Play and family presence were two of the most common coping strategy mentioned	Gathered data from children themselves. Participation relied on volunteering. Different interviewers were used throughout, although all trained.
Shepley (2001)	Research on Healthcare Environments for Children and their Families	Overview of research on healthcare environments for children and their families by discussing the nature and quality of research in the field and the type of research available.	It was identified that out of the 85 studies that Rubin et al. (1998) reviewed only three were directed at children proving that information in this area is insufficient. Also identified is the lack of theory and research regarding paediatric environments and that we cannot generalise the results of adult studies to paediatric populations	Further studies needed.
Ulrich (1991)	Effects of interior design on wellness	Review of case studies exploring the positive impact of art/decor related to nature. Culmination of findings for psychologically supportive design.	Healthcare facilities should be designed to support patients in coping with stress. Growing amount of evidence suggesting nature elements or views can be effective as stress-reducing, positive distractions that promote wellness in healthcare environments	Basic overview, no statistical data. Further studies needed to help validate findings.
Ulrich (2001)	Effects of healthcare environmental design on medical outcomes	Review of existing support for 'healing' environments	Definite shift towards providing for psychological needs of patients than just functional efficiency of treating pathological diseases	Restricted amount of evidence, but relatively recently researched field
Ulrich, Simons, Losito, Fiorito, Miles and Zelson (1991)	Stress recovery during exposure to natural and urban environments	Participants shown stressful movie, then exposed to colour/sound videotapes of 1 of 6 different natural and urban	Supported psycho-evolutionary theory that restorative influences on nature involve a shift towards more positively- toned emotional	Further evidence needed to support findings

Author(s)	Title	Methodology	Finding(s)	Critique
		settings – stress recovery obtained from self-ratings of affective states and physiological measures (e.g. HR)	state	
Ulrich, Zimring, Zhu, DuBose, Seo, Choi, Quan and Joseph (2008)	A review of the research literature on evidence-based healthcare design	Exhaustive search for empirical studies that link design of hospital physical environments with healthcare outcomes	Well-designed physical settings play an important role in making hospitals safer and more healing for patients and better places for staff to work	Further evidence needed to support findings
Vasey, Crnic & Carter (1994)	Worry in childhood: A developmental perspective	Examination of the content and process of worry in children 5-6, 8-9 and 11-12 years.	Suggested that the worry process may become increasing complex in middle childhood and supported the view that the content of children's worries is constrained by social-cognitive limitations reflected by their age and level of self-concept development	Provides starting point but further studies with better measures of verbal ability needed
Zautra, Smith, Affleck and Tennen (2001)	Examinations of chronic pain and affect relationships: applications of a dynamic model of affect	Review of studies involving the daily or weekly fluctuations in pain and negative affect among participants with fibromyalgia or arthritis. Roles of positive affect and mood clarity in modifying the size of the relationship between pain and negative affect were examined as a means of testing the predictions of a dynamic model of affect regulation.	It was found that the presence of positive affect reduced the size of the relationship between pain and negative affect.	Evidence for model is limited - needs further study

Appendix 2.2: CASP Form

Derived from Critical Appraisal Skills Programme (CASP), Public Health Resource Unit, England (2006).

Screening Questions:

<p>1. Was there a clear statement of the aims of the research? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>What the goal of the research was</i> • <i>Why it is important</i> • <i>Its relevance</i> 	<input type="checkbox"/> Yes	<input type="checkbox"/> Can't tell	<input type="checkbox"/> No
<p>2. Was the appropriate method used? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the method was an appropriate way of answering the question under the circumstances</i> • <i>If qualitative, whether the research seeks to interpret or illuminate the actions and/or subjective experiences of participants</i> 	<input type="checkbox"/> Yes	<input type="checkbox"/> Can't tell	<input type="checkbox"/> No
<p>3. Was the research design appropriate to address the aims of the research <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the researcher has justified the research design (e.g. how they decided which methods to use?)</i> 	<i>Write comments here</i>		
<p>4. Was the recruitment (sampling) strategy appropriate to the aims of the research? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the researcher has explained how the participants were selected</i> • <i>If they explained why the participants they selected were the most appropriate to provide access to the type of knowledge sought by the study</i> • <i>If there are any discussions around recruitment (e.g. why</i> 	<i>Write comments here</i>		

<p>some people chose not to take part)</p>	
<p>5. Were the data collected in a way that addressed the research issue? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the setting for the data collection was justified</i> • <i>If it is clear how data were collected (e.g. focus group, semi-structured interview etc.)</i> • <i>If the researcher has justified the methods chosen</i> • <i>If the research has made the method explicit (e.g. for an interview, do they explain how the interviews were conducted and if an interview guide/schedule was used</i> • <i>If methods were modified during the study does the researcher explain how and how</i> • <i>If the form of the data is clear (e.g. audio, video, notes etc.)</i> • <i>If the research has discussed the quantity, e.g. power calculation for experimental data or theoretical saturation for qualitative data</i> 	<p><i>Write comments here</i></p>
<p>6. Has the relationship between the researcher and participants been adequately considered? <i>Consider whether it is clear:</i></p> <ul style="list-style-type: none"> • <i>If the researcher critically examined their own role, potential bias and influence during</i> <ul style="list-style-type: none"> ○ <i>Formulation of research questions</i> ○ <i>Data collection, including sample location and choice of location</i> • <i>How the researcher responded to events during the study and whether they considered the implications of any changes in the research design</i> 	<p><i>Write comments here</i></p>
<p>7. Have ethical issues been taken into consideration? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If there are sufficient details of how the research was explained to the participants for the reader to assess whether ethical standards were maintained</i> • <i>If approval has been sought from an ethics committee</i> 	<p><i>Write comments here</i></p>
<p>8. Was the data analysis sufficiently rigorous? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If there is an in-depth description of the analysis process</i> • <i>If thematic analysis is used. If so, is it clear how the categories/themes were derived from the data?</i> • <i>Whether the researcher explains how the data presented were selected from the original sample to demonstrate the analysis process</i> • <i>If sufficient data are presented to support the findings</i> • <i>To what extent contradictory data are taken into account</i> 	<p><i>Write comments here</i></p>
<p>9. Is there a clear statement of results? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the findings are explicit</i> • <i>If there is adequate discussion of the evidence both for and against the researcher's arguments</i> • <i>If the researcher has discussed the reliability (credibility) of their findings</i> • <i>If the findings are discussed in relation to the original research questions</i> 	<p><i>Write comments here</i></p>
<p>10. How valuable is the research? <i>Consider</i></p> <ul style="list-style-type: none"> • <i>If the researcher discusses the contribution the study makes to existing knowledge of understanding</i> • <i>If they identify new areas where research is necessary</i> • <i>If they discuss whether or how the findings can be transferred to other populations or considered other ways the research may be used.</i> 	<p><i>Write comments here</i></p>

Appendix 3.1: Parent Survey

1. GENERAL QUESTIONS

Thinking about one of your children, please answer the following questions as best you can.

a. What gender is your child?

Male Female

b. What age is your child currently?

0-4 5-9 10-14 15-18

c. Approximately how many times a year does your child currently visit your local GP surgery?

0-2 3-5 6-9 10+

d. What does your child mainly require visits to your GP surgery for? Tick all that apply.

Routine/minor procedures (i.e. blood tests, vaccines, check-ups)

Regular but non-serious treatment (i.e. physiotherapy)

More serious treatment (i.e. cancer, cystic fibrosis)

Please indicate your answer by ticking the relevant circle.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
e. I considered my GP surgery to be modern and not dated.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. In general, my child doesn't mind visiting the GP surgery.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. In general, the surgery staff made an effort to make my child feel relaxed on arrival.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. YOUR GP SURGERY

Think about the child you have selected and any visits to a GP surgery when they have seen a healthcare professional for a routine check-up, a vaccine, blood test, illness diagnosis, receiving treatment, or anything else.

2.1 THE WAITING ROOM

Please state how much you agree or disagree with the following statements relating to the GP surgery waiting room. This includes everything from the decor, furniture, wall decorations, posters, reception desk, etc.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
a. My child felt amused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My child felt anxious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. My child felt bored.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My child felt courageous.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. My child felt doubtful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. My child felt excited.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. My child felt helpless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. My child felt interested.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. My child felt relaxed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. My child felt shocked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. My child felt tense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. My child felt trustful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.2 THE TREATMENT ROOM

Please state how much you agree or disagree with the following statements relating to where your child was treated (treatment room/doctor's office). This includes everything from the furniture, wall decorations, posters, healthcare professional's desk, etc.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
a. My child felt amused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. My child felt anxious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. My child felt bored.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. My child felt courageous.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. My child felt doubtful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. My child felt excited.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. My child felt helpless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. My child felt interested.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. My child felt relaxed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. My child felt shocked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. My child felt tense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. My child felt trustful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2.3 MEDICAL INSTRUMENTS

Please state how much you agree or disagree with the following statements relating to the medical instruments used at the GP Surgery. For example: items such as a stethoscope, syringes, blood pressure monitors, aural thermometers, etc.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
a. In general, the healthcare professional made an effort to make my child feel relaxed when the use of a medical instrument was necessary.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
b. I consider the aesthetic appearance of the medical instruments contributed to my child's emotional experience whilst there.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
c. In general, the medical instruments made my child feel amused.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
d. In general, the medical instruments made my child feel anxious.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
e. In general, the medical instruments my child feel bored.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
f. In general, the medical instruments made my child feel courageous.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
g. In general, the medical instruments made my child feel doubtful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
h. In general, the medical instruments made my child feel excited.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
i. In general, the medical instruments made my child feel helpless.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
j. In general, the medical instruments made my child feel interested.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
k. In general, the medical instruments made my child feel relaxed.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
l. In general, the medical instruments made my child feel shocked.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
m. In general, the medical instruments made my child feel tense.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
n. In general, the medical instruments made my child feel trustful.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. OTHER COMMENTS

Please rank in order of importance regarding what you think contributes towards your child's emotional experience at a GP surgery.

1 = most important, 4 = least important

Waiting room	
Treatment room	
Medical Instruments	
Staff	

Please can you write about a particular **positive** experience that you remember your child having while at your local GP surgery and why you think this was.

Please can you write about a particular **negative** experience that you remember your child having while at your local GP surgery and why you think this was.

Please add further comments you think relevant regarding visits with your child/ren to your local GP surgery.

Thank you for taking the time to complete this survey.

Appendix 3.2: Interview Schedule



Healthcare professional interview: children's emotional experiences in local GP surgery environments

1. GENERAL QUESTIONS

1. What is your profession within healthcare i.e. nurse, doctor, physiotherapist, psychologist, etc.?

2. On average, approximately how many children/young persons under the age of 18 do you deal with a week?

0-9

10-19

20-29

30-39

40+

3. Do you treat persons under the age of 18 for routine/minor procedures i.e. blood tests, vaccines, check-ups, physiotherapy rehab, etc.?

Yes

No

If yes, give examples: _____

4. Do you treat persons under the age of 18 for more serious illnesses i.e. cancer therapy, cystic fibrosis treatment, etc.?

Yes

No

If yes, give examples: _____

2. YOUR PLACE OF WORK

These questions relate to the environment you work in and the treatment of children/young adults. For example this can cover anything from a routine check-up, a vaccine, blood test, illness diagnosis, physiotherapy, to more serious cases such as administering treatment like dialysis/chemotherapy, etc.

2.1 THE RECEPTION/WAITING AREA

Please think about the reception and waiting area in the practice where you work when answering and answer for the following questions.

5. Do you consider the general decor suitable for young children and young adults or do you feel it is geared more towards the older patients (adults over 18)?

Prompts: wall hangings, decorations, posters, furniture, toys, magazines/books, TV - are there plenty of distractions available for them while they wait, is it a friendly or relaxing atmosphere etc.

6. Personally, are there any changes that you think could be made to the reception and waiting area at the practice where you work to create a more welcoming/relaxing environment for young children and young adults?

Prompts: are there any barriers/restrictions on what could be implemented?

2.2 THE TREATMENT ROOM

Please think in particular about the treatment room itself or one of the treatment rooms you regularly use for the following questions.

7. Do you consider this room to be suitable for young children and young persons under 18?

Prompts: e.g. does it come across as a friendly/intimidating/adult orientated environment? the general decor in this room suitable for young children and young adults wall hangings, decorations, posters, furniture? allow for persons of all ages?

8. If you could make any changes to allow it to be more suitable for those under the age of 18, what would these be?

Prompts: barriers/restrictions

2.3 MEDICAL INSTRUMENTS

Please think about medical instruments you use on a weekly basis (i.e. stethoscope, syringes, blood pressure monitors, aural thermometers, IV drips, dialysis machines, etc.) when answering and answer the following questions.

9. Do you consider medical instruments, in general, to be designed with any consideration for aesthetics (how it looks)?

Prompts: instruments patients see/use themselves, entirely functionally designed, same instruments used on children as for adults

10. Do you feel that the appearance of medical instruments could contribute to level of compliance with treatment when it comes to young children and young adults?

Prompts: could the sheer 'look' of it enhance or inhibit the likelihood of them complying with treatment that required the use of that instrument? Do you think medical instruments could be designed in a way that allows them to still perform the necessary procedure/task it is designed for but also be designed to be more aesthetically pleasing for young children and young adults?

3. OTHER COMMENTS

Could you describe briefly a particular *positive* experience you have had or any methods you personally have tried that *helped* children cope with healthcare environments or procedures when under the age of 18.

Could you describe briefly a particular *negative* experience you have had or any methods you personally have tried that *did not help* children cope with healthcare environments or procedures when under the age of 18.

Thank you for taking the time to partake in this interview.

Appendix 3.3: Interviewee Information Sheet



Children's experiences in primary care practices

INFORMATION SHEET

Primary researcher: Jennifer Day, MPhil Research Student, J.L.Day@lboro.ac.uk

Supervisors: Dr. Diane Gyi and Dr. Sue Hignett

The purpose of the study, who is doing it and why

My name is Jennifer Day and I am a research student at the Design School, Loughborough University, working in the area of design ergonomics, and this study is part of a student research project funded by the University.

I am researching children's experiences in local primary healthcare practices with the view to creating a set of design recommendations to help provide a more pleasurable experience for children and young people under the age of 18. This interview forms part of my data collection. It is an interview to understand, from a stakeholder perspective, views on the design of primary healthcare practice environments and medical equipment.

Please consider all your experiences that you have had with relevant projects including the methodology used,

With your consent and when applicable, the interview may be recorded using a dictaphone.

Personal information and confidentiality

The interview is voluntary and completion of the interview will be taken as your informed consent for the data to be used anonymously – no personal details are required. The views you express in this interview will be documented as your own personal views, and not that of the organisation you work for. The data is confidential but as a participant, if you have any questions or are interested in the overall outcomes of the project, please feel free to contact me at J.L.Day@lboro.ac.uk or on 01509 228313.

What if I am not happy with how the research was conducted?

The University has a policy relating to Research Misconduct and Whistle Blowing which is available online at [http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing\(2\).htm](http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm). Please ensure that this link is included on the Participant Information Sheet.

Appendix 3.4: Interview Consent Form



INFORMED CONSENT FORM

The purpose and details of this study have been explained to me. I understand that this study is designed to further scientific knowledge and that all procedures have been approved by the Loughborough University Ethical Advisory Committee.

I have read and understood the information sheet and this consent form.

I have had an opportunity to ask questions about my participation.

I understand that I am under no obligation to take part in the study.

I understand the interview will be audio recorded.

I understand that I have the right to withdraw from this study at any stage for any reason, and that I will not be required to explain my reasons for withdrawing.

I understand that all the information I provide will be treated in strict confidence and will be kept anonymous and confidential to the researchers.

I agree to participate in this study.

Your name _____

Your signature _____

Signature of investigator _____

Date _____

Appendix 4.1: Design Stakeholder Interview Schedule

Interview Schedule

Start with consent form and information sheet stating what will happen to the data etc.

Occupation/title/role: _____

Experience:

- | | |
|---|--|
| <input type="checkbox"/> Healthcare environments | <input type="checkbox"/> Healthcare products/instruments |
| <input type="checkbox"/> Product design for children | <input type="checkbox"/> Environment design for children |
| <input type="checkbox"/> Architecture (healthcare) | <input type="checkbox"/> Architecture (child related, i.e. school) |
| <input type="checkbox"/> Interior Design (healthcare) | <input type="checkbox"/> Interior Design (child related) |
| <input type="checkbox"/> Research | <input type="checkbox"/> Other (please specify) |
- _____

How many years' experience do you have as a practitioner? _____

Healthcare design and designing for children

- Examples of projects have you worked on? *(regards their experience stated above)*
 - o *Ask for a couple of examples*
 - o *How have any of these projects included design for children and/or healthcare environments?*
- How flexible or rigid are the design briefs you've had?
 - o *Do the design briefs tend to be purely functional? Product/environment serves a function and that is all it is to be designed for?*
 - o *Legislation/policy restrictions?*
- In your view, do you think it is always possible to adapt designs for different ages?
 - o *How do you adapt designs for different ages?*
 - o *How do you come to design decisions for products/environments aimed at different ages?*

- *What do you do differently for a product/environment aimed at toddlers, compared to a product aimed at teenagers?*
 - *Colours, textures, materials*
 - *Different levels of development and understanding*
 - *Do you take into account the types of feelings/emotions the target sample are likely to feel in response to products/environments?*
- *How much consideration goes in to the aesthetic appearance of product/environment (interior design)?*
 - *Colours, textures, materials*
- *RE architecture: is age a consideration at all when designing a building/environment? RE healthcare: Do they incorporate people of all ages? Do they allow for children in these designs?*
 - *Children of different ages have different levels of development and understanding toward healthcare – are these considered?*

Resources/tools/processes

- *What resources (if any) do you use during these projects?*
 - *The process that enables design decisions to be made*
 - *What in your experience has worked well/not worked well?*
 - *How much input does the main stakeholder(s) have?*
- *What are the main barriers you face when gathering the information you need to make the design decisions?*
 - *Opportunities for real user research?*
 - *Time constraints?*
 - *Restrictive design brief/guidelines/standards/legislation*
 - *In an ideal scenario, what would you want to be able to do that you can't do now? What do you think is needed? e.g. Less restrictive legislation? More time/money for research on projects? More input from end users?*

Close with:

- *Thank them for their time and input*
- *Remind them what will happen to the data*
- *Ask if they have any suggestions for other people to interview who might have an interest in this area?*

Appendix 4.2: Interviewee Information Sheet



Using design to improve the healthcare experiences for children and young persons in primary care practices

Information Sheet

Primary researcher: **Jennifer Day**, J.L.Day@lboro.ac.uk (Tel: 01509 223590)

Supervisors: Dr. Diane Gyi and Dr. Sue Hignett

The purpose of the study, who is doing it and why

My name is Jennifer Day and I am a postgraduate student at the Design School, Loughborough University, working in the area of design ergonomics. I am researching children's emotional experiences in local primary healthcare practices with the aim of creating design recommendations for both environments and products.

I contacted you to ask if you would be interested in contributing to my research by taking part in an interview. I would like to learn more about the design of healthcare environments and products for children and am specifically interested in:

- The types of research methodologies and methods used.
- The basis of design decisions and who makes them.
- Opportunities to conduct real user research.
- The restrictiveness of standards and regulations.

Along with relevant literature and my previous research, these data will be used to develop the design recommendations.

Personal information and confidentiality

The interview is voluntary and completion of the interview will be taken as your informed consent for the data to be used anonymously – no personal details are required. With your consent and when applicable, the interview will be audio-recorded. The views you express in this interview will be documented as your own personal views, and not that of the organisation you work for. The data is confidential but as a participant, if you have any

questions or are interested in the overall outcomes of the project, please contact me at J.L.Day@lboro.ac.uk or on 01509 223590.

What if I am not happy with how the research was conducted?

The University has a policy relating to Research Misconduct and Whistle Blowing which is available online at [http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing\(2\).htm](http://www.lboro.ac.uk/admin/committees/ethical/Whistleblowing(2).htm).

Stakeholder input in design processes and resources

Int. N°.	User	Client
RC1	<p><i>'And then some expert opinion and sometimes some user testing as well'</i></p> <p><i>'The poly-chair, for example, the plastic chair, I don't think there was any user involvement'</i></p>	<p><i>'Sometimes, like with the walk-a-dial there's a lot of input from the inventor, to try and steer us in the direction that he wanted us to go. So there was some input there. Normally, the strength is that we would do an independent evaluation, that's what we would offer, so there'd kind of be limited input from the stakeholders' 'So it varies?' It does, and it depends on the person with the money driving the decisions'</i></p>
RM1	<p><i>'Using the range of data sets from clinicians, healthy proxies and the real adolescent users'</i></p> <p><i>'I got 20 interviews within the hospital. Some were more successful than others!... they were a young user group population so I had to go through an NHS ethics process'</i></p> <p><i>'...they were a young user group population I had to go through an NHS ethics process' - 'Within that in the interview I used some vignettes that had been developed from the previous study as talking points really.'</i></p>	<p><i>'they take into account is if there's comparable products that have already been through it they can use the justification that the other product has gone through and theirs is replicating or on the same level, there are ways that they can give a justification so...'</i></p>
A1	<p><i>'The brief comes from extensive consultation with end user groups, however I believe that greater patient engagement is of benefit'</i></p> <p><i>'Access to patient groups is not always available. As designers we are inevitably pressured by delivering to cost and within tight timescales, which do not allow such consultation and design development and the results become bland or characterless'</i></p>	
A2	<p><i>'A parallel process of developing design goals that revolve around patient experience, staff experience and aesthetic goals'</i></p> <p><i>'The end user groups are sometimes included on advisory or review panels'</i></p> <p><i>'Staff have some (input) but patients have a limited input'</i></p> <p><i>'...shadow the users to find out how they work and use space... develop fictional "avatars" of those who use the space and develop a</i></p>	<p><i>'If the main stakeholders are the department leaders, they have a lot of input'</i></p>

Int. N°.	User	Client
	<i>narrative that explores their experiences as they use the space'</i>	
A3	<i>'Within the narrative (brief) there is described the needs of the physicians, staff and sometimes the patients'</i>	<i>'The main stake holders have a lot of input, but they are not always the right stake holders.' 'Bottom line is that the patients should always be our clients and as the designer you have the task to be a good listener and a good teacher to your stakeholders.'</i>
A4	<i>'In general the brief has been technical but in discussion with users and key senior personnel the design intent is developed and documented in the brief' 'I would say a lot of consideration goes into the end product by users but not often the users are true representatives of the whole operational group. Generally it produces a good result.' '...not often the users are true representatives of the whole operational group'</i>	
D1	<i>'They are not shy to express what items in their space do not work and what does. It is sometimes much more important to ask what doesn't work versus what does work' 'In some cases, staff/child life specialists have already conducted informal surveys of patients. This is typically in the form of questionnaires involuntarily filled out after a visit' 'It if is a large hospital group there may be child life specialists who can become an integral part of the design' 'It is very rare that there is time/money to invest have design sessions with end users/patients'</i>	
D2	<i>'We work hand in hand with our users to understand their work process, not just to remake it in a new facility, but to move through the process from that baseline and bring them into a new environment with an improved care/work process' 'Briefs in the US are general, with focus on project delivery rather than user and functional requirements'</i>	
M1	<i>'They (patient participation group) meet monthly, it's an entirely</i>	<i>'What it looks like and what you put in is a combination of the</i>

Int. N°.	User	Client
	<p><i>voluntary thing. The practice go along to the meetings as well, they have their own chairman and set their own agenda where we report back our news and they help us with decisions and things we need to think about like new premises or appointment systems, or can we better support chronic diseases, all these things'</i></p>	<p><i>practice working with the architects normally I would say.'</i> <i>'Although again the PCT have a role in monitoring the premises. The care quality commission will have an impact as well on the decisions that practices make so in terms of children's waiting areas and children's toys it's not that you can't have them it's just that you need to make sure that you have a cleaning schedule for them.'</i> <i>'The relationship is between the practice and the primary care trust at the moment'</i> <i>'So really the PCT give the OK to the plans we draw up but in reality what you do is, architects who do medical centres are incredibly aware of all the different regulations you have to meet so you place your reliance in them working with the PCT and also our knowledge about what conditions we're going to have to meet under the care quality commissions. And the DDA'</i> <i>'So it's a two way process, you take advice but its practice led really'</i></p>
C1	<p><i>'I use a lot of immersion techniques'</i> <i>'So we often create personas and then try to immerse ourselves as if we're actors playing a part of a persona, by trying to get in to the persona's head'</i> <i>'But again try to immerse ourselves in the world of the persona'</i></p>	<p><i>'...ultimately it's them that are going to make the decision on what they're going to do. They let you suggest fairly openly but it's up to them what they're going to do'</i></p>

Requirements during design processes and resources

Int. N°.	Standards and guidelines	Aesthetic and functional requirements
RC1	<p><i>'A lot of the recommendations that we make are based on standards and regulations that exist, so we'll look at them to make our regulations'</i></p> <p><i>'So our input would mainly come from standards and regulations, other reports that looked in to designing and developing products for kids, other experts that have done stuff with kids, and we would look at best practice methods and apply them to whatever it is we're evaluating'</i></p> <p><i>'Because you never have a specific standard for a product, it's kind of generic standard'</i></p> <p><i>'Take different parts of different standards and applied them to the product and say whether it complies or not'</i></p> <p><i>'Sometimes, they're not aware and sometimes there's not a specific standard that applies'</i></p>	
RM1		<p><i>(Do you think there's definitely flexibility there for when it comes to the look and the aesthetics like the colours, the materials, things like that, that the product is made out of? So how looks and feels, do you think there's flexibility there within the standards?) 'Oh yeah I think as long as they can justify it'</i></p>
A1		
A2	<p><i>'Of course there are regulatory standards that we must adhere to'</i></p>	<p><i>'A paralleled process of developing design goals that revolved around patient experience, staff experience and aesthetic goals'</i></p>
A3		<p><i>'A functional program listing rooms and square footages by function'</i></p>
A4	<p><i>'There are design guidelines for hospitals but not for Community Centres or children's facilities'</i></p> <p><i>'The Brief usually contains the requirements of the Department of Child and Community Services'</i></p> <p><i>'The Brief would always require the Building Code of Australia to be compiled with'</i></p>	<p><i>'In general the brief has been technical but in discussion with users and key senior personnel the design intent is developed and documented in the brief'</i></p>
D1	<p><i>'If the facility falls under the FGI guidelines for that state the facility program is definitely restricted by that states guidelines for example in</i></p>	<p><i>'Yes they (design briefs) mainly serve as a functional program to the needs of the patients and staff'</i></p>

Int. N°.	Standards and guidelines	Aesthetic and functional requirements
	<i>an ASC'</i>	
D2	<i>'There's usually a reference to mission of the institution and the standards if any'</i>	
M1	<p><i>'Well increasingly their biggest governing, over arcing view of what a GP consulting room looks like is the care quality commission and the standards that 'they will expect us to hit and we have to register to show compliance. '</i></p> <p><i>'We also got a responsibility in terms of DDA and increasing the care quality commission we also be looking at standards of premises' - 'it's a two way process but ultimately we have to meet the standards that they want us to meet'</i></p> <p><i>'Obviously you need seats these days that you can wipe down and keep clean for obvious reasons'</i></p> <p><i>'Look at the care quality commission; they will govern waiting room policy for most surgeries that make any decisions in the next 12 months. Or fear of them!'</i></p>	<p><i>'Obviously you need seats these days that you can wipe down and keep clean for obvious reasons'</i></p> <p><i>'We take guidance in areas that we aren't wonderful at 'so in terms of colours and things like that, and artwork is primarily the practice'</i></p> <p><i>'Our strategy in the new waiting area, is for it to be relaxed, very clean, very smart looking'</i></p>
C1		<i>'...there was a lot of effort that went in to calming patients using colours and soft forms and trying to make things non tube like'</i>

Age differences

Int. N ^o .	Cognitive and physical	Aesthetics
RC1	<p><i>'I think you can do it because you've got different development stages with kids, so their motor capabilities change radically'</i></p> <p><i>'Cognitively kids develop fast as well'</i></p> <p><i>'I've not specifically been asked to look at anything that looked at different emotional aspects of children's products and how you can make this appeal to kids on different levels', 'With the school plastic polymer chair for example, the standards stipulated that they had to be, I can't remember but I think it had to be 5 or 7 different sizes of chairs, to cater for between 5 and 16 year olds'</i></p> <p><i>'But if you got for something quite innovative you could have a product that's quite adaptive and fits a range of sizes, but that increases the cost and it's not commercially viable.'</i></p>	<p><i>'I only know from the stuff that it each that they tend to go, something like, it's not until the age of 3 that they distinct that boys prefer blue and girls prefer pink. Before that its hot fluorescent colours, so you get bright yellows, bright greens, bright oranges'</i></p> <p><i>'From what I know from the research, there's different colours that appeal to different age groups. But I've never been directly asked to evaluate or recommend colour. You could colour code for age groups, yeah, that seems sensible.'</i></p> <p><i>'I've looked at stuff for kids under the age of 3, my nephew who's 2 at the minute, and all the colours, he's got a lot of stuff that bright yellow, bright green, bright oranges. And then that kind of changes as they get a bit older.'</i></p>
RM1	<p><i>'This might be more so with younger adolescents, one thing that they liked, they all wanted a bit more feedback so say if this device is being used by someone else but they've almost got a graph that they can have a look at, it doesn't necessarily mean anything to them in terms of the clinical result'</i></p> <p><i>'I think by that point they (older adolescents/later teens) are maybe getting more of an appreciation of the benefit, that health benefit might outweigh some of the aesthetic things because it's a case of it doesn't look great but I know it's going to do me good kind of thing. So maybe it's just the maturity level and understanding of their condition and why the use of it or it's being used on them'</i></p>	<p><i>'Just the physical look isn't there, but I think aesthetics as well can also go into the engagement and the feedback, that kind of side'</i></p>
A1		
A2	<p><i>'One must also take into consideration emotional and physical maturity and challenges of a specific group. This will help to guide decisions about how much and what type of sensory stimuli will best help the patient heal, what will help them make sense of their environment and what will help them take feel in control and comfortable'</i></p>	<p><i>'Colours, patterns and textures have to be selected with this in mind. Furniture and decor have to be selected to appeal to the age of the population who will use it.'</i></p>

Int. N°.	<i>Cognitive and physical</i>	<i>Aesthetics</i>
	<i>'Visual acuity is different in children, adults and the elderly.'</i>	
A3		<i>'Age of the patient population is always considered in our designs and yes we use brighter colours, scaled furniture.' 'Materials and textures are not always that different in that they must all be equally easy clean and to maintain in a good condition.'</i>
A4	<i>'Children's hospitals have taken special care to make sure the environment is interesting and stimulating with fish tanks, hanging objects, places to sit outdoors and places to engage while waiting. These are not the sort of places that adults waiting for a procedure who need distraction from pain are likely to find useful.' 'Adolescents are a major concern in hospitals these days as they are there longer for repeat occasions of service. They need to have entertainment and schooling activities so these require specific spaces.'</i>	<i>'As I have outlined before the age is critical to making an appropriate environment and certainly the colour the texture and the configuration of space such as observation, places to relax and to be with family are all quite often age specific.'</i>
D1		<i>'Smaller children also love to experience different textures and teens typically like to visualize these textures'</i>
D2	<i>'For children, the ergonomics of the product and the safety considerations should be highly considered. Empowering a child to do for himself is a great objective, especially when he/she is so out of control of their lives in a healthcare setting.'</i>	
M1		
C1	<i>'Well the emotional side I suppose, and the cognitive in terms of informing people' '...she found that dentistry tools often frighten children'</i>	

Interviewee experience when designing for different ages

Int. N ^o .	Interviewee experience
RC1	<p><i>'I think in my opinion you can only design for specific age ranges'</i></p> <p><i>'So, in my head, there are a number of things you've got to kind of hit with children's products as a whole. You've got kind of this education element that you have to fulfil, you've got this fun factor that you've got to fulfil, and you've kind of got to keep them engaged for a reasonable amount of time, otherwise it's kind of a waste of money if the kids aren't going to use it for a long time'</i></p>
RM1	<p><i>'I think there is the perceptions that if a medical device is not appealing it can give off quite a scary vibe to people that don't know because obviously its unknown isn't it. I would say in terms of that question actually that naïve adolescents are quite interesting to talk to because they weren't satisfied with current device design'</i></p>
A1	<p><i>'The NHS define a child as being up to 18 years of age. This has a huge implication when designing for such a wide range. I personally believe that the challenge for designers is to provide an environment which can be accessible and responsive. Often defining 'zones' in which children and young people can feel comfortable. Often when children are being designed for, the immediate response is to plaster walls which cartoon characters or bright garish colours which alienate and discourage older children'</i></p> <p><i>'Although there are perhaps some general principles that can be applied, the design must be a response to the need. It is the designers responsibility to interrogate the brief and to gain an understanding of the functional requirements, from which a positive design response can emerge'</i></p>
A2	<p><i>'I can't say that anything is always possible and it depends on what one is designing'</i></p> <p><i>'In a large hospital, it makes sense to establish a basic size and framework for the patient room and then customize it to the specific needs of the population that will be using a floor'</i></p>
A3	<p><i>'Separating the frail elderly patients from the children is key'</i></p> <p><i>'Certain designs are never adaptable nor necessarily appropriate for all ages'</i></p> <p><i>'Design for different ages in waiting rooms for instance takes on a challenge' - 'Then even amongst all the ages from 2 to 17 there varied needs and demands, from wall mounted toys to iPods and video games. Bringing positive distractions which captivate the very young to the young adult can be an aquarium, or fire place, whether real or digital. Even scenes of nature in motion can capture the imagination. Rooms can have features which can quench their curiosity'</i></p> <p><i>'The general decor tends to be more playful with feature which might otherwise provide too much visual disturbance in elderly populations. This is if you are designing for a specific population. If you are designing one facility which tends to all ages then the design is geared for all, a more universal approach.'</i></p>
A4	<p><i>'Normally I design for the specific purpose of a facility and accommodate the other age groups within that'</i></p> <p><i>'However in health facilities the symbolism that is generated by different spaces are responded to differently by different ages'</i></p> <p><i>'In an aged care facility in which you are trying to evoke spaces that are comfortable for older people there is potential to have spaces that allow for visiting children and animals which all ages like to see or touch'</i></p> <p><i>'I don't think it is possible to completely adapt a design to any age group successfully as places evoke specific responses that need to used'</i></p>

Int. N°.	<i>Interviewee experience</i>
	<i>to create a therapeutic place'</i>
D1	<p><i>'It can be achieved by strategically placing design elements. This is key in any paediatric environment as many practices see age ranges from 0-sometimes 19'</i></p> <p><i>'Another option to consider would be to have certain areas separated for varying age ranges such as a space for younger children sectioned off from an area for teens.'</i></p> <p><i>'First you need to consider safety in any case for both children and adult in the built environment. This comes into play especially with the stability of furniture and also the way the piece is put together'</i></p> <p><i>'That said, all surfaces must be easily cleanable.'</i></p>
D2	<p><i>'The staff for example are a consistent force in the healthcare environment that has to be taken into account'</i></p> <p><i>'We can accommodate the needs of paediatric, adult and geriatric population within the same area requirements, but the character of that space is essentially different. The children's environment must meet the requirements for their adult parents and geriatric grandparents. To some extent all healthcare users have needs for distraction, support, quiet and access. We cannot forget about the adjunct users to only focus on the patient.'</i></p> <p><i>'Safety features will allow anxious parents to give this opportunity to their children.'</i></p>
M1	<p><i>'We work quite closely with our patient participation group as well so you'll see some of their literature in the waiting room so we ask them what they think as well.'</i></p> <p><i>'It is increasingly governed by the care quality commission so in a GP room is different to a treatment room, I think a treatment room you wouldn't expect to see anything other than a treatment couch, even a desk and chair you have to look quite carefully at now. it's a constant battle, at the moment what we will do we will have a dialogue with the GP's and it will go we'll have to have a strategy for anything we do want to put in to maintain infection control and at some point it may be that what we want to do, in terms of entertainment, we can't do anyway, but we'll have to wait and see how, what the requirements say exactly and getting a balanced approach. We want to be a compliant building when we move down the road.'</i></p> <p><i>'In terms of entertainment for everybody we come up with anything we can, but it's got to be obviously within reason and control.'</i></p>
C1	

Resource barriers

Int. N ^o .	Time/money	User involvement
RC1		
RM1		<p>'Yeah and it's right away from the start it's just extra justification for asking that younger user group, why would you do this when you can ask adults and it's like well they're different! '</p> <p>'And that itself I think is quite a hurdle for people developing medical devices and probably environments as well, to get data from young users it's a problem.'</p>
A1	<p>'Time - Inadequate time allowed in programs for design development and engagement. Cost - The budget allocation for the build, together with the restrictions on fee levels, tend to place limitations on the designers input. '</p>	<p>'I think what leads to a successful design response, is greater end user engagement, greater allowance for design development (with appropriate fee allowance) a more flexible approach to legislation (HBN's , HTM's).'</p>
A2	<p>'Time and money are always an issue and probably the biggest issue.'</p>	
A3	<p>'Time and money are the biggest constraints. '</p>	
A4	<p>'They want this to be done quickly and don't really expect to have research undertaken in the project time.'</p>	<p>'I do however engage facilitators to work with client groups to come up with ideas that are innovative gaining an understanding of what the client experience is with the current building or the building that is to be created.'</p>
D1	<p>'Money now is always an obstacle to incorporating 'nicer' design elements into space.'</p> <p>'Depending on the client time is always an issue whether it be product availability, design time, construction time, or budget to pay design professionals to do their job.'</p>	
D2	<p>'time and fee allowance for research and development is always a challenge, and seems that clients do not value it or consider it outside of the traditional scope that they are willing to pay for.'</p>	
M1	<p>'It's a practice budget. So dependent on the practice.'</p>	
C1		

Barriers faced due to input from stakeholders or standards and legislation

Int. N°.	Stakeholders	Standards/legislation
RC1		
RM1	<p>"The companies I tried to (get interaction with), but their view point was quite... basically I got told that theirs was the best that was on the market. But it was a case where they were quite dismissive of... not as open-minded as you'd maybe like to think!"</p> <p>'There is a reluctance to modify things based on if it works and it ticks the boxes...'</p>	<p>'I think the legislation probably is a bit of barrier but with this one it now formalises all of the processes so you'd hope that from here on out there isn't a case of they can void it so they have to go through the process a bit better and although that's restricted to usability it doesn't actually incorporate your interest of the emotionally side, less tangible but equally as important for adoption and acceptance.'</p> <p>'I guess the other thing that is a barrier and I would say for research, academic and industrial is navigating the ethics, it was quite difficult at times. So you can see why people don't want to involve under 18's or under 16's in their research processes because it's such a process.'</p> <p>'I think previously it would have been time and money because they could have got away with putting a device on the market that was clinically effective but hadn't any usability testing. And previously it was a case of get it out quick but now I think because this new regulation, I think I was 2008 but only really now kicking in, that will change that side of things. But then that is only limited to usability. '</p>
A1		'I think what leads to a successful design response, is greater end user engagement, greater allowance for design development (with appropriate fee allowance) a more flexible approach to legislation (HBN's , HTM's).'
A2	'In many instances, the hospital administration is not willing to listen to input from patients.'	
A3		'ALWAYS remember that the standards and legislations are the MINIMUMS. If you strive for excellence in paediatric healthcare facilities and you cannot design within codes and beyond the minimums then we have got a BIG problem.'
A4		
D1		
D2		'Institutions that are very restrictive about their purchasing agreements

Int. N°.	Stakeholders	Standards/legislation
		<i>and standards are difficult, because they leave potential solutions aside.'</i>
M1		<i>'So you know there's constant debate around things like books for children. Children when they come in some of them aren't very well, they look at a book, do you have a cleaning schedule for that? So do you then not have a book..? * Well there must be, there has to be a sensible approach. Whether that's employed by the people who govern overall, is really the question. It'll be the care quality commission are the people; they are essential standards on what they expect to see. But then that's about, as I said earlier, I think having children's toys in waiting rooms is fantastic, its then making sure you have a strategy that's acceptable to them.' - 'The biggest one is you can't have fabric. And that looks clinical whatever you do! There are standards around the fabrics you can have. Furniture is a two way thing between architects and practice. Normally you go to a company who supply waiting room furniture and you choose from their range.'</i>
C1	<i>'...ultimately it's them that are going to make the decision on what they're going to do. They let you suggest fairly openly but it's up to them what they're going to do'</i>	