An investigation of the barriers to referral in child protection for dental team professionals through serious game design.

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Abstract

The involvement of the dental team in child protection and safeguarding was initially reported in the scientific literature in the 1960s and 1970s. One of the current concerns is that despite at least 50 years of research, there remains a worldwide ‘gap’ between suspicions of child abuse and neglect by members of the dental team and the reporting of those suspicions appropriately. Current approaches to the teaching and training of the dental team in child protection and child safeguarding may not be reducing the gap and overcoming the reported barriers to closing the gap that have been identified in the literature. This research project investigates how serious games might provide an effective support for teaching and training of dental team professionals in child protection. Following a triadic game design approach all the factors related to the referral of child protection concerns by dental teams in Scotland were explored by a comprehensive investigation of the literature and by qualitative in-depth interviews with dental team professionals throughout Scotland. The interviews were thematically analysed, and all themes considered as potential areas for intervention. This is the first study of this type done with dental team professionals in Scotland. One of the overarching themes identified was that of fear and this was identified as the priority area to be targeted. Based on these results a serious game intervention to support the teaching and training of child protection/safeguarding to dental team professionals was then designed and created using Learning Mechanics-Game Mechanics. No previous examples of a game targeting this area have been reported. Finally, this serious game intervention was play tested and evaluated with dental students by way of pre- and post-test questionnaires, the Game Experience Questionnaire and focus groups, which again has not previously been reported. These provided evidence that the game was fit for purpose.

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Preface

When I began this PhD study I had no children and now I have 2. Becoming a mother while doing research in the field of child safeguarding has given me new insight and understanding and has also been immensely challenging. Part time PhD study is not really set up with maternity leave in mind! During this time, I also completed my paediatric dental training, moved house twice and dealt with serious family illnesses, and then the coronavirus pandemic came along. The pandemic reduced access to health services and being on maternity leave I saw this first-hand as health visiting appointments became telephone only from when my youngest child was 4 months, meaning my youngest, who is now almost 21 months has not been seen by his health visitor since before the first lockdown. As a 2nd time mum with good support, I realise we are in the low priority group, but it does make me wonder how many more children are potentially experiencing abuse and neglect in these unprecedented times where they have had reduced contact with the outside world. To add to this not all dental services are back up to their full potential meaning that many children have not seen their general dental practitioners for nearly 2 years now (my eldest included), unless they have had problems. I have been interested in the field of child safeguarding ever since I was an undergraduate dental student and volunteered as a counsellor with ChildLine. That opened my eyes to what some children experience and made me want to do something to help. I am under no illusion that my work is going to solve all the problems, but I do hope it does go some way to helping and makes the world a slightly better place for my children and all their current and future friends. The potential impact of reducing child abuse and neglect, or even intervening earlier, is huge not only to the child, their family but also to society and our healthcare system.

Acknowledgement

This project would not have been possible without the help, support, and encouragement of my two supervisors Dr Sandy Louchart and Prof Richard Welbury. Sandy took over from my previous supervisor who left, and I really could not have asked for better. Nothing has ever been too much of a problem and he has kept me on an even keel and guided me through the world of serious games. I cannot properly express my thanks in words, but I am truly grateful from the very bottom of my heart. Richard has been there since the very beginning of my career as a paediatric dentist, and I have a new appreciation of his patience as my door is now one of the ones the training grade staff knock on to ask their questions and talk through problems. He has been the most wonderful role model and if I'm ever even half as successful as him I will be doing very well indeed. My very grateful thanks to Richard, especially as this project had been keeping him from being fully retired so now that it is done I hope you get to enjoy your retirement properly. My English will never be as good without your eagle eye!

A huge thank you to my long-suffering husband Chris, without him this research just would never have been completed. He has stepped up with emotional and physical support and listened when I've been frustrated, confused, upset, angry and just generally wanting to throw the towel in. Since we became parents, he has taken on the role of being a full-time dad and without that I just could not have continued working full time and doing a part time PhD. I'm sure he is as pleased as I am that I'm finally finished.

I would also like to thank all the dental team professionals who agreed to be interviewed, those who helped me validate my evaluation questionnaire and those who play tested my game, the undergraduate students who played my game and those involved in the evaluation. Without all of them my research would not have been possible.

Finally, a huge thank you to my children, Eleanor and Callum, for understanding when mummy was busy. My mum-guilt is very real, but I hope you will be proud of me, and maybe read this when you are a bit older.

Author's Declaration

I, Christine Marion Park declare that the enclosed submission for the degree of Doctor of Philosophy and consisting of this thesis and the artefact of the serious game developed in this research meets the regulations stated in the handbook for the mode of submission selected and approved by the Research Degrees Sub-Committee.

I declare that this submission:

is my own work, and has not been submitted for any other academic award.

Signed: Christine Marion Park Date: 31/08/2021

Student _____ _____

Supervisor Support

Signed: Dr Sandy Louchart Date:31/08/2021

Supervisor
_____ _____

Definitions/Abbreviations

BLS	Basic life support
CAN	Child abuse and neglect
CPD	Continued professional development
CP	Child protection
CPA	Child protection advisor
Dental team professionals	Individuals who work within a dental team either in general dental practice, community dental service or the hospital dental service and can be a dentist, dental nurse, dental hygienist, dental therapist, dental receptionist, or practice manager
GDC	General Dental Council
GDP	General dental practitioner
GEQ	Game Experience Questionnaire
GP	General medical practitioner
GSA	Glasgow School of Art
IRAS	Integrated Research Application System
LDC	Local area dental committee
LM-GM	Learning mechanics- Game mechanics
NES	NHS Education for Scotland

NHS	National Health Service
NSPCC	National Society for the Prevention of Cruelty to Children
REC	Research Ethics Committee
R&D	Research and development
SIMD	Scottish Index of Multiple Depravation
TGD	Triadic game design
UK	United Kingdom
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
USA	United States of America
VT	Vocational trainee
WHO	World Health Organisation

Chapter 1 Introduction

1.1 Introduction

There are many decisions that dental team professionals must make. Some are straightforward and are done every day (e.g. deciding on what material to use to restore a tooth or when to refer for an opinion from a specialist), however there are others that are less common but more difficult such as: when to save or extract a tooth where the tooth is saveable but a patient cannot afford the necessary root canal treatment; what to do when a patient is anti-fluoride but has active dental disease and insists they have a low sugar diet; or how to deal with colleagues who appear to be under performing. These types of decisions could have far-reaching consequences for the dental team professionals and their patients. An extreme case is the decision whether or not to refer a paediatric patient because of suspicions of child abuse or neglect (CAN). The involvement of the dental team in child protection and safeguarding was initially reported in the scientific literature in the 1960s and 1970s (Cameron et al., 1966, Becker et al., 1978, Casamassimo, 1986). Since then, much has been published about the involvement of the dental team in identifying and reporting cases of CAN. The current concern is that despite at least 50 years of research, there remains a worldwide gap between suspicions of CAN by dental team professionals and the reporting of those suspicions to appropriate authorities (full review and discussion of the literature regarding this can be found in Chapter 2, Section 2.2). This is an important and surprising fact and other healthcare, and education professionals are also known to not always refer cases of suspected child abuse or neglect. Current approaches to the teaching and training of the dental team in child protection and child safeguarding may not be reducing the gap and overcoming the reported barriers to closing the gap that have been identified in the literature (see Chapter 2, Section 2.2.2) and which are summarised in Table 1.1 It may be that previous research has not included a comprehensive understanding of the problem on behalf of the dental team professionals themselves.

Table 1.1 Barriers to Referral

Barriers
Fear of wrong diagnosis/ getting it wrong
Lack of certainty of diagnosis
Insufficient knowledge of how to report
Don't know how to take history of a suspicious injury
Lack of knowledge of signs/ symptoms of child abuse and neglect
Fear of parental response
Fear of Consequences to child
Fear of Negative effects on child's family
Fear of Family violence to child
Fear of Family violence to dentist
Fear of Concerns about losing patient/ family
Fear of trouble with authorities
Concerns about confidentiality
Fear of litigation
Fear of consequences to child from statutory agencies/ uncertainty of consequences
Lack of confidence in suspicions
Fear of being identified as the reporter
Lack of confidence in child protection service
Lack of time

The first part of this research project will investigate what is already known about the barriers to referral for dental team professionals and add to existing knowledge by gathering rich and deep data from them by in-depth qualitative interviews. This research method is poorly represented in the current literature on this topic. We expected fear to be a recurrent theme and believed that in-depth interviews would give us a greater understanding of the fear.

The next stage of this research project is to investigate how serious games might provide an effective support for teaching and training of dental team professionals in child protection. The triadic game design approach put forward by Harteveld (2010) is an established method in the field of serious games and is

an appropriate way to investigate this (Troiano et al., 2020, Lukosch et al., 2018). Triadic game design concerns the design of games, especially serious games. It discusses the worlds of reality, meaning, and play, and how all three worlds must be balanced in an efficient game. In triadic game design games are taken as a set of interacting elements that work together based on rules to provide players/participants with a purposeful experience. When considering child protection or safeguarding there is a set of interacting elements, namely organisations and individuals, that form an integrated whole, in this case the child protection system, and they have a common goal/purpose which is to protect children and safeguard their wellbeing. Removing or transposing any of the interacting elements would mean that the system would not function properly. Harteveld argues this is true for games and my observation is that it is certainly very true in child protection where significant case reviews (carried out after a child death or a potentially serious incident) identify common shortcomings including: inadequate sharing of information; poor assessment process; ineffective decision making; a lack of inter-agency working; poor recording of information; and lack of information on significant males (for example the child's biological father or their mother's partner) involved in the child's life (https://learning.nspcc.org.uk/case-reviews/national-case-review-repository). All of these can occur when the "worlds" of child protection/ safeguarding are not balanced.

Before starting this research, it was acknowledged that the author's 'model of reality' as an experienced paediatric dentist and active researcher and teacher in child protection, would not be the same as the 'model of reality' of a general dental practitioner, hygienist/therapist, or dental nurse. Harteveld notes that physical world representations can be used to illustrate, clarify, symbolise, or experiment. These can re-engage people with reality and allow them to look at the world from a different perspective. To create the 'model of reality' it is necessary to know the problem, the factors (who or what is involved), the relationships (relating the factors to each other) and the process (how the relationships change over time). The perceived problem is that not all dental team professionals refer suspicions about child abuse/neglect. This may relate to the understanding of what 'refer' means in this case. Designing a game is one way to address the problem but we had to ensure that this was appropriate. To

do that it was necessary to investigate what other measures had been considered or used as well as reviewing the existing legislation and policies surrounding child protection and safeguarding in dentistry.

Using games for continuing professional development for healthcare workers is not new and they have also been used in training for safety and crisis response. Child protection comes under the umbrella of safety and crisis response in some circumstances and using games enables professionals to get experience in a relatively safe environment. There are also games aimed at the strategic/ tactical level where players are challenged to co-ordinate a multi-agency response, thus responding appropriately to the situation by taking the right actions and communicating effectively. This may be helpful in child protection as those involved in child protection may be tasked with co-ordinating many sources of information from many agencies.

Additionally, games have been reported as a good tool for education as they fit with many educational philosophies. Games can make topics come alive and let students apply knowledge and skills in settings where they are actually needed (Shaffer, 2007). Kolb (1984) noted that seeing something and acting upon something are different ways of processing information and acting upon something is most likely to lead to a much deeper processing of it. For those who have never had experience with child protection gaining experience is difficult. Perhaps a game could provide this experience and in a more immersive way than current scenario-based teaching? Professionals “actually engage” with games (Gee, 2007) so they provide a quality and contextualised collaborative experience through which the professionals can explore and reflect on cases and benefit from each other’s views, perspectives and interpretations. It is interesting to consider whether they would then be more likely to detect abuse or neglect than if they have just heard about signs and symptoms or read about them, however there is no current evidence of this in the literature and this is beyond the scope of this project. It is certainly an area for potential future work.

In summary we aimed to develop a serious game following the triadic game design model, for use in the teaching and training of dental teams in child protection and safeguarding. The game focussed on giving players confidence in

decision making and helping them to overcome their fears regarding referring. We aimed to test it with dental students, serious games students and qualified dental team professionals before evaluating it with undergraduate dental students in Glasgow Dental Hospital and School. This thesis offers a methodological exploration of the factors affecting referral of child protection concerns by dental team professionals and an investigation of the development of a serious game solution. The use of in-depth interviews to explore these factors with dental team professionals in Scotland has never been reported in the literature and so this thesis adds to the body of knowledge that is explored in the literature review. The development of a serious game in child protection in dentistry is also novel.

1.2 Research Question

What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?

1.3 Research Aim

Given the research in the field of child protection/ safeguarding in dentistry and the research in serious games we believe that a serious game could support training in child protection/ safeguarding for dental team professionals. As such the aim of this research is to investigate whether a serious game can provide an effective support for child protection/ safeguarding training for dental team professionals.

1.4 Research Objectives

1.4.1 Objective 1

Investigate thoroughly the factors related to referral of child protection concerns by dental teams in Scotland and prioritise them (Chapters 2 and 4).

This objective contributes to the overall aim by ensuring full understanding of the current barriers to referral of child protection concerns for dental team

professionals. It applies to the model of reality in the triadic game design approach.

1.4.2 Objective 2

Understand the issues from the perspective of dental team members practicing in Scotland (Chapter 4).

This objective contributes to the overall aim by investigating what the issues are for currently practicing dental team professionals and looking for missing knowledge, namely what the identified barriers mean outside of the academic debate or if they translate into the real world. In this objective we aim to map the complete spectrum of opinions and experiences that dental team professionals report regarding child protection. The research findings in the context of existing theories and knowledge will give us our model of reality from the triadic game design approach as “reality is interpreted, constructed, and translated into a model by a group of designers in collaboration with others”(Harteveld, 2010). In this case the collaboration is with dental team professionals participating in the interviews.

1.4.3 Objective 3

Investigate suitable pedagogic practices for approaching and intervening on these factors (Chapters 2, 3 and 5).

It is important that the factors identified in objectives 1 and 2 are addressed. This objective (objective 3) contributes to the overall aim by ensuring the serious game is grounded in suitable pedagogy. This is part of the model of meaning in triadic game design.

1.4.4 Objective 4

Investigate and develop a serious game approach to support the delivery of teaching and training in child protection/ safeguarding to dental professionals based on the evidence gathered in objectives 1 and 2 (Chapter 5).

This objective feeds into the overall aim of the research as the game designed needs to be developed with appropriate learning outcomes. This is an important part of the model of meaning in triadic game design.

1.4.5 Objective 5

Evaluate the serious game developed in the research (Chapter 6).

This objective feeds into the overall aim which was to investigate whether the serious game we designed could provide an effective support for child protection/ safeguarding training for dental team professionals. The evaluation provides evidence of whether it is effective. This objective applies to both the model of meaning and the model of play of triadic game design.

1.5 **Summary of methodology**

1.5.1 Overall approach

The research methodology of this research (Figure 1.1) used the triadic game design approach (Harteveld, 2010) to investigate all the factors related to the referral of child protection concerns by dental teams in Scotland by a comprehensive investigation of the literature and by qualitative in-depth interviews with members of dental teams across Scotland. A serious game intervention was designed and created to support the teaching/training of child protection/safeguarding to dental professionals. Finally, this serious game intervention was evaluated to see if it was fit for purpose.

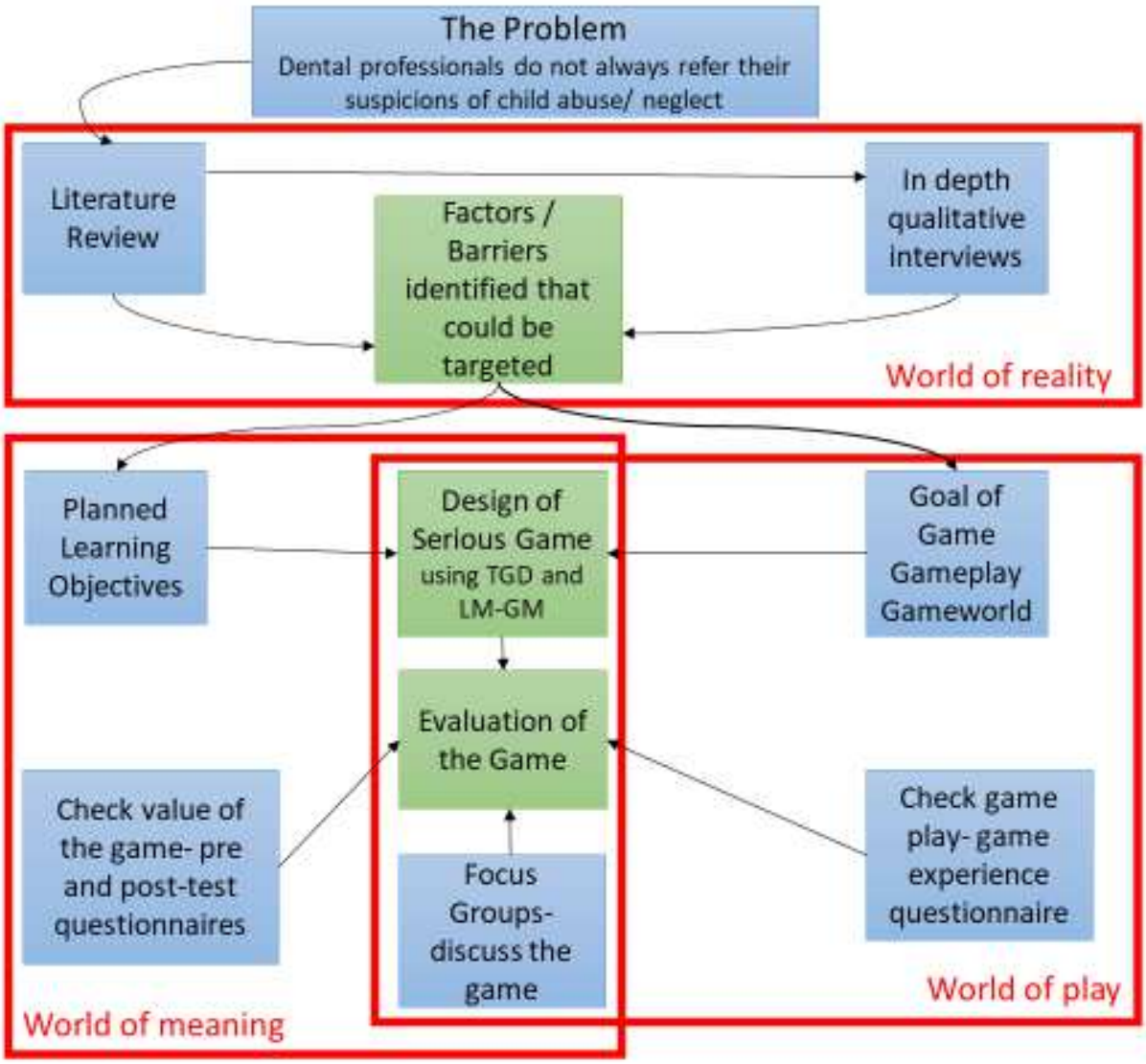


Figure 1.1 Summary of Research Methodology

1.5.2 Qualitative in- depth interviews

Qualitative in-depth interviews were used as the method of investigating the experiences and perceptions of dental team professionals in Scotland with regards to child protection to address Objective 1 and Objective 2. The problem of a 'gap' between suspecting child abuse and neglect (CAN) and referring to appropriate professionals is complex and sensitive. Investigating this 'gap' needed the researcher to be able to gather rich and complex data of the participants experience, hence in-depth qualitative interviews were judged to be suitable for this. The process of analysis of these interviews is summarised in Figure 1.2.

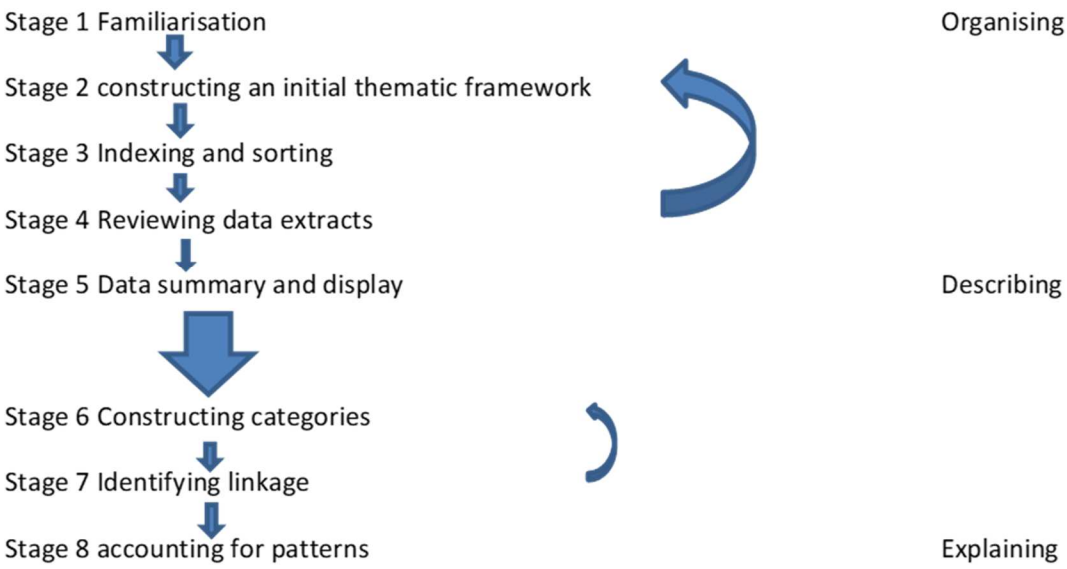


Figure 1.2 Summary of Process of Analysis of In-depth Interviews

1.5.3 Serious game approach

The triadic game design approach along with Learning Mechanics-Game Mechanics were used to design a serious game intervention to target the outcomes of the in-depth interviews and utilising the model of reality developed from the literature review and the in-depth interviews. This addressed Objective 4.

1.5.4 Evaluation approach

The evaluation of the serious game intervention will be presented in detail in Chapter 6 and is focussed on pre- and post-test questionnaires (which were piloted and validated), a game experience questionnaire and focus groups. The process is summarised if Figure 1.3. This addressed Objective 5.

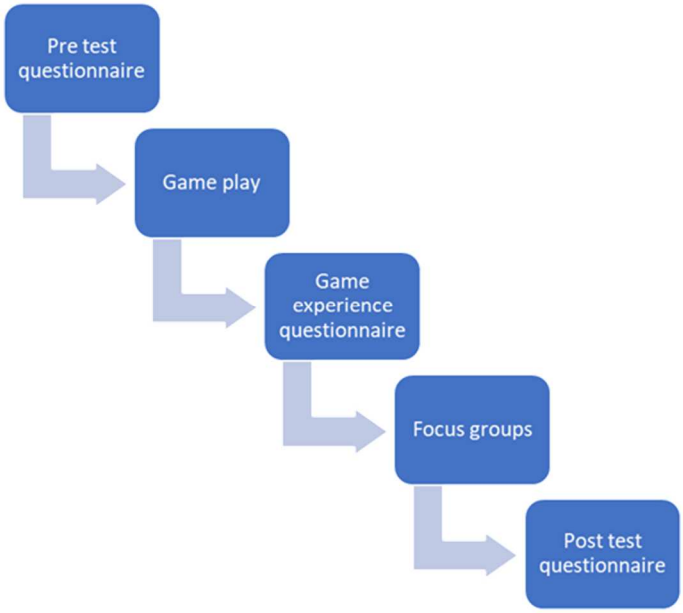


Figure 1.3 Summary of Evaluation Process

1.6 Thesis Structure

The overall thesis structure is shown in Figure 1.4.

1.6.1 Chapter 1 Introduction

This chapter introduces the topic of child protection in dentistry with particular emphasis on the problem of the 'gap' between suspecting and referring and why some dental team professionals do refer while others do not. The gap is a global problem and not limited to dental team professionals. In this chapter triadic game design methodology is also introduced as a suitable and sensible way of investigating the problem and designing an appropriate serious game intervention to support teaching and training of this subject.

1.6.2 Chapter 2 Literature Review

Chapter 2 investigates the literature regarding dental team professionals' involvement with child protection. The relevant guidance and legislation are introduced to frame the environment within which the dental team professionals work. The similarities and differences with other healthcare professionals are also discussed. The barriers to referral are investigated and summarised and methods used to tackle these barriers are explored. Literature surrounding the

child protection teaching and training of dental team professionals and other healthcare workers is discussed (Objective 1).

Potential pedagogic principles of tackling the perceived barriers are explored (Objective 3). The literature surrounding methods of investigating this complex area is investigated and the need for qualitative methods introduced. Triadic Game Design is discussed in detail and the case for a serious game intervention to support teaching/training in child protection/safeguarding is made.

1.6.3 Chapter 3 Methodology for In-Depth Interviews

Chapter 3 discusses the methodology for in-depth interviews with dental team professionals across Scotland. This chapter discusses why a qualitative methodology, and in-depth interviews particularly, are an appropriate choice for investigating the perceptions and experiences of dental team professionals. The study design for the in-depth interviews is discussed in detail. This chapter contributes to Objective 3 of this thesis.

1.6.4 Chapter 4 Analysis & Results of In-Depth Interviews

Chapter 4 presents the analysis of the findings of the in-depth interviews. It discusses the potential approaches that were considered for analysis and justifies why thematic analysis was chosen. The results of the thematic analysis are presented and discussed before the issues from the perspective of dental team professionals practicing in Scotland are summarised (Objectives 1 and 2).

1.6.5 Chapter 5 Design of Serious Game

Chapter 5 discusses which factors identified in the literature review and in the in-depth interviews could potentially be tackled by a serious game intervention. The decision which factors we choose to target is explained and the design process for the serious game intervention is laid out, focussing on triadic game design and Learning Mechanics-Game Mechanics (Arnab et al., 2015) (Objective 4). The prototypes are presented and discussed along with feedback and analysis from playtesting with dental students and serious game design students. The final game is presented together with a discussion of its potential merits.

1.6.6 Chapter 6 Evaluation of Serious Game

Chapter 6 presents the evaluation of the serious game intervention (Objective 5) which was designed in chapter 5. The process of developing the pre and post-test evaluation questionnaire is discussed along with the evaluation study design. The results from the evaluation study are presented in this chapter and discussed.

1.6.7 Chapter 7 Conclusion and Future Work

Chapter 7 summarises the results from this research project, identifying the new knowledge obtained and situating it within existing knowledge. Key findings are presented, and limitations acknowledged. Recommendations for future work that would be beneficial in this research area are suggested.

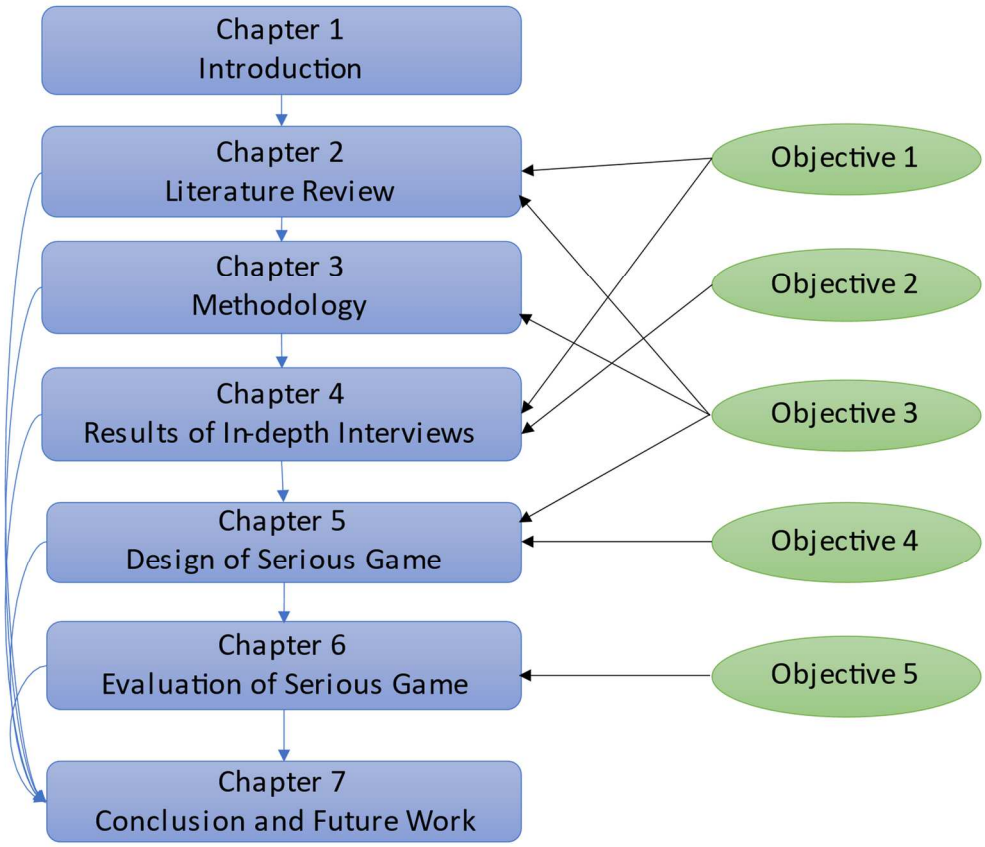


Figure 1.4 Diagram of Thesis Structure

Chapter 2 Literature Review

2.1 Introduction

The overall aim of this research was to investigate whether a serious game could provide an effective support for child protection/ safeguarding training for dental team professionals. This chapter will review current and existing literature to meet objective 1 (investigate thoroughly the factors related to referral of child protection concerns by dental team professionals in Scotland and prioritise them), objective 2 (investigate suitable pedagogic practices for approaching and intervening on these factors), and part of objective 4 (investigate and develop a serious game approach to support the delivery of teaching and training in child protection/ safeguarding to dental professionals based on the evidence gathered). Firstly, it is essential to understand what current research in the field has discovered about the topic and what methods have been used to research the factors related to referral of child protection concerns by dental team professionals. This evidence will be presented and discussed highlighting the important findings as well as the potential existing gaps in knowledge. The review of the literature also feeds into the development of the model of reality which follows Harteveld's (2010) Triadic Game Design approach.

This literature review has four main sections. The first section will present what is already known about the perceived problem of dental team professionals not always referring suspected cases, why this issue is important, how dental team professionals compare to other healthcare professionals regarding this issue, what barriers have already been identified for dental team professionals (in particular) and for healthcare professionals generally, and in what ways these have been addressed. The second section aims to discuss what is potentially missing from the currently available data and to discuss what methodology and methods would be appropriate to generate the required data. The third section will discuss the pedagogic practices for intervening when approaching the key factors identified in the first section (objective 3 of the overall research objectives). Finally, the fourth section will explore serious games and how they have been used in healthcare situations, their strengths and weaknesses for tackling complex problems and how they could support the delivery of teaching

and training in child protection / safeguarding to dental team professionals (objective 4).

2.2 Section 1 The Perceived Problem

The perceived problem is that dental team professionals do not always refer their concerns about potential child protection or safeguarding issues to the appropriate individuals. Dental team professionals are individuals who work within a dental team either in general dental practice, community dental service or the hospital dental service and can be a dentist, dental nurse, dental hygienist, dental therapist, dental receptionist, or practice manager. When presenting the currently available evidence the type of dental team professionals represented in the research will be highlighted. Child safeguarding is defined as the measures taken to minimise the risks of harm to children and includes protecting children from maltreatment, preventing impairment of children's mental and physical health or development, ensuring that children grow up in circumstances consistent with the provision of safe and effective care and taking action to enable all children to have the best outcomes (Department of Education, 2018). Child protection is defined by the Scottish Government in their National policy for Child Protection Guidance as protecting a child from child abuse or neglect (The Scottish Government, 2014). The definition of a child used in this research refers to persons under the age of eighteen although it is recognized that a child can be defined differently in different legal contexts (The Scottish Government, 2014). In this thesis the use of the term paediatric patients refers to children under eighteen years of age. Child abuse / neglect (CAN) refers to a person inflicting, or failing to act to prevent, significant harm to a child (The Scottish Government, 2014).

It is also important to understand what is meant by 'referral' of suspicions of CAN. In this research 'referral' is the passing on or sharing of information about a child to statutory agencies such as social services (usually the Children and Families department), the Police or the Scottish Children's Reporter (in cases where the child needs protection, guidance, treatment or control and it might be necessary for a Compulsory Supervision Order to be made in relation to the child). The National Guidance for Child Protection in Scotland state that:

> "Dental care practitioners will often come into contact with vulnerable children and are in a position to identify possible child abuse or neglect from examinations of injuries or oral hygiene. The dental team should have the knowledge and skills to identify concerns about a child's wellbeing and should know how, and with whom, to share that information." (The Scottish Government, 2014)

A summary of the process of how dental team professionals in Scotland would refer concerns about suspicions of CAN is shown in Figure 2.1.

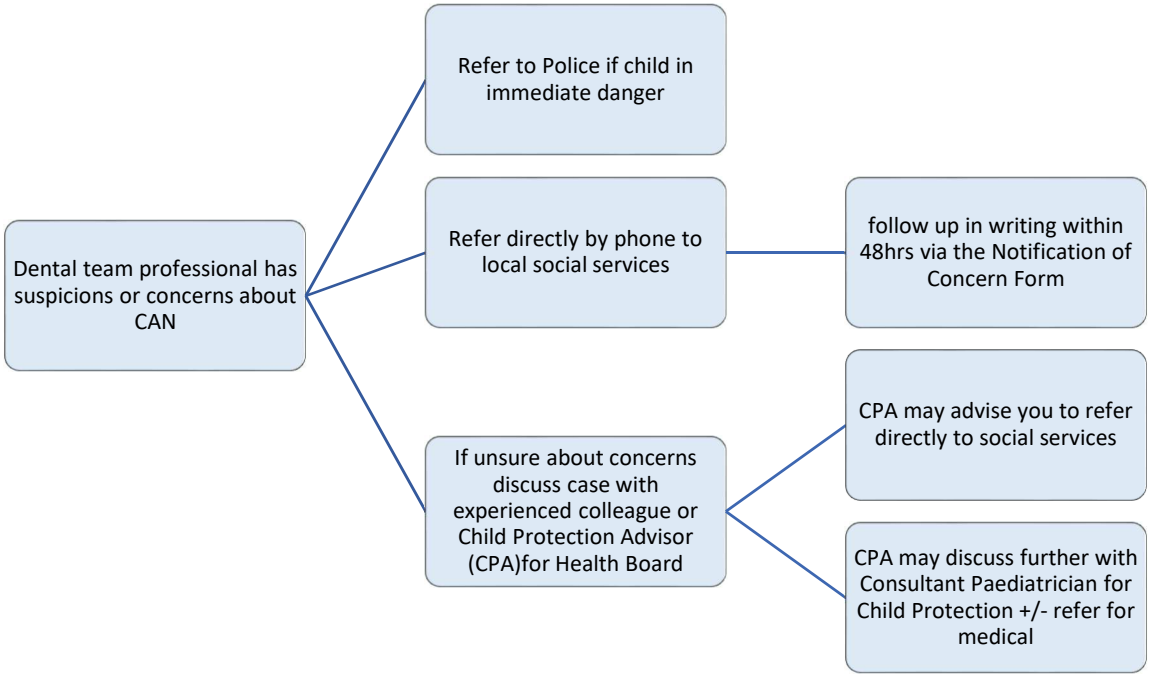


Figure 2.1 Flowchart of how dental team professionals refer concerns about CAN in Scotland.

The problem of dental team professionals not always referring their concerns about potential child protection or safeguarding issues is often called the gap; the difference between the those who have had suspicions and those who refer or share their suspicions. In the literature this gap is reported as percentages or proportions and, where appropriate, actual numbers of dental team professionals reported in the literature will also be discussed. The intervention discussed in this thesis is more targeted at what this gap means for the individual. In other words, we hope the serious game intervention will support the dental team professional who had suspicions but did not refer to become one who refers.

The involvement of the dental profession with child protection and safeguarding began to be reported in the scientific literature in the 1960s and 1970s, not long after the landmark paper "The battered child syndrome" by C. Henry Kempe in 1962. This paper described "the battered child syndrome" as a clinical condition which should be considered as a diagnosis in any child with "evidence of fracture of any bone, subdural haematoma, failure to thrive, soft tissue swellings or skin bruising, in any child who dies suddenly, or where the degree and type of injury is at variance with the history given" (Kempe, 1962). In the 50 years since Kempe's paper much has been published about the involvement of the dental profession in identifying and reporting cases of child abuse and neglect but there remains a gap between the proportions of dental team professionals who have suspected abuse or neglect and those who have referred suspected cases onto appropriate authorities. This gap has been demonstrated in Scotland, other parts of the UK and Internationally within thirty papers which represent the responses of 12184 dental team professionals. These papers are summarised in Table 2.1 for papers originating in the UK, Table 2.2 for papers from the rest of Europe and Table 2.3 for papers from the rest of the world. The tables include details of the numbers of dental team professionals that have been surveyed, the proportions reported as suspecting CAN and those who either said they referred or, alternatively said they suspected but did not refer.

Table 2.1 Table of UK Papers Illustrating Gap Between Suspect and Refer

Author /date	**(Cairns et al., 2005)**	**(Harris et al., 2013)**	**(Harris et al., 2009)**	**(Al-Habsi et al., 2009)**	**(Chadwick et al., 2009)**	**(Clarke et al., 2019)**	**(Lazenbatt and Freeman, 2006)**
Geographical area	Scotland	Scotland	UK	London, UK	UK	Manchester, UK	Northern Ireland
Type of survey	Postal	Postal	Postal	Postal	Postal	Electronic	Postal
Sample size	375	628	490	105	396	36	419
% Dental team professionals suspecting CAN	29	37	67	16	34	58	60
% Reporting/ referring	8	11		7		26	47
% Suspect not refer			37		18		

In the UK a total of 2449 responses from dental team professionals have been reported, in the rest of Europe some 5120 responses and in the rest of the world some 4615 responses. Surveys were either postal questionnaires (15 papers), electronic questionnaires (8 papers email or web-based), telephone

questionnaires (2 papers), in-person questionnaires (2 papers) or hard copy questionnaires given out and collected at an event (3 papers) or hand delivered and collected from participants place of work (1 paper). Response rates varied with postal response rates from 13% (Ramos-Gomez et al., 1998) to 76.3% (Uldum et al., 2010), electronic response rates of 1.6% (Al-Dabaan et al., 2014) to 95% (Kvist et al., 2012), telephone questionnaire response rates of 64% (Kilpatrick et al., 1999) and 88% (John et al., 1999), in person interviews response rates of 88 and 83% (John et al., 1999, Laud et al., 2013), those given out and collected at events response rates of 64% (Sonbol et al., 2012) to 93.75% (Cukovic-Bagic et al., 2015) and the one hand delivered and collected from the participants place of work response rate of 68% (Azevedo et al., 2012). Two of the papers had particularly low response rates of 1.6% (Al-Dabaan et al., 2014) and 5% (Kural et al., 2020). Both were electronic questionnaires, and they could not comment on how well their sample reflected their study populations. These studies are therefore at high risk of non-responder bias and their results need to be interpreted with this in mind.

Table 2.2 Table of European Papers Illustrating gap between suspect and refer.

Author /date	Geographical area	Type of survey	Sample size	% Dental team professionals suspecting CAN	% Reporting/ Referring	% Suspect not refer
(Crowley et al., 2019)	Ireland	Electronic	67	30.8	8.1	
(Laud et al., 2013)	Greece	In person	368	13 abuse 35 neglect	1.6	
(Cukovic-Bagic et al., 2015)	Croatia	Given out at event	510	26.2	5.1	
(Brattabø et al., 2016)	Norway	Electronic	1200		60	32.6
(Rønneberg et al., 2019)	Oslo, Norway	Electronic	87		71	33
(Kvist et al., 2012)	Sweden	Electronic	460	100	28	
(Uldum et al., 2010)	Denmark	Postal	1145	38.3	11	
(Jakobsen et al., 2019)	Faroe Islands	Postal	51	61	39	
(Kural et al., 2020)	Turkey	Electronic	1020	17.1	1	
(Özgür et al., 2020)	Turkey	Electronic	212	43.9	12.7	

Table 2.3 Table of Rest of World Papers Illustrating gap between suspect and refer.

Author /date	Geographical area	Type of survey	Sample size	% Dental team professionals suspecting CAN	% Reporting/ Referring
(Al-Amad et al., 2016)	UAE	Postal	193	25	7
(Al-Dabaan et al., 2014)	Saudi Arabia	Electronic	122	59	10
(Owais et al., 2009)	Jordan	Postal	340	42	20
(Sonbol et al., 2012)	Jordan	Given out at event	256	50	12
(Hussein et al., 2016)	Malaysia	Given out at event	108	66.6	14.8
(El Sarraf et al., 2012)	Southern Brazil	Postal	69	36	12
(Azevedo et al., 2012)	Southern Brazil	Hand delivered and collected	175	14.3	3
(Tilvawala et al., 2014)	New Zealand	Postal	320	46 Abuse 39.9 Neglect 57.2 Dental Neglect	28.6 Abuse 21.5 Neglect 31.8 Dental Neglect
(Bankole et al., 2008)	Nigeria	Postal?	175	39.4	6.9
(Ramos-Gomez et al., 1998)	California, USA	Postal	2005	16	6
(Bsoul et al., 2003)	Texas	Postal	383	50	25
(John et al., 1999)	Victoria, Australia	In person/ Telephone	347	28	8
(Kilpatrick et al., 1999)	NSW, Australia	Telephone	122	24 GDP 58 Paed	10 GDP 36 Paed

The proportion of dental team professionals suspecting CAN as well as the "size" of the gap varies between geographical areas and is also affected by the type of dental team professional that has been surveyed, for example in the UK Cairns et al. (2005), Harris et al. (2013),Al-Habsi et al. (2009) and Clarke et al. (2019) all conducted their research with general dental practitioners whereas Harris et al. (2009) reported the results of questionnaires from dental team professionals with an interest in paediatric dentistry, Chadwick et al. (2009) reported results from a survey of dental therapists and Lazenbatt and Freeman (2006) reported results from a mixture of primary healthcare professionals including dentists, doctors and community nurses. The literature acknowledges that dental team professionals with an interest in paediatric dentistry would be more likely to suspect and to refer cases of CAN due to their experience of treating more children. This seems to be the case in some papers (Harris et al., 2009, Kilpatrick et al., 1999, Hussein et al., 2016) but other papers reporting the results of dental team professionals without an identified interest in paediatric

dentistry report similar suspicion and referral rates (Sonbol et al., 2012, Tilvawala et al., 2014). The Kvist et al. (2012) paper is slightly different as it reports the responses of clinical department heads in the public dental service in Sweden who may oversee more than one clinical department, and this may be the reason all their respondents reported suspicions of CAN.

The two papers in Scotland that looked at the role of the general dental practitioner in child abuse, Cairns et al (2005) and my own previous research (Harris et al. 2013), were based on questionnaires sent to a random sample of Scottish general dental practitioners and attempted to quantify the proportion of dentists who had suspected abuse or neglect and those who had referred. Both papers demonstrated that the gap between those who suspected and those who referred was apparent, although in the 2013 paper there was a larger proportion of dentists for both suspected (37%) and who referred (11%) than in the 2005 paper (29% and 8% respectively). This perhaps reflected an increasing awareness of the problem. It is also important to note that the General Dental Council (GDC) did not make child protection training a mandatory part of undergraduate education for dental students until 2006. It was the Cairns et al. (2005) paper that precipitated the GDC ruling. The ability of newly qualified professionals to identify and manage CAN is currently listed in the GDC "Preparing for Practice"(General Dental Council, 2015) document as learning outcome 1.8.8 for dentists:

> "Identify the signs of abuse or neglect, explain local and national systems that safeguard welfare and understand how to raise concerns and act accordingly."

Learning outcome 1.8.7 for dental therapists and dental hygienists:

> "Recognise the signs of abuse or neglect, describe local and national systems that safeguard welfare and understand how to raise concerns and act accordingly."

Learning outcome 1.8.6 for dental nurses, orthodontic therapists and 1.8.7 for clinical dental technicians which are worded as follows:

> "Recognise the signs of abuse or neglect and describe local and national systems and raise concerns where appropriate."

There are slight subtle differences in the wording of all these learning outcomes but for all these named dental team professionals it is mandatory that they can recognise CAN and raise their concerns.

2.2.1 Why it is important to tackle the gap

2.2.1.1 The prevalence of abuse and neglect in Scotland, the U.K, and Internationally

In the United Kingdom it was reported that in 2014 there were 50000 children who were identified as needing protection from child abuse or neglect (CAN) and it is estimated that 1 in 10 children in the UK experience neglect (NSPCC). Statistics about the numbers are difficult to interpret as official statistics only highlight those who have already been identified as needing protection or support. The NSPCC estimate that for every child identified as needing protection from abuse there are another 8 who are suffering. Children who are abused or neglected cannot always ask for help themselves. They may be too young, scared, or ashamed to report what is happening to them and many may not realise that what they are experiencing is abnormal.

In Scotland there were 2599 child on the child protection register in 2019. This number fluctuates although it has been broadly stable over the past decade. The trend was generally upwards until 2014 but has reduced slightly in Scotland in every year since, apart from 2018 (https://www.gov.scot/publications/childrens-social-work-statistics-scotland-2018-2019/pages/4/). At present about half of the children on the child protection register in Scotland are under 5 years old. At child protection case conferences in Scotland multiple concerns can be recorded rather than just one main concern. On average 2.8 concerns are registered for every case. The top concerns in Scotland are domestic violence, parental substance misuse and neglect. Worldwide 1 in 4 children under age 5 live with a mother who is a victim of intimate partner violence and in Scotland it is estimated that 100,000 children live with domestic abuse (https://www.improvementservice.org.uk/__data/assets/pdf_file/0017/8342/em-briefing-children-domestic-abuse.pdf)

It is widely known that child maltreatment is a global issue (World Health Organisation, 2014) but there are still many countries where data is lacking regarding how widespread it is as it is a complex issue which is difficult to study. The difficulties in researching the issue are due to different definitions of CAN or child maltreatment that are used and the coverage and quality of both official statistics and from research involving self-reports from victims or their families. Statistics from the United Nations Children's Fund (UNICEF) show that worldwide nearly 300 million (3 in 4) children aged 2 to 4 experience violent discipline by their caregivers on a regular basis and about 6 in 10 children are physically punished (United Nations Children's Fund, 2017). The World Health Organisation reports that there are an estimated 40150 homicide deaths in children globally every year and the United Nations Office on Drugs and Crime report that there were 205,153 homicide deaths in children aged 0 to 14 years worldwide during the ten-year period 2008–2017(UNODC, 2019). Some of these homicides are likely due to CAN and it is almost certain that this underestimates the problem, since some deaths due to CAN will be incorrectly attributed to falls, burns, drowning and other causes.

2.2.1.2 The effects of abuse and neglect on children and young people, communities and professionals

The social and cognitive development of children as well as their physical and emotional health is damaged in the short and long term by CAN. Children experiencing CAN need to be identified as early as possible and provided with appropriate support to ensure that problems don't escalate and to give the affected children the best chance to thrive (Hildyard and Wolfe, 2002). A systematic review and meta-analysis from 2012 suggested a causal relationship between non-sexual child maltreatment and a range of mental disorders, drug use, suicide attempts, sexually transmitted infections, and risky sexual behaviour (Norman et al., 2012). It was also shown that people who have experienced four or more categories of childhood adverse events (defined as experiencing psychological, physical, or sexual abuse; violence against mother; or living with household members who were substance abusers, mentally ill or suicidal, or ever imprisoned), compared to those who had experienced none, have risks for alcoholism, drug abuse, depression, suicide attempt, smoking, poor self-rated health, sexually transmitted disease, physical inactivity and

severe obesity (Felitti et al., 1998). They also demonstrated that the number of categories of adverse childhood exposures showed a graded relationship to the presence of adult diseases including ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease (Felitti et al., 1998). There is evidence that CAN affects brain development in a variety of ways (Shonkoff et al., 2012). It has also been shown that CAN may result in long term deficits in educational achievement and higher proportions of victims in menial and semi-skilled occupations than control cases with fewer remaining in employment (Gilbert et al., 2009). It is clear to see that CAN not only impacts on the individual themselves but on their wider communities. It has been shown that decision making by services involved in protecting children is often not aligned with the children's timescales and it is extremely important that assessment of and decisions about children respond more closely to their needs (Brown and Ward, 2013).

Some researchers have also investigated how being involved in CAN cases affects the professionals attached to the cases. Studies have shown that the professionals' sense of safety can be adversely affected (Pistorius et al., 2008, Menashe et al., 2014). Another paper has shown that the parenting styles of those involved in CAN cases demonstrates more warmth and reasoning than their peers (Dursun et al., 2014). There does not appear to be any literature surrounding the effects on dental team professionals who are involved in cases of CAN.

2.2.2 Barriers to referral in dental team professionals

The first paper that seems to discuss barriers to reporting for dental team professionals appeared in The USA in 1979 (Malecz, 1979) and the author found that uncertainty about the diagnosis (41%), fear of involvement in litigation (26%) , lack of familiarity with the signs and symptoms (19%), and possible effects on the dentist's practice (6%). The next papers to discuss barriers to reporting for dental team professionals appeared in the late 1990s (Ramos-Gomez et al., 1998, John et al., 1999, Kilpatrick et al., 1999). Ramos-Gomez et al. (1998) were based in the USA and surveyed dentists in California using a 33-question survey with each question either being multiple choice or true or false format. They sent the questionnaire by post to the 15000 dental health care

practitioners registered with the California Dental Association. Their response rate of 13% (2005 responses) is relatively low for a questionnaire. When it came to researching what the barriers to referral were, the respondents were given a choice of nine options from which to make their selection of which one selection best described their reasons for not reporting. In the discussion they reported that barriers were doubt about the correctness of suspicions, hesitancy to file a report that may not be borne out by the evidence, reluctance to consider the possibility that injuries were intentionally inflicted, aversion to disrupting the relationship with the patient, fear of potential effects on one's practice and apprehension about legal entanglements. These barriers have all been given previously as reasons for not reporting cases of suspected abuse or neglect by the American Dental Association Council on Dental Practice(American Dental Association Council on Dental Practice, 1995).

John et al. (1999) and Kilpatrick et al. (1999) published studies in different areas of Australia in the same year. John et al developed their own 16 question survey instrument comprising open-ended and multiple-choice questions. For the part of their research concerning barriers their participants were asked over the phone to reply yes or no when "In reporting child abuse I would consider..." and then given six options of patient confidentiality, possible effects on my practice, uncertainty about diagnosis, fear of litigation, possible effects on child's family and possible effects on child. Kilpatrick et al. (1999) also designed their own telephone questionnaire. Details are not given as to the exact wording of the questions to the participants, but they report their results as reasons "for hesitating to report any suspicions" and give 6 options namely, concerns about confidentiality, unsure about the diagnosis, unsure about the consequences of reporting, not the dentist's responsibility, possible effect on the practice and fear of litigation.

In the United Kingdom the first paper to investigate barriers was Welbury et al's seminal paper in 2003 (Welbury et al., 2003). Prior to this paper it was not known whether general dental practitioners (GDPs) in the UK accepted they had a role in child protection or if they felt they had needs in developing their role further. The paper used qualitative methods to explore the topic. Initially one to one in depth interviews between the focus group leader (who was recruited by the research team because of her experience in qualitative analysis) with seven

key informants (2 general dental practitioners, 2 people from social services 1 member of the local dental committee, 1 paediatric dentist and 1 person from community child health were conducted. The corresponding author states that the key informants were chosen to give a “broad brush” of the potential issues from different dental aspects. The data from these interviews was used to “identify issues” and inform the development of a discussion guide for focus groups. There were 5 focus groups for the main research all of whom were in the North East of England and the participants volunteered and were recruited based on the location of their practices, the length of time they had been qualified and their previous attendance at post graduate child protection training events as the researchers “expected that undergraduate input in child protection would be negligible for those less recently trained” (as mentioned previously child protection training for dental undergraduate students was not made mandatory until 2006). The focus groups had between 3 and 6 participants and thought was put into the makeup of the groups as two of the groups only had participants with less than 15 years’ experience and 2 had only participants with more than 15 years’ experience with one mixed group. The makeup of focus groups can be very important as group dynamics may inhibit or distort responses given (Ritchie, 2013) especially if there is a difference in status between participants in the same group. Following the focus group interviews the recordings were transcribed and thematically analysed and interesting and important information was revealed which has subsequently been used by other authors in their quantitative questionnaire research. Welbury and colleagues discuss and present their findings under three main headings: GDP relevant background factor; perceptions and behaviour in child protection issues; and inhibiting and motivating factors in child protection. All three of these headings fit with the idea of attempting to model practices with regards to child protection issues for the participants, this is what Harteveld refers to as the world of reality (Harteveld, 2010). In this paper the question being investigated was whether GDPs accepted they had a role in child protection and whether they felt they had educational needs in developing this role further, both of which require information on attitudes (and hence the focus groups were an appropriate methodology).

The GDP relevant background issues included isolationism, lack of holistic approach to patient care and attitudes to further training and professional development. The theme of isolationism meant that GDPs lacked experience and confidence in acting in a multi-professional context. This is interesting as it brings in questions of how GDPs would gain this experience and what experiences would be required to make them feel more confident. It also raises the question as to what confidence means in a multi-professional context and whether it varies from person to person. This lack of confidence regarding the role of the dental team in the overall referral process requires further investigation (potentially by way of in-depth interviews) to understand how important this is. The theme of lack of a holistic approach to patient care concluded that GDPs focus on specific clinical signs and symptoms but are less confident in a holistic approach to child health. Additionally, most of the GDPs felt they knew the children and their families who attended their practices well, but that this was limited by short or busy appointments as well as some parental attitudes to follow up care for their children. This highlights a focus on the parents rather than the child's needs but also suggests that if a practitioner knows a family well, they will be aware of parental attitudes to their children's dental care and felt they could comment on this. Some participants also felt they had relatively infrequent contact with their child patients, and so questioned the appropriateness of their role in child protection. The GDPs also felt that their relationships with parents and children were affected by the current ease of transfer of patients between dental practices with no transfer of clinical notes. This means that when the GDP meets a patient for the first time they begin from scratch. It is not yet known why the "new" dentist does not decide to contact the "old" dentist to ask for information, or if, in fact it is perceived that they cannot ask for this information. This may have some parallels to the reluctance or hesitation to share information in a multi-disciplinary context. It was also noted that some GDPs can become de-sensitised in areas of relatively low parenting skills and so judge situations based on what is normal for that geographical area rather than what might be considered normal in wider society. This is worrying as it suggests a higher threshold of suspicion may be present in areas of low parenting skills. It may be that GDPs are aware of their de-sensitisation and this is an important area that will be included in the research undertaken in this thesis to understand how this affects

the GDPs practice and referral behaviours. The last of the GDP relevant background issues discussed was their attitudes to further training and professional development. They reported that this is affected by time and financial pressures as well as there being no regulated CPD requirements at that time. The external requirements issue is interesting to pick up as a factor and the inclusion of this by the GDPs in their discussion suggests that the external professional environment that they worked in did affect the choices they made when it came to further training and professional development. In April 2015 safeguarding of children did become a recommended continued professional development (CPD) topic from the General Dental Council for dental professionals and they currently recommend that dental team professionals keep their skills up to date in the topic of safeguarding children and young people(General Dental Council).

Perceptions and behaviour in child protection issues in Welbury et al (2003) also covered perception of child protection which in this study, appeared to be largely formed from media reports of worst-case scenarios and led to a hesitancy of the GDPs to get involved. Behaviours were explored in GDPs who had had concerns and acted on them and those who had had worries but not acted. This is a demonstration of the gap between those who had suspected and those who had acted. If participants had not had any previous experience of child protection concerns, the authors anticipated that participants would have a variety of potential outcomes of any such interaction: avoiding it; discussing it with colleagues in their practice; getting a second opinion from colleagues; discussing it with a specialist in paediatric dentistry or consulting the child's general medical practitioner. In the focus groups it was clear that the least likely route the GDPs would take was to refer to social services. Additionally, when it came to behaviours in clinical note-keeping, the main details recorded by GDPs were in relation to oro-facial issues and nothing on any wider concerns.

The theme of inhibiting and motivating factors in child protection in Welbury et al. (2003) identified that all the participants in the focus groups acknowledged they had an ethical responsibility as professionals and members of society to protect children. However, there were various inhibiting factors identified during the focus groups including: difficulty identifying abuse; concern about the outcome (making things worse, getting it wrong); consequences for themselves

and their practice; anticipated antagonism from parents; and a perceived need for certainty before action. The uncertainty related not only to difficulties and complexities in identification but also to poor knowledge of referral routes and procedures. It was noted that coping with uncertainty contrasts with the GDPs routine clinical practice where they are accustomed to feeling confident in identifying clinical signs and symptoms. The paper suggested some facilitators including: frequent communication with practice staff both formally and informally; establishing links and contacts with other dentists general medical practitioners and other professionals; development of interaction skills with children and families; informal professional advice; local support; feedback systems involving dentists; raising awareness of the issue; undergraduate and postgraduate training; wider promotion of courses and circulation of guidelines. It is likely that any intervention to address the problem of the suspicion / referral gap will target one of these inhibiting factors, but the approach to the design of such an intervention will vary greatly depending on what is identified as the primary or most important inhibitory factor.

Since the papers of Ramos-Gomez et al. (1998), John et al. (1999),Kilpatrick et al. (1999) and Welbury et al. (2003) there have been seven UK papers, ten wider European papers and ten other international papers which have reported on barriers to reporting for dental team professionals. These are summarised in Table 2.4, Table 2.5 and Table 2.6.

One of the seven UK papers (Lazenbatt and Freemen., 2006) did not report on the proportions of dental professionals who highlighted the barriers to reporting as in their paper they used two open ended questions “Why are suspected cases of CPA not reported?” and “What are the barriers to reporting abuse?” to identify barriers. In Table 2.4 this paper has been included with an “x” to demonstrate which barriers were identified in their content analysis of these open-ended questions. In their paper they group their results regarding barriers under three themes, namely “fear of misidentification and its consequences”, “uncertainty when reporting” and “challenges to reporting” (Lazenbatt and Freemen., 2006) and the results shown in table 2.4 for this paper have been extrapolated from their results section.

Table 2.4 UK papers barriers to referral of suspected cases of CAN
Top Barrier for each paper is highlighted in red.

	(Al-Habsi et al., 2009)	(Cairns et al., 2005)	(Chadwick et al., 2009)	(Clarke et al., 2019)	(Lazenbatt and Freeman, 2006)	(Harris et al., 2013)	(Harris et al., 2009)
Geographical area	London, UK	Scotland	UK	Manchester, UK	Northern Ireland	Scotland	UK
Fear of wrong diagnosis/ getting it wrong				47	x		
Lack of certainty/confidence of diagnosis/adequate history	86	88	70	50	x	74	78
Insufficient knowledge of how to report	68	71	39	1	x	43	32
Don't know how to take history of a suspicious injury/unsure how to document findings							
Lack of knowledge of signs/ symptoms of child abuse and neglect					x		
Fear of parental response or complaint				8	x		
Fear of violence (not specified to whom)							
Fear of Consequences to child	56						
Fear of Negative effects on child's family					X		
Fear of Family violence to child	66	34	61	78	x	52	53
Fear of Family violence to dentist or threats		31	28	31	x	31	32
Fear of Concerns about losing patient/ family							
Fear of trouble with authorities							
Concerns about confidentiality							35
Fear of litigation	28	48	31			35	29
Fear of consequences to child from statutory agencies/ uncertainty of consequences		52	52	17	x	46	52
Fear of being identified as the reporter/ unpleasant as not anoan				35.8	x		
Lack of confidence in child protection service					x		
Lack of time					x		
Negative impact on practice	10	11	2	19	x	6	4
Not wanting to get involved				19			
Lack of knowledge of consequence of abuse							

For the UK, the top barrier to referral appears to be lack of certainty of the diagnosis although in the most recent UK paper the top barrier was fear of family violence to the child (Clarke et al., 2019). Out of the UK papers two are from Scotland looking at the role of general dental practitioners in child abuse (Cairns et al., 2005, Harris et al., 2013). A larger proportion of dentists had had undergraduate and postgraduate training in the later paper. However, despite this increase in training uptake, efforts so far have not tackled the gap which is the core problem at the heart of this thesis. The suggested factors in these papers which influenced the decision to refer were: concerns of impact on the practice (11% in 2005,6% in 2013), fear of violence to the child (34% 2005, 52% 2013), fear of violence to the GDP (31% in 2005 and 2013), fear of litigation (48% in 2005, 35% in 2013), fear of consequences to the child from statutory agencies (52% in 2005, 46% in 2013), lack of knowledge of referral procedures (71% in 2005, 43% in 2013) and lack of certainty of the diagnosis (88% in 2005, 74% in 2013). In summary the two main issues appear to be fear (of potential outcomes) and confidence (in how to refer and lack of confidence in diagnosis). Importantly these options were given for the respondents to tick, and no results of any free text was reported. Although these potential barriers to referral had been previously identified and targeted in training courses in the intervening time between the papers, the gap between suspicion and referral did not really seem to change. This suggests that the full complexity of the problem has not yet been identified and how it relates to the dental team.

When looking at papers in the rest of Europe six out of the ten papers had uncertainty of the diagnosis as the top barrier. The other top barriers were fear of family violence to the child (Cukovic-Bagic et al., 2015) or of the wrong diagnosis(Jakobsen et al., 2019) and insufficient knowledge of either how to refer (Özgür et al., 2020) or of the signs and symptoms of CAN (Drigeard et al., 2012).

Table 2.5 Rest of Europe barriers to referral of suspected CAN
Top Barrier for each paper is highlighted in red.

	(Crowley et al., 2019)	(Bjorknes et al., 2019)	(Rønneberg et al., 2019)	(Uldum et al., 2010)	(Jakobsen et al., 2019)	(Laud et al., 2013)	(Cukovic-Bagic et al., 2015)	(Kural et al., 2020)	(Özgür et al., 2020)	(Drigeard et al., 2012)
Geographical Area	Ireland	Norway	Norway	Denmark	Faroe Islands	Greece	Croatia	Turkey	Turkey	France
Fear of wrong diagnosis/ getting it wrong					90					
Lack of certainty/confidence of diagnosis/adequate history	49.3	90.4	67	80		44	44	45	21.5	
Insufficient knowledge of how to report	23.9	48.9		61	27.4		33	18.3	38.5	
Don't know how to take history of a suspicious injury/unsure how to document findings		64.2								
Lack of knowledge of signs/ symptoms of child abuse and neglect		68	15							59.8
Fear of parental response or complaint		53							26.2	
Fear of violence (not specified to whom)										
Fear of Consequences to child		41.6			31.4	20		18.8		
Fear of Negative effects on child's family		45.1								
Fear of Family violence to child	35.3			63			46		29.2	34
Fear of Family violence to dentist or threats	25.4	26.4	6	8		3	11			31
Fear of Concerns about losing patient/ family		38.4	14							
Fear of trouble with authorities										
Concerns about confidentiality	8									
Fear of litigation				12			12			
Fear of consequences to child from statutory agencies/ uncertainty of consequences	32.8		4	57			36			53.3
Fear of being identified as the reporter/ unpleasant as not anoan		60								
Lack of confidence in child protection service	20.9									
Lack of time			6							28
Negative impact on practice				5	10	3	6			10.5
Not wanting to get involved										
Lack of knowledge of consequence of abuse										

Table 2.6 International papers barriers to referral of suspected CAN
Top Barrier for each paper is highlighted in red.

	(Al-Amad et al., 2016)	(Al-Dabaan et al., 2014)	(Mogaddam et al., 2016)	(Owais et al., 2009)	(Sonbol et al., 2012)	(Bsoul et al., 2003)	(Ramos-Gomez et al., 1998)	(John et al., 1999)	(Kilpatrick et al., 1999)	(Tilvawala et al., 2014)	(Hussein et al., 2016)	(Kaur et al., 2016)	(Bankole et al., 2008)
Geographical area	**UAE**	**Saudi Arabia**	Saudi Arabia	Jordan	**Jordan**	**Texas, USA**	**California, USA**	**Victoria, Australia**	**NSW, Australia**	New Zealand	**Malaysia**	**India**	**Nigeria**
Fear of wrong diagnosis/ getting it wrong	32									68.6			
Lack of certainty/confidence of diagnosis/adequate history		80	21 (Dx) 14 (Hx)	76 (Hx) 73 (Dx)	41 (Dx) 20 (Hx)	58	14	86	24		37	42.1	81.1
Insufficient knowledge of how to report or role	21	79	60		41		6				28.7	43.9	
Don't know how to take history of a suspicious injury/unsure how to document findings										45	43.5		
Lack of knowledge of signs/ symptoms of child abuse and neglect						28				40			
Fear of parental response or complaint	16		27		43					35			
Fear of violence (not specified to whom)	13												
Fear of Consequences to child		79		66								81	92
Fear of Negative effects on child's family		59		52	19		3					48	
Fear of Family violence to child		88	21							38			
Fear of Family violence to dentist or threats		48		49									
Fear of Concerns about losing patient/ family	2									5			
Fear of trouble with authorities	1												
Concerns about confidentiality				50				26	75				
Fear of litigation		26		28	10			18	28				64.4
Fear of consequences to child from statutory agencies/ uncertainty of consequences				48									
Fear of being identified as the reporter/ unpleasant as not anoan													
Lack of confidence in child protection service							1			30			
Lack of time				41			1			5			
Negative impact on practice		23		31	12	6	3	14				28	
Not wanting to get involved													
Lack of knowledge of consequence of abuse											19		

For the rest of the international papers the top barrier is uncertainty of the diagnosis for 4 papers, while 5 papers have different types of fear as the top barrier; namely fear of wrong diagnosis, fear of family violence to the child and fear of consequences to the child. Two papers have insufficient knowledge of either how to refer or take a history of abuse and for one paper the top barrier was concerns regarding confidentiality.

Kvist and colleagues attempted to examine what factors cause specialists in paediatric dentistry to suspect child abuse or neglect and aimed to determine what influenced their decisions to report (Kvist et al. 2014). They again used focus groups with group sizes ranging from 2 to 6 people in a total of 4 focus groups. The main theme they elicited was “the dilemma of reporting child maltreatment” with three sub themes of “to support or report”, “differentiating concern for well-being from maltreatment” and the “supporting or unhelpful consultation” with colleagues or other health professionals. The consultation with colleagues was regarding a need for reassurance that the concern the specialist had was adequate for a referral. This shows parallels with the general dental practitioners’ need for certainty of the diagnoses and suggests that the decision to report is not always easy, even for those who are widely regarded as experts in paediatric dentistry.

Some authors have taken a different approach to investigating what affects the decisions of dental team professionals to refer or not. Brattabø et al. (2016) found that referral, or reporting as they term it, is influenced by the dental team professionals age, working experience, number of patients treated, size of the municipality in which they work and the geographical area. In later work Brattabø et al. (2019) took a “reasoned action approach” to predicting the intention of dental team professionals to report suspected child maltreatment. This was a socio-cognitive model of attitude-behaviour relations called the theory of planned behaviour. They found that the dental professionals “instrumental attitudes and perceived behaviour control” were the strongest predictors of a dental team professional’s intention to report. They suggested that to strengthen the reporting intention of the dental team professionals it was necessary in training or education to focus on the value and positive consequences of reporting, the resources available and how to overcome obstacles. They also suggested that paying attention to the “normative

expectations" and feelings that the dental team professionals have about reporting may also be helpful.

2.2.3 Is this an issue that is unique to dental team professionals?

It has been demonstrated that children could be better protected by the services they are involved with by improving the identification and initial response to CAN, improving the effectiveness of interventions after CAN is identified and better more effective inter-agency and inter-disciplinary working (Davies and Ward, 2012). However it has also been noted that identifying CAN and understanding when to take action is a difficult area for all practitioners who work with children (Daniel et al., 2011). It is therefore perhaps unsurprising that the perceived problem of dental team professionals not always referring suspected case of CAN is not unique among health professionals. The NSPCC has the largest repository of serious case reviews in the UK (https://learning.nspcc.org.uk/case-reviews/national-case-review-repository) and produce briefings for various sectors based on comprehensive reviews of the cases in the repository. From these reviews it is noted that in healthcare there are some key issues which include health professionals not seeing the bigger picture and having a family focus (NSPCC, 2015b). They note when health professionals work with large numbers of families with complex needs there is a risk of de-sensitisation to issues such as drug and alcohol abuse. Particularly for general medical practitioners (GMP) it is difficult for them to see the bigger picture because they work in a system which focuses on measurable disease outcomes rather than holistic health and wellbeing outcomes, they work with complex family structures (different surnames, addresses and adults who change partners) and are moving towards larger practices with both full and part-time staff and a range of services (NSPCC, 2015a). This means individual patients are seeing a larger number of healthcare professionals and so there is less continuity of care. In studies concerned with the identification and reporting of suspected cases of CAN by paediatricians, over 60% of respondents' report that they have seen suspected or confirmed cases of CAN (Vulliamy and Sullivan, 2000, Shor, 1998, Kraus and Jandl-Jager, 2011). Details of numbers who did not report their suspicions are harder to find and it is stated that admitting not referring suspected cases has high legal and moral implications for the paediatricians studied. In one Austrian study 43% of the physicians surveyed said they had seen

cases where they had had suspicions but had not reported the case (Van Haeringen et al., 1998). The paediatricians do differ in their perceived barriers to reporting. Vulliamy and Sullivan (2000) found the reasons for reluctance to report were negative views of social workers, loyalty to parents, negative views of the court system, diagnostic confusion, issues around confidentiality, ignorance of laws, physicians being unwilling to get involved and feeling that the family would not seek help if the doctor referred. Conversely an increased degree of comfort in referring was found to be associated with perceived social worker professionalism, ease of giving the report and being treated in a professional manner.

There has been a Child Abuse Reporting Experience Study amongst primary care clinicians in the USA (Flaherty et al., 2008, Jones et al., 2008) which looked at their decision-making processes concerning whether injured children were victims of physical child abuse. Some 4.6% of the clinicians indicated they had not referred all suspected abuse in their career but when the injuries they had seen were assessed for suspicion of abuse only 6% of all the suspicious injuries seen had been reported to the child protection services. Some 73% of the children the clinicians considered "likely or very likely" to have been abused were referred and only 24% of the children they considered to be "possibly" abused were referred (Flaherty et al., 2008). Telephone interviews were then carried out with a subset of the primary care clinicians (36 of whom had suspected abuse but did not report the injury to child protection services and 39 who did report suspicious injuries). They found four major themes regarding the clinicians' reporting decisions: familiarity with the family; reference to elements of the case history; use of available resources; and perception of expected outcomes of reporting to child protective services.

It is known that the ability of professionals to know when to refer, what to refer, how to refer and the ability to make referrals swiftly is fundamental to ensuring the right level of support and intervention is provided to children who require it (Munro, 2011). The Department for Education published "Child protection, social work reform and intervention. Research priorities and questions" in 2014 and noted that failures to report may be due to the difficulty in identifying signs of need or CAN, or to a lack of clear referral procedures, or to cultural and institutional factors in specific regulated settings (Department for Education,

2014). They also set out the priorities for future research and in the category of child protection those priorities are:

> "How could professional awareness of abuse and neglect be improved to achieve more appropriate referrals, and what motivates professionals to refer, or not?
>
> What are the barriers which prevent professionals who work with children referring safeguarding concerns about individual children to social services in an effective and timely manner?
>
> What interventions – including training, new procedures or regulations and legal requirements – have been shown to be most effective in improving the quality and consistency of referrals?"

The work of thesis will contribute to these areas of priority research.

2.2.4 How have barriers been targeted/ addressed so far?

A systematic review of the effectiveness of training and procedural interventions aimed at improving the identification and management of child abuse and neglect by health professionals (Carter et al., 2006) found that some procedural interventions (such as the use of checklists and structured forms) resulted in improved recording of important clinical information and may also alert clinical staff to the possibility of abuse. Out of a possible 6883 studies there were 22 that met the inclusion criteria for their paper, and they defined 7 as procedural interventions (structured forms, flowcharts, and reminder checklists) and 15 as training interventions. The training programmes were mainly to multi-professional audiences, often in a community/ primary care setting. Eight of the papers they included described conventional didactic sessions varying in length from a few hours to other courses over several days. Some of the other studies involved interactive training approaches, including: practice based sessions in primary care teams where participants identified key learning points from listening to an audiotape of an adult survivor of childhood abuse; a workshop based on adult learning theory and action research methodologies; the use of focus groups to identify course content followed by a continuing education programme; provision of written feedback for doctors following assessment of documentation of abuse in case notes; and videoconferencing to provide real-time consultations with clinicians who were assessing children. The paper also

included two studies which used computer assisted learning. It was noted there was an absence of rigorous evaluation of the impact of the training programmes. They did find that a small number of one group pre- and post-studies suggested improvements in a range of attitudes were necessary for successful engagement in the child protection process. The authors also noted that effort and resource may have been wasted in poor evaluation research of the interventions in the studies (Carter et al., 2006).

More recently a single blind test-retest randomized controlled trial investigated "iLook Out for Child Abuse" which is a customised online educational intervention for designed to increase knowledge and attitudes of early childhood care and education providers towards their reporting duty. They found that knowledge of reporting duty increased and attitudes towards reporting were improved in the intervention group compared to the control group (Mathews et al., 2017). The study did not look at actual reporting behaviour to see if any difference was observed there.

When looking at studies of how the perceived barriers have been targeted for dental team professionals the main barrier that has been targeted is lack of knowledge. Reporting on the effectiveness of a statewide CAN educational program Needleman et al. (1995) found an increase in self-reported knowledge and awareness of CAN. Welbury et al. (2001) investigated the effect of a computer aided learning package on general dental practitioners knowledge of non-accidental injury, they found a self-reported increase in the knowledge of the general dental practitioners after using the learning package but no pre-test or baseline measurement was included. The effect of the PANDA (Prevent Abuse and Neglect through Dental Awareness) Coalition of Maine training program and the University of Minnesota Family Violence: An Intervention and training module for dental professionals has also been investigated using pre and post-tests of self-reported attitudes and knowledge (Harmer-Beem, 2005). They found that self-reported likelihood of reporting increased after the training program as did self-reported knowledge of how to make a report of CAN. The widely available resource "Child Protection and the Dental Team"(Harris et al., 2006) which is a child protection learning resource for dental team professionals has been investigated to see if it met its intended educational objectives (Harris et al., 2011). Of the dental team professionals surveyed 72.6% reported they had used

the resource to improve their personal knowledge, 68.4% had used it to improve knowledge of the wider dental team and 24.4% as part of wider group learning. There is one study that has used pre- and post-test (Al-Dabaan et al., 2016) to investigate the effectiveness of a web-based child protection training programme for dental practitioners. This training programme consisted of a didactic component of 8 modules and the questionnaire developed asked multiple choice knowledge-based questions relating to each of the modules. The study found higher levels of knowledge immediately after the training, but this was not reassessed later in time. The researchers did, however, send out another questionnaire one month after the training in which respondents self-reported an increased awareness of and confidence in dealing with CAN. As yet no other literature is available on how the other barriers to referral of suspicions of CAN have been targeted/ addressed for dental team professionals.

It has been discussed that basic training in child protection focuses on policies and procedures and that an unintended consequence of this is that it implicitly encourages professionals to pay attention to certain parts of the information of a case at the expenses of the more idiosyncratic and complex information that needs more novel responses or more time to work through (Munro, 2019). Other researchers argue that there is defensiveness in current child protection practices and there is a need to incorporate principles from safety science in order to create a culture in which mistakes are acknowledged, professionals learn from their peers and improve their critical thinking (Cull et al., 2013). To do this leaders in child protection need to move their organisations to embrace transparent communication, build inclusive partnerships with all those involved in child protection and set aside any differences in order to progress their common goal of protection children and safeguarding their welfare (Cull et al., 2013, Munro, 2019). It is argued that training and work environments should create conditions that help professionals develop expertise in both intuitive and analytic thinking as both are used in varying combinations by professionals involved in child protection (Munro, 2019).

2.2.5 Summary of Section 1

There is a gap between the numbers of dental team professionals that suspect abuse or neglect in their paediatric patients and those who refer for appropriate help.

This is a global issue and is not limited to dental team professionals. Other healthcare and education professionals are also known to not always refer cases of suspected child abuse or neglect.

The main barriers to referral for dental team professionals can be broadly grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures).

These barriers must be overcome because child abuse and neglect have significant short- and long-term effects on the victims as well as their wider society and early identification leading to the correct help for children and young people can minimize the negative effects.

Although some barriers have been identified there is a need for further exploration of how dental team professionals working in Scotland perceive their reality with regards to their involvement in child protection. This needs to be addressed as despite the vast literature acknowledging the barriers they are yet to be overcome.

2.3 Section 2 Potential Methodologies & Methods to Generate the required data

There is missing evidence in the literature surrounding how the identified barriers to reporting concerns about CAN by dental team professionals translate into the real world. Why the identified barriers persist does not appear to have been investigated. The reality of dental team professionals working in Scotland needs to be explored, and as such it is important to discuss the ontological and epistemological positions taken in this thesis and why those decisions were made.

2.3.1 Discussion of ontological position.

Ontological positions refer to the nature of reality and what there is to know about the world. The main ontological debates concern whether there is a social reality that exists independently of human ideas and understanding, and whether there is a shared social reality or multiple context specific realities. In the realms of social science there are two main broad ontological positions which are idealism and realism. In realism it is believed that there is an external reality which exists independently to what we believe or understand. In idealism it is believed that no external reality exists independent to our beliefs and understanding. There are subcategories in both broad ontological positions.

Realism includes subcategories of "naïve realism" (Madill et al., 2000) where is it argued that reality can be observed objectively and reliably, "subtle realism" (Hammersley, 1992, Ritchie, 2013) which asserts that an external reality exists but can only be known through the perceptions and interpretations of individuals and "critical realism" (Bhasker, 1975) where reality is said to have different levels including the domain that is experienced through the senses, the actual domain that exists whether it is observed or not and a domain which refers to underlying processes and mechanisms (Ritchie, 2013).

The main schools of thought in idealism are those where it is thought that the world is made up of representations constructed and shared by people in particular contexts, known as subtle or contextual or collective idealism (Madill et al., 2000, Hughes and Sharrock, 1997, Ritchie, 2013), or alternatively others believe there is no shared social reality but instead there is a series of different individual constructs, known as relativism or radical idealism(Madill et al., 2000, Hughes and Sharrock, 1997, Ritchie, 2013).

What appears to be missing from the current literature is the exploration of the dental teams' reality through their own words and interpretations. This fits with subtle realism and, hence, this is the ontological standpoint taken and fits with the use of qualitative methodology.

2.3.2 Discussion of the epistemological position

Epistemology is the theory of knowledge and the distinction between justified belief and opinion. It is concerned with how we can learn about reality and the methods, validity and scope of knowledge. In social research there are debates as to what the best way to acquire knowledge is, how the relationship between the researcher and participants influences the research and what the correct theory of truth is in a social research context. Regarding the acquisition of knowledge the arguments are generally around whether it should be based on induction (where observations provide the basis for theories), deduction (where a hypothesis is derived from a theory and applied to observations and the hypothesis will be accepted or rejected once applied to the observations), retroduction (where a researcher tries to explain patterns in data and identify structures or mechanisms that produced the patterns by trying out different models) and abduction (where a social scientific / technical account of reality is created from descriptions of everyday activities, beliefs and ideas using participants language). This thesis employs elements of induction and deduction in that the literature review helped develop theory (deduction) but observations from in-depth interviews were inductive in building new theory.

The argument surrounding how the research is influenced by the researcher was important to consider. One argument is that the phenomena that is researched is independent and not affected by the researcher so can be objectively observed, while others argue that in the social world participants are affected by being studied and the researcher cannot be entirely objective (so called value-mediated findings). There is a third argument that aims to find middle ground between the first two opposing arguments. This third option recognises that researchers should do their best to make their assumptions, biases, and values clear and transparent and endeavour to be neutral and non-judgmental, this is sometimes termed “empathic neutrality”(Ritchie, 2013). Researchers have an obligation to take into account the personal and interpersonal nature of qualitative research as it is recognised that who the researcher is, what is occurring in a researcher’s personal life, what they care about and why or how they have decided to study their chosen subject will affect their data collection and interpretation (Patton, 2015). This third argument is the approach taken in this thesis.

The traditional main theory of truth in the natural sciences has been correspondence theory meaning that observations or data about the natural world correspond to an independent reality (there are various versions of this theory). In comparison the coherence theory of truth argues that if several reports confirm a statement, it can then be considered a true representation of social reality, although it is not true independently. This is generally argued as a more appropriate theory of truth than the correspondence theory for social research (Ritchie, 2013). Another alternative view is the pragmatic theory of truth where true statements are those that are useful to believe, that are the result of inquiry, that have withstood ongoing examination, or if the interpretation leads to actions that produce desired or predicted results. Pragmatism is an accepted and justifiable approach within social science (Ritchie, 2013, Capps, 2017).

2.3.3 Qualitative methods in context of current literature

Given these ontological and epistemological positions qualitative methods are appropriate and have been lacking from the literature on the involvement of dental team professionals in CAN. It has been consistently shown in the literature that there are barriers to reporting concerns about CAN by dental team professionals, but why these barriers persist has not been investigated. It is essential to understand why dental team professionals continue to act in the way they do even though it seems the barriers have all been identified and steps taken to try and address them. Qualitative research aims to capture and understand individuals perspectives as well as how that relates to the systems that they are part of such as their social, familial, organisational and economic systems (Patton, 2015). The methods that have been used in the literature so far to identify the barriers to referral for dental team professionals have been the use of closed questionnaires in quantitative studies which have reported the percentages of dental team professionals who agree with the suggested barriers, while other questionnaires have attempted to link respondent characteristics to their likelihood of reporting and focus groups have explored what the barriers may be. These methods contributed to knowledge of the presence of the barriers but not to the perceived missing knowledge that we have identified (namely why these barriers persist and how they could be overcome). Other literature has looked at how barriers have been targeted or addressed so far

(section 2.2.4) and have reported that interventions tend to be procedural or target the perceived lack of knowledge but again there is missing knowledge as to how such barriers could be overcome or what the preferences for those involved (dental team professionals themselves) are.

2.3.4 Summary of Section 2 Potential Methodologies and Methods

The ontological position (summarised in Table 2.7) taken in this thesis is that of subtle realism where is it believed that an external reality exists independent to what we believe or understand but it can only be known through the perceptions and interpretations of individuals.

Epistemologically this thesis utilises deduction in the building of our hypothesis, and the identification that there is missing data. As the missing data has not been identified before a bottom-up or inductive approach is appropriate to gather new information to build new theory. In doing this it is essential that the assumptions, biases, and values in this research are clear and transparent as this affects data collection and interpretation. The aim being to endeavour to be as neutral and non-judgmental as possible and clearly explain this. This thesis also subscribes to the pragmatic theory of truth where true statements are those that result from the inquiry, stand up to examination or the interpretation of which leads to the desired or expected outcome.

Table 2.7 Summary of Ontological and Epistemological Position

Methodology	**Ontological Position**	**Epistemological Position**		
		Acquisition of knowledge	**Relationship of researcher to research**	**Theory of Truth**
Qualitative Research	Subtle Realism	Deduction and Induction	Empathetic neutrality	Pragmatism

2.4 Section 3 Pedagogic practices for approaching key factors

2.4.1 Discussion of Potential Approaches

As noted in section 1 the main barriers to referral for dental team professionals can be broadly grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures). When it comes to approaching these key factors there are various possible pedagogical approaches. As the target audience for this research is dental team professionals then the chosen approaches must be suitable for adult learners. Potential pedagogical approaches include behaviourism, constructivism, social constructivism (inquiry-based, reflective, collaborative, and integrative) and liberationism.

Behaviourist learning argues for approaches that include activities which produce a change in observable actions and knowledge is delivered through the teacher. This is seen in elements of traditional teaching delivered by lectures or rote learning. In training programs behaviourist approaches are sometimes appropriate if the learning outcomes associated with training are clearly measured and demonstrated behaviourally (Anderson and Dron, 2011). It would seem for the key factor of lack of knowledge (of referral procedures) that this pedagogical approach would be useful and is likely the approach used traditionally in training programs to deliver this knowledge, yet barriers have persisted for years, this is perhaps not the most appropriate pedagogic practice for approaching the barriers we have identified. However, the serious game intervention that we design will have planned and identified, specific learning outcomes (Chapter 5) and will be evaluated to see if there are changes in observable actions and knowledge.

In constructivism and social constructivism, the central notion is that learners construct their own knowledge and understanding (Pritchard et al., 2010). This approach means learners must be active in the process of constructing meaning and knowledge rather than passively receiving information. It can include inquiry-based, collaborative and reflective learning. Collaborative learning

argues for approaches that involve groups of learners working together to solve a problem, complete a task, or create a product (Laal and Laal, 2012). These are the main pedagogies for approaching the key factors in this research. Learners need to be actively involved in constructing the meaning and knowledge of what their uncertainties, fears and lack of knowledge are and how to challenge them.

A liberationist approach is one where the student voice is placed at the centre of learning and teaching. The needs, hopes and strengths of the learners drive what the appropriate approach should be. Value is placed on having the teacher as a learner, and the students and teacher discovering subjects together (Brosio, 2000). This is possible in a serious game approach to a certain degree as the players will come with different backgrounds and learning needs and elements of their needs, hopes and strengths will be sought in the in-depth interviews (Chapter 4).

The Royal College of Paediatrics and Child Health published “Safeguarding Children and Young People: Roles and Competences for Healthcare Staff” (Royal College of Paediatrics and Child Health, 2014) and in it they note that gaining knowledge, skills and expertise in safeguarding/child protection should be seen as a continuum. They recognise that professionals will increase their skills and competence throughout their undergraduate and post-graduate careers. They also note that any training in child protection needs to be flexible and encompass different learning styles and different learning opportunities.

When considering options for tackling fear the type of fears that are discussed as barriers are fear of making the wrong diagnosis and fear of outcomes such as violence. In general, these are fears of things that the dental team professional cannot control. Telling a dental professional that these outcomes are unlikely and showing evidence of this or indeed lack of evidence of these outcome occurring, as has been done in previous child protection training, did not seem to reduce the numbers of dental team professionals who felt they were barriers (Harris et al., 2013). These fears need to be challenged in another way and this will be discussed in Chapter 5.

2.4.2 How do dental professionals choose CPD topics?

Continued professional development (CPD) is how dental team professionals develop, maintain, and update their skills and knowledge and it should continue throughout their professional lives. It is defined by the General Dental Council (GDC) as "learning, training or other developmental activities which can reasonably be expected to maintain and develop a person's practice as a dentist or dental care professional, and is relevant to the person's field of practice" (General Dental Council, 2018). There are many topics available for dental team professionals to choose from. In the UK the guideline given to dental team professionals regarding CPD comes from the GDC who introduced "Enhanced CPD" in 2018 (General Dental Council, 2018). This enhanced CPD is designed to be flexible, so that dental team professionals can plan activities to suit their needs and adapt them as required across their CPD cycle. All dental team professionals who are registered with the GDC must do CPD regularly, completing at least 10 hours every 2 years and ensuring they complete their minimum number of required hours over a 5-year cycle (100 hours for dentists and 50 or 75 hours for the other registrant categories). CPD records must include a personal development plan, a log of CPD completed and documentary evidence as well as an element of reflection. Every CPD activity must have at least one of the GDC's development outcomes. The GDC highly recommends medical emergencies, disinfection and decontamination and radiography and radiation protection as CPD topics and include another five topics (legal and ethical issues, complaints handling, oral cancer: early detection, safeguarding children and young people, safeguarding vulnerable adults) as further recommended topics.

In a literature review of 114 papers concerning continuing professional development for dentists in Europe Barnes et al. (2012) found that most dentists do engage in CPD. They reported that certain factors affected participation including time since graduation (with those more recently qualified, and those close to retirement age being the least likely to participate), costs, work and home commitments, postgraduate qualification, interest, and convenience. There were various methods of CPD delivery included in the review such as course, lectures, journal reading, and on-line learning and no delivery method appeared to be more effective than the others. When reviewing how dentists

chose their CPD topics they found that there are various reasons which include interest and availability rather than the professional's own identification and reflection on their learning needs. Many of the papers reviewed focused on what dentists might want to study rather than what topics would be recommended or considered essential. In the review there were only a few studies of CPD that attempted to evaluate the effectiveness and impact of CPD and those that did mainly used self-reporting pre- and post- test questionnaires to assess change in knowledge or clinical practice. The papers reviewed also noted that there were barriers to implementing change in workplace practice including availability of materials, resources, and support from colleagues.

After this review a paper was published providing guidelines for the organisation of CPD activities for European dentists (Suomalainen et al., 2013) which advises that those providing CPD should be quality-approved and impartial, suitably trained, and have educational expertise. They advise that the mode of CPD delivery should suit the educational activity, with clear learning objectives or outcomes and effort should be made to assess the learning. Additionally, feedback should be collected and analysed. These are all relevant points which will be considered in the development of our serious game intervention. Following this a qualitative investigation including semi-structured interviews and a focus group explored general dental practitioners' opinions about CPD (Stone et al., 2014) in the Northeast of England. They found that the participants "placed a great deal of importance upon having discussions and engaging with colleagues when considering a range of topics including treatment options, new materials, procedures and their own CPD."

In summary there are many different factors that affect how dental team professionals chose their CPD topics. Of relevance in the UK safeguarding of children is a recommended CPD topic but clearly to encourage uptake of CPD in this area it needs to be convenient, not too costly and be a topic that is discussed with colleagues.

2.4.3 Summary of Section 3 Pedagogic Practices for approaching key factors

Social constructivism where learners are actively involved in constructing the meaning and knowledge of what their uncertainties, fears and lack of knowledge are and how to challenge them is the main pedagocial approach taken in this research. There will also be elements of a liberationist approach as the needs, hopes and strengths of the learners will drive what the appropriate approach should be. In the serious game approach, the players will come with different backgrounds and learning needs and elements of their needs, hopes and strengths will be sought in the in-depth interviews. The serious game approach also fits with the necessity of CPD for dental team professionals to be convenient, not too costly and be something that can be discussed with colleagues.

2.5 **Section 4 Serious Games**

2.5.1 Why might serious games be useful in this situation?

'Serious Games' enable interactive and cognitive engagement with content. They are often used to reach audiences that may find it difficult to engage with a topic or understand complex causal problems. A game can break such problems down over time, allowing for player reflection on the game premise, and their own in-game and real-life behaviours. Consequently, a serious game can have a major role in education for areas of the curriculum that require engagement and reflection. Matching the actions, or 'game mechanics' to specific learning outcomes is key to serious game development for game-based learning (Arnab et al., 2015).

There is evidence that games can improve knowledge, and "lack of knowledge" is one of the barriers that has been noted in the literature pertaining to why dental team professionals do not always refer. Wolfes's meta-analysis demonstrated that games-based approaches gave improved learning outcomes and significant knowledge gains when compared to conventional teaching methods (Wolfe, 1997). In Vogel's meta-analysis there were higher cognitive

gains for participants using games or simulations compared to those being taught with conventional methods (Vogel et al., 2006). Sitzmann's meta-analysis showed higher procedural and declarative knowledge in trainees taught using games-based learning approach when compared to trainees taught using conventional methods (Sitzmann, 2011). A systematic review of 129 papers by Connolly et al. (2012) demonstrated that the most frequently occurring outcomes and impacts of serious games were knowledge acquisition/content understanding and affective and motivational outcomes. It has also been shown in another meta-analysis that games are more effective when used as part of a blended learning approach such as including a debrief after the game (Hays, 2005) and it is intended that the game designed as part of this research will be used in such a manner.

2.5.2 What is a serious game?

There are many definitions surrounding what a serious game is, but most agree that a serious game is a game designed for a primary purpose other than pure entertainment. Serious games have specific intentional learning outcomes. The earliest definition of a serious game appeared in 1970 (Abt, 1970) where they described serious games as having an "explicit and carefully thought-out educational purpose and are not intended to be played primarily for amusement." Although this is the earliest definition that appears in the literature, games have a long history of being used in human culture for purposes other than amusement. War games have been used to prepare battle plans and simulate battles, other games have been used for teaching counting skills, even simple card games like snap can be used to teach skills in identifying matching symbols or colours or numbers, and table-top games such as SCRABBLE, which are usually played for entertainment, have been used for a serious purpose when they are used to help children or other people learn to spell words.

There is a difference between gamification and serious games which is important to understand as both have been used in the healthcare field. Gamification uses some game mechanics in non-game situations to influence the participants' behaviours. For example, this might be using points or badges to motivate the participants. The actions themselves, however, take place outside of the game

rather than within the game. A relevant example of this in dentistry would be the Brush DJ App (www.brushdj.com) which is described as a "tool to motivate an evidence-based oral hygiene routine"(Underwood et al., 2015). In this mobile phone application 2 minutes of music either from a playlist or randomly taken from the user's device or cloud is used to motivate users to brush for the full 2 minutes. It also reminds users to spit out after brushing and not to rinse and provides other age-appropriate oral health information. The reward is a round of applause at the end of the 2 minutes of brushing but the actions (the tooth brushing itself) takes place outside of the game. Gamification has also been used in dentistry for developing academic writing skills in dental undergraduates (El Tantawi et al., 2018) where students could collect points and badges for the submission of their required academic writing assignments. In other healthcare areas gamification has been used with Twitter microblogging and shown to encourage academic reading and increase examination rankings in surgical residents in America (Lamb et al., 2017).

Serious games are also not the same as simulation which provide standardised, repeated practice as well as specific feedback (Issenberg et al., 2005, Cook et al., 2013). Simulation is widely used in the education of healthcare professionals and bridges the gap between the classrooms and lecture theatres and the clinical environment. In dentistry simulation is used in both undergraduate and post graduate teaching of pre-clinical skills (hand skills such as using clinical instruments, or the use of haptics) and in the teaching of communication skills (with the use of actors as patients etc). Across healthcare, in different specialties and for interprofessional education, simulation is used for training and education, evaluation and assessment, performance support, innovation and exploration and culture change (Zajac et al., 2020).

The importance of play in the learning process has been discussed for decades. There is general agreement that learning through play is efficient, and that game-based approaches can provide valuable contributions to many health domains. However, game-based health interventions are often targeted at patients, or parents of patients, rather than practitioners or students.

The pedagogy of serious games includes some key learning theories such as motivation and engagement, constructivism, experiential learning, social

learning theory and self-determination theory (Donovan, 2012). Arnab et al. (2015) introduced the concept of serious game mechanic which they defined as "the design decision that concretely realises the transition of a learning practice/goal into a mechanical element of gameplay for the sole purpose of play and fun." They note that serious games need to demonstrate the transfer of learning while also being engaging and entertaining (Arnab et al., 2015). Their paper introduces the Learning Mechanics and Game Mechanics (LM-GM) model which is useful for identifying the main learning and game mechanics in each game situation. The principles of learning and gameplay are not the same, but both are required for a serious game to have a serious purpose (through the learning mechanics) and still be a good game (through the game mechanics). In essence there needs to be a mapping of game mechanics onto learning mechanics which is the definition of a serious game.

2.5.3 How have serious games been used in healthcare?

There are many serious games in the field of health. A review of 108 games from January 2004 to December 2012 proposed a way of classifying this plethora of games (Wattanasoontorn et al., 2013). They suggested that these games could be classified by game purpose (whether they were focused on entertainment, health or acquiring health or medical skills), game functionality, stage of disease (susceptibility, pre-symptomatic, clinical disease or recovery/disability stage) and type of player (patient/non-patient and professional/non-professional) (Wattanasoontorn et al., 2013). Although dental health may have been included in the "other" or touched on in "general health" they did not identify any games that were for the field of dentistry. Fifty-one of the games they reviewed were for educational purposes but this included self-education, training for non-professionals and training for professionals. None of these were in dentistry. A systematic content analysis of 1743 health games released between 1983 and 2016 found that the most popular health topics represented were cognitive training (37.41%), indirect health education (13.33%), and medical care provision (9.98%)(Lu and Kharrazi, 2018).

A serious game has been used to improve the knowledge of antibiotic resistance and its relationship to dentistry and found it showed better retention than a conventional lecture (Aboalshamat et al., 2020). Although the game itself was

not aimed at dental team professionals it does provide an example of then being used in the broader field of dentistry.

One of the more well-known serious games in healthcare is Re-Mission (HopeLab, 2004) (www.re-mission.net) which is a serious video game targeted at adolescents and young adults and shown by randomized controlled trial to improve treatment adherence and indicators of cancer-related self-efficacy and knowledge (Kato et al., 2008). In the game players control a nanobot, "Roxxi," within the bodies of young patients with cancer to ensure that the virtual patients engage in positive self-care behaviour (for example by taking oral chemotherapy to fight cancer cells and practicing good mouth care to combat mucositis among other desirable behaviours).

2.5.4 What areas of serious games could be relevant to our specific area of interest and research?

There are potentially many areas of serious games that could be relevant to our specific area of research. These are summarised in Table 2.8. As previously discussed, there are various barriers to referring cases of suspected child abuse and neglect (CAN) for dental team professionals (especially fear, uncertainty and lack of knowledge) so it was relevant to look at the literature for serious games that are targeted at these areas. Additionally, games aimed at improving decision making abilities could be relevant, or games that produce a contextualised collaborative experience through which players can explore and reflect on their experiences as well as benefiting from others experience would also be relevant. Thinking at a higher level strategic or tactical games could have some value as the referral of concerns starts a multi-agency response. As some referrals are of concerns in crisis situations then games aimed at safety or crisis response could also have merit. Other games that have been shown to affect knowledge or skills or abilities may have some relevance or a game that allows an in-depth exploration of a topic could also be potentially useful.

Table 2.8 Table of Potentially Relevant Areas of Serious Games with Examples

Potentially relevant areas of serious games	Example of a game that addresses relevant area	Supporting Literature
Improve ability to take correct actions in difficult decisions	Project Crashing Game and Program Crashing Game	(Rumeser and Emsley, 2019)
Contextualised collaborative experience	VR-Active Learning Module	(Prasolova-Forland et al., 2017)
Strategic/ tactical game	Tactical Iraqui	(Surface et al., 2007)
Safety and crisis response	Anaesthesia Crisis Resource Management Serious Game	(Shewaga et al., 2018)
Overcoming fears	Live Beyond Fear- A Serious Game to Deal with Acrophobia	(Sharmili and Kanagaraj)
Overcoming uncertainties	SELECT ECOTECH	(Powell et al., 2021)
In-depth exploration of a topic	SimPort- MV2	(Bekebrede et al., 2015)
Affect knowledge, skills and attitudes	Re-mission	(Kato et al., 2008)

2.5.5 Summary of Section 5 Serious Games

'Serious Games' enable interactive and cognitive engagement with content. They are defined as games designed for a primary purpose other than pure entertainment with game mechanics mapped onto learning mechanics. There are many serious games in the field of healthcare, but none currently published are aimed at dental team professionals. As well as looking at serious games in healthcare the other areas of serious games that could be relevant to this research include games that improve player's ability to take correct actions in difficult decisions, games that provide a contextualised collaborative experience, strategic/ tactical games, safety and crisis response games, games for overcoming fears, games for overcoming uncertainties and games that allow an in-depth exploration of a topic.

2.6 **Conclusion of Literature Review**

This literature review has explored the perceived problem that dental team professionals do not always refer their concerns about potential child protection or safeguarding issues to the appropriate individuals. The gap between the numbers of dental team professionals that suspect abuse or neglect in their paediatric patients and those who refer for appropriate help is a global issue and is not limited to dental team professionals.

We have identified the main barriers to referral for dental team professionals in the literature. They can be grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures). It was discussed that the barriers must be overcome because child abuse and neglect have significant short- and long-term effects. There remains a need for further exploration of how dental team professionals working in Scotland perceive their reality with regards to their involvement in child protection as despite the literature acknowledging the barriers they are yet to be overcome.

The ontological position was discussed, and the position taken in this thesis is that of subtle realism. Epistemologically this thesis utilises deduction in the building of our hypothesis, and the identification that there is missing data. For the missing data an inductive approach is appropriate to gather new information to build new theory. The relationship of researcher to research endeavours to be that of empathetic neutrality. This thesis subscribes to the pragmatic theory of truth.

The main pedagogical approach taken in this thesis is social constructivism. There will also be elements of a liberationism. The serious game approach also fits with the necessity of CPD for dental team professionals to be convenient, not too costly and be something that can be discussed with colleagues. ‘Serious Games’ enable interactive and cognitive engagement with content and are defined as games designed for a primary purpose other than pure entertainment. There are many serious games in the field of healthcare, but none currently published are aimed at dental team professionals so other areas of serious games that could be relevant to this research were discussed.

Chapter 3 Research Methodology

3.1 Introduction

Chapter 2 showed us that some barriers to reporting concerns about CAN have been identified for dental team professionals with the main barriers broadly grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures). There remains the question of what this means outside of the academic debate or if it translates into the real world. In this chapter we discuss the methodology for an exploration of the reality of dental team professionals working in Scotland. This part of the research falls within the philosophical position of subtle realism (Hammersley, 1992, Ritchie, 2013), where reality is seen as something that exists independently of those who observe it but is only accessible through the perceptions and interpretations of individuals. As discussed in Chapter 2 we take the ontological position of "subtle realism" (Ritchie, 2013, Hammersley, 1992) which asserts that an external reality exists but can only be known through the perceptions and interpretations of individuals. As such external reality is complex and diverse with many factors at play, and this research aims to capture this. This approach is broadly interpretivist (Ritchie 2013) and existing research and theories (literature review and prior subject knowledge) assisted in the design of this study, including how the sampling approach (purposive sampling framework) was developed and the tools that were created for the fieldwork (In-depth interview topic guide). The interviews and the early analysis will focus on getting detailed information and understanding and explaining the participants' views and experiences from their own perspectives. The research aims to map the complete spectrum of opinions and experiences that dental team professionals report regarding child protection. Following the interpretivist approach the analysis of the findings will then be put back into the context of existing theories and knowledge. Where analysis and findings draw on wider theories and the author's interpretations, it will be explained how these relate to the data collected. The research findings in the context of existing theories and knowledge will give us our model of reality (Harteveld, 2010). Harteveld notes that "reality is interpreted, constructed, and translated into a model by a group of designers in collaboration

with others". In this case the collaboration is with dental team professionals participating in the interviews.

To answer the questions posed in this part of the study, the research needed to have both contextual and explanatory functions (Ritchie 2013). Contextual research describes the nature of what exists, and explanatory research examines the reasons for what exists. The research aim for this part of the thesis was to map the range of definitions that dental professionals use for child protection, child abuse, neglect, welfare concerns, safeguarding and referral (contextual), and their meaning of "being involved in child protection" (explanatory).

The resulting map of opinions, views and experiences together with the literature review will provide a strong foundation for the model of reality (Harteveld, 2010), and subsequent serious game.

The important question to be answered by this part of the research is: - **"What is involved in the decision by a professional member of the dental team to refer or not refer a paediatric patient to the appropriate services and what influences this decision?"** This is linked to overall objectives 1 (Investigate thoroughly the factors related to referral of child protection concerns by dental teams in Scotland and prioritise them) and 2(Understand the issues from the perspective of dental team members practicing in Scotland).

A qualitative approach (Ritchie, 2013) was used as previous research has not fully explained why dental professionals do not always refer concerns about child abuse or neglect (see Chapter 2). Although some barriers have been identified there is a need for further exploration of how dental team professionals working in Scotland perceive their reality with regards to their involvement in child protection. This needs to be addressed as despite the vast literature acknowledging the barriers they are yet to be overcome. The issue is complex and sensitive and difficult to address and needs further exploration. Previous quantitative research has valuable information about the prevalence of referrals and the experiences of having concerns about paediatric patients (Cairns et al., 2005, Harris et al., 2013). However, an in-depth investigation of the topic should involve questions that are responsive to individual participant circumstances, as well as skilled and sensitive handling of interviews to help

participants describe their feelings and emotions. This can be achieved using qualitative methods.

All factors related to the identification of suspicions of child abuse/ neglect by dental team professionals and their subsequent decisions to refer or not, need to be investigated. The literature review identified previous work that had attempted to understand the issues involved (chapter 2). The main barriers to referral for dental team professionals in the literature can be broadly grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures). Many of the identified fears have been targeted by training but there are clearly other issues involved in the decision to refer. The feelings and emotions for the referrer are unknown. Referral may be affected by beliefs, previous experience, time pressure, personal emotions, or other factors not yet clear. Before the gap between having a suspicion and referring can be targeted it is important to understand why it exists and whether it will ever be possible to eliminate it. It important to address the gap because there must have been some welfare concerns that aroused suspicion in the first place and getting help from the appropriate agencies will reduce morbidity and mortality. All types of abuse and neglect are associated with poorer mental health and other longer-term health consequences (cancer, chronic lung disease, fibromyalgia, irritable bowel syndrome, ischaemic heart disease, liver disease, and reproductive health problems). Early identification and referral of children is thus critical.

3.2 Research Aim for Qualitative Approach

To explore what is involved and what influences the decision by a member of the dental team professionals to refer or not refer a paediatric patient to appropriate services.

3.3 Research Question and Sub-questions

The overall research question for this thesis was “What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?” The research

methodology for this section focused on answering the first part of the overall research question and this was broken down further into 8 specific sub questions about the factors involved, which were influenced by the findings from the literature review namely:

1. What is involved and what influences the decision by a dental team professional to refer or not refer a paediatric patient to appropriate services?

2. What do the terms child protection, child abuse, neglect, welfare concerns, safeguarding and referral mean to dental professionals?

3. How do the dental team professionals pick their continued professional development topics?

4. What training in child protection have the dental team professionals had and what was good or bad about it?

5. How do the dental team professionals feel when they have had cases they were concerned about?

6. What influenced the decisions of members of the dental team professionals?

7. What rules and regulations are members of the dental team professionals aware of?

8. What are the feelings of the dental team professionals towards child protection in a wider sense/ outside of their professional responsibilities?

3.4 **Qualitative Research methodology**

The data required to answer the questions most effectively was generated data rather than naturally occurring data. Generated data is data created specifically through the research process by an interaction between the researcher and participant. It allows participants to describe their personal context in which the research issue is located. In this study generated data was important as it

allowed participants to describe and explain their experiences of child protection in dentistry from a personal standpoint. This would have been unachievable using naturally occurring data such as media coverage, case files, and policy documents etc. An extensive qualitative research exercise was key towards investigating the reality model of triadic game design

3.4.1 In depth interviews

Generated data was required to answer the research questions and the two main methods of data collection, namely focus groups and interviews were considered. Both these methods are based on verbal communication and the spoken narrative. Following the philosophy of subtle realism these methods are valuable as it is believed that participants can verbally communicate perceptions and interpretations about their social reality. Interviewing as a method has received criticism for being a "stubbornly persistent romantic impulse in contemporary social science: the elevation of the experiential as the authentic"(Silverman, 2019). However, qualitative interviewing still provides the best chance for a comprehensive investigation from each participants perspective, thus achieving a full understanding of their personal situation within the research topic, as well as giving thorough coverage to the topic of interest. A summary of the process involved in in-depth interviews is shown in figure 3.1 below. Interviews were chosen as a method due to factors related to the type of data that was sought, the subject matter of the research, and the research population themselves. Each of these factors will be discussed in turn.

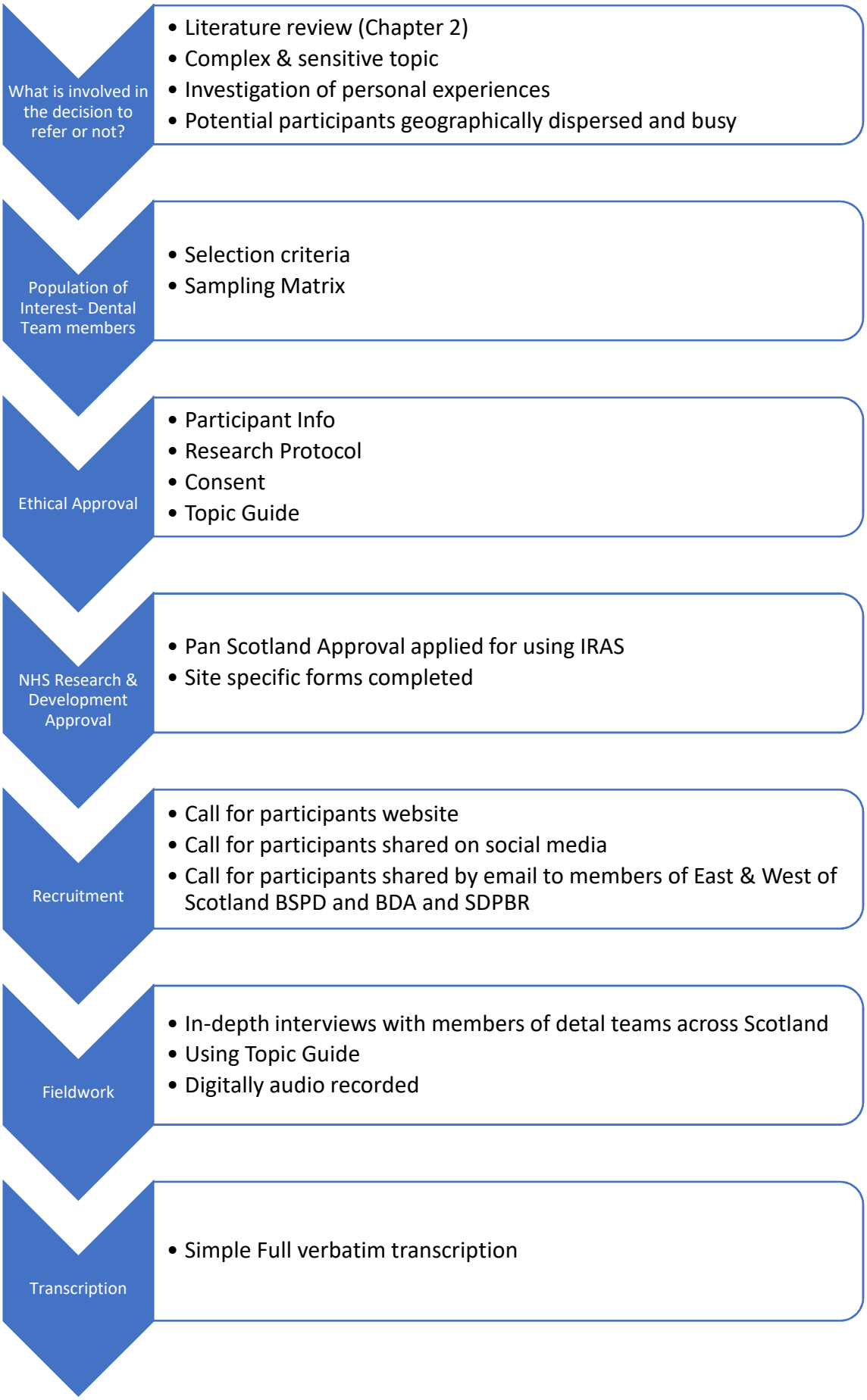


Figure 3.1 Summary Diagram of the Process of In-Depth Interviews

3.4.1.1 Type of data sought

The type of data sought was a comprehensive investigation of personal perspectives and experiences. For a complex and sensitive topic involving personal experiences of involvement in child protection referrals, in depth interviews were the obvious choice. Focus groups were considered but they offered less opportunity for the collection of detailed individual data that was needed to answer the research question. Semi- structured interviews were also considered but as the items in these interviews are fixed, they were deemed inappropriate for this investigation which required flexibility if participants wished to talk in-depth about their experiences.

3.4.1.2 Subject matter of research

Child protection is a complex and sensitive subject. Focus groups can be used to explore sensitive subjects, but care would need to be taken to ensure individuals in the focus groups have similar experiences in the issue under investigation. The research was particularly interested in mapping the range of experiences, so focus groups were not appropriate. Individual interviews were the best choice as they allow in-depth focus and the ability to gain clarification to allow thorough understanding. The research also aimed to understand motivations, decisions and impacts, and this necessitated personal focus that comes from individual interviews (Ritchie, 2013).

3.4.1.3 Research Population

This study was aimed at collecting the views and experiences of dental team professionals from across Scotland. The potential study population was geographically dispersed, and participants would also have busy professional lives and be less likely or willing to travel to a common location for a face-to-face interaction. As the topics were potentially sensitive, the ability to choose where participants would like to be interviewed ensured they were as comfortable as possible.

3.4.2 Study Design

In-depth exploratory interviews were used to explore situations when participants had child protection concerns. There was one interview with each research participant providing an in-depth snapshot of their views and experiences, thus allowing the researcher to map the range of experiences. The same issues in child protection in dentistry have persisted for some time, therefore there was no benefit to repeat interviewing.

3.4.2.1 Population of interest

The population of interest were dental team professionals in Scotland working in primary care. The research was situated in Scotland rather than the whole of the UK due to the geographical constraints and the differing legislations and NHS structures between the devolved Nations in the UK.

3.4.2.2 Selection Criteria

Inclusion and exclusion criteria were set by the researcher to ensure the participants had relevant professional responsibilities (registration with the GDC ensured this), could communicate verbally and understand the written information. Additionally, the exclusion criteria ensured safety of the participants.

Principle inclusion criteria were: current or recently active Scottish Dental Team professional (retired not more than 2 years previously) holding, or having held, full registration with the General Dental Council (GDC) at the time of their activity with a dental team, fluent English speakers, able to understand written English, and over 16 years old.

Principle exclusion criteria were: any condition or circumstance which may affect the participants capacity to consent to involvement in the research project such as illness or injury, anyone who after reading the participant information felt that involvement in the research would be too upsetting or cause an exacerbation of any current medical condition, or those with no relevant experience of working in a Scottish Dental team.

3.4.2.3 Sampling

Purposive sampling was chosen to gain a selection of participants that would be information rich. Purposive sampling cannot overcome all the issues with generalizing from small samples, but it does allow a study design so that the most appropriate cases can be chosen (Seawright and Gerring, 2008). Purposive sampling still has similar objectives to random sampling in that it aims to have a representative sample that has some useful variation. Purposive samples are linked to the wider population in terms of conceptual significance (rather than a probability sample which is generalized based on statistical probability). This did not mean that all cases would be suitable, and much thought was put into the design of the purposive sample. As noted by Silverman (Silverman, 2019) "purposive sampling demands that we think critically about the parameters of the population we are interested in and choose our sample case carefully on this basis". Purposive samples can provide a broad cross section which is heterogenous allowing for comparative understanding or alternatively can be more homogenous to allow in-depth understanding. A purposive sample was selected to give a heterogeneous/ broad cross section of professional members of the dental team to allow comparative understanding. The target population included dental practitioners, dental nurses and dental hygienists/therapists working in dental primary care/ general dental practice/ public dental service in Scotland. Fifteen initial purposive selection criteria were identified (Table 3.1). This was based on all the criteria that could potentially be linked to differing view/ opinions/ beliefs and provide the rich heterogenous data that was desired.

Table 3.1 Table of Initial Purposive Selection Criteria

Initial purposive selection criteria	Logic for inclusion
Age	With increasing age, participants may have more experience in both their personal and professional lives to draw on. Younger participants may have different perceptions and ideas to older participants.
Gender	Gender may have a role in the views espoused. Traditionally it is thought that females may be more nurturing and so may be more likely to have had concerns about paediatric patients' welfare.

Regional location	It is not known if urban versus rural or densely populated areas versus less dense areas may give different experiences of concerns about child protection. Theoretically it was considered that those in densely populated urban areas may have seen more cases of concern.
Number of dentists in practice	Those working in a single-handed practice may have concerns but fewer people to help or share those concerns with. It was important to see if there were differing feelings/ experiences of managing concerns from those in small practices compared to those in larger practices.
Deprivation area of practice- SIMD quintile	Child abuse and neglect affects all social classes, but it is also known that families in more deprived areas have a higher burden of dental disease, so this was included as a criterion to see if there were differences/ similarities in the types of cases that participants reported, depending where their work was situated.
Family unit composition/ marital status	Those with their own children or those who were married/ cohabiting may have different experiences or reflect differently on their experiences compared to those who were single or did not have children of their own.
NHS only or mixed NHS/ private	Those who provided NHS care only were more likely to have a higher number of paediatric patients and have a faster turnover of patients. It was theorised that this might provide different stressors and motivators to the dental professionals and this spectrum of views would be important to map.
Income level	Higher income earners would either be doing more private work or have a very quick turnover of patients. This may affect their motivators to behave in certain ways.

Full time or part time employment	The experiences of those working full time and part time could potentially be different in terms of what pressures they are under, work/life balance and what other things are going on in their lives. All of these may give rise to different beliefs/ views/ opinions/ experiences and reflections.
Small or large community	Living in a small community may mean that the dental professional is more widely known and that incidences may have bigger impacts upon their practices compared to larger communities where professionals may be less well known.
Living in same community as work in	This may influence behaviours as professional decisions may spill into family life.
Previous referral status	There may be a difference in views between those who had referred before and whether it had gone well or not as well, compared to those who had never referred.
Years since qualification	With increasing years since qualification, it was thought that participants may have more experience in both their personal and professional lives to draw on.
Type of dental care professional	It was important that the views of dentists as well as other dental care professionals were mapped. The dentist often takes the lead on child protection concerns as well as being the team leader. The comparison between their views and experiences compared to dental nurses, practice managers etc were mapped to enable comparison.

This list was refined to the 12 most important (primary) and 3 less important (secondary) criteria (Table 3.2). After discussion it was felt that the 3 secondary criteria (income level, regional location, and age) would be represented in the sample under type of employment, type of dental care professional, SIMD quintile and years since qualification.

Table 3.2 Table of Primary and Secondary Purposive Selection Criteria

Primary Criteria	Secondary criteria
Years since qualification	Age (absorbed in years since qualification)
Gender	Income level (absorbed in type of employment, and type of dental care professional)
Number of dentists in practice	Regional location (absorbed in SIMD quintile)
Deprivation area of practice- SIMD quintile	
Family unit composition/ marital status	
NHS only or mixed NHS/ private	
Full time or part time employment	
Small or large community	
Living in same community as work in	
Previous referral status	
Years since qualification	
Type of dental care professional	

The ideal number of participants for each criterion is a symbolic, rather than a statistical representation and is based on the required range and diversity of the sample not on the distribution in the wider population. It is therefore dependent on the diversity of the target population (in this case the dental teams) and the number of selection criteria (in this case 12 primary criteria).

Primary criteria were entered into a sampling matrix table (Table 3.3) to give a sample size of 18 to 50 participants which is in keeping with average participant numbers in qualitative research. Small samples are normal in qualitative research due to feasibility, costs, time, handling of data collection and analysis, and the saturation of data. The aim is to map the range of views/opinions/ experiences and not the incidence of them. Once key concepts/ themes are collected there are diminishing returns on collecting further data if the same concepts/ themes are repeated.

Table 3.3 Sampling Matrix Table

	Have referred		Never referred		Family/ marital status	Small community/large community
	M	F	M	F		
< 5 years qualified	1-3	1-3	2-4	2-4	mixture	mixture
5-15 yrs qualified	1-3	1-3	2-4	2-4	mix	mix
15 + years qualified	1-3	1-3	2-5	2-5	mix	mix

Employment status across referral status

Full time	3-5	6-8
Part time	1-5	6-8

SIMD of practice across referral status

SIMD < 3	4-5	6-8
SIMD 4 or 5	1-3	6-8

Type of dental team professional across sample

Dentist	12- 40
Other dental professional	6- 10

Range for total sample 18- 50 participants split between health boards/ regions

3.4.2.4 Development of topic guide

An interview topic guide was developed as a tool following review of the literature, to help the researcher ensure all the topics of interest were covered. The topics of interest were first listed then sorted under main and subtopic headings. The alternative option would have been to first generate main and subtopic headings and then list all the topics of interest (Ritchie, 2013). The next stage was to order the topics in the guide. The main stages of interviews namely introduction and context setting, background, core part of interview and winding down/ summarizing (Ritchie, 2013) were considered and appropriate topics of interest grouped in the relevant stages. More surface level topics were put into the earlier stages of the interview with more in-depth discussions in the core part. Topic guide development resulted in 8 main headings to explore the research question of "What is involved in the decision by a dental team professional to refer a paediatric patient or not, and what influences the decision?" Each main heading was followed by between 2 to 14 subtopic headings (Appendix 1). As the study was essentially exploratory in nature the items in the topic guide and the wording of the questions were open. The order

of the questions was flexible also to ensure consistency in data collection and to allow comparison across participants while also allowing flexibility for participants to give the details they felt appropriate for the particular topics. Essentially the topic guide guided the data collection but was flexible (Ritchie, 2013). The underlying assumption here was that "the participants perspective on the phenomena of interest should unfold as the participant views it (the emic perspective), not as the researcher views it (the etic perspective)". Development of the topic guide was additionally important as it was used as one of the starting points of analysis of qualitative data (Ritchie, 2013)

3.4.2.5 Ethical Approval

The study was deemed not to require NHS ethical approval (Appendix 2) but was given ethical approval by Glasgow School of Art (GSA) (Appendix 3). To gain ethical approval from GSA the both the safety of the participants and the safety of the researcher working off site had to be ensured. Safety of participants was ensured by the exclusion criteria including any condition or circumstance which may affect the participants capacity to consent to involvement in the research project such as illness or injury and any participant who after reading the participant information felt that involvement in the research would be too upsetting or cause an exacerbation of any current medical condition.

Ethical approval also necessitated that valid consent was gained from all participants. This included a participant information leaflet (Appendix 4) given to all potential participants and a signed consent form (Appendix 5) from all those who agreed to take part.

There were several risks and burdens that were considered for the participants. Asking members of the dental team professionals to identify their involvement in cases where they had concerns had the potential to raise ethical concerns. Participants might feel they had not acted ethically. This was addressed by careful development of the interview topic guide in a story telling style which involved asking participants to recall one or two occasions of concern. No pressure was placed upon participants, and they were free to withdraw at any time. If a participant had decided to withdraw, they were free to leave the study and no part of their contribution would be used in the research.

Discussions around concerns about paediatric patients could bring up worries or distresses. The interviewer was trained to refer participants onto appropriate services should they have any unresolved issues.

Confidentiality was another important consideration in the ethical approval process. Person identifiable data was avoided in the recording of the interviews. Participants were asked not to name or give identifiable information about any patient they discuss, but to give a pseudonym if they felt necessary. Each interview was given a code e.g. dentist 1 interview, dental therapist 1 interview, etc. and these were held separately against the list of participants which was kept in a separate secure file.

It was made clear to participants at the start of interviews that although the interviews were confidential, if anything was said that might suggest a child or any other patient or person's safety was at risk then those comments could not be kept confidential and would be reported to the appropriate agency. This, and a participant's decision to withdraw, were the only reasons to identify a participant.

The safety of the interviewer/ researcher also had to be considered in gaining ethical approval. There was a risk of hearing distressing stories, but the researcher was an experienced clinician and had support mechanisms in place through research supervision arrangements, and their own clinical trainers and colleagues should any concerns be raised. The risks to the researcher that were considered are summarized in Table 3.4 and the mitigations taken to reduce risk in the interview situation and ensure that help was at hand are shown in Table 3.5.

Table 3.4 Table of Risks to Interviewer/ Researcher

Risks To Interviewer/ Researcher That Were Considered
risk of physical threat or abuse
risk of psychological trauma (because of actual or threatened violence or due to the nature of what is disclosed during the interaction)
risk of being in a comprising situation, in which there might be accusations of improper behaviour

increased exposure to risks of everyday life and social interaction, such as road accidents and infectious illness
risk of causing psychological or physical harm to others.

Table 3.5 Table of Mitigations taken by researcher

Mitigations taken by researcher
Arranged interviews at a mutually convenient location. This was generally the interviewee or interviewer's place of work and wherever possible interviews took place during the day (e.g lunchtimes). The researcher notified her supervisors of all interview times, dates, and locations
Avoided going by foot to any interview site if feeling vulnerable and used a private car. Routes were planned, and the researcher always took a map.
The researcher avoided appearing out of place by dressing appropriately (inconspicuous and unprovocative) taking account of cultural norms. Equipment and valuable items were kept out of sight during travel, but the digital recording device was in sight during the interviews.
Endeavored to make sure she was seen entering an interviewee's place of work. Care was taken not to compromise interviewee confidentiality
In multistorey buildings, safety was considered when choosing lifts or staircases.
If in the light of prior information where there was any doubt about personal safety, an escort was to wait in the building where the interview took place or in a visible position outside. When waiting outside, a system for communicating was arranged in advance. The researcher arranged to check in with her supervisor or escort at an agreed time.
The researcher carried a screech alarm to attract attention in an emergency.
The researcher let the interviewee know that they had a schedule and that others knew where they were. The researcher kept their mobile phone switched on and arranged for a colleague or escort to phone them at an arranged time.
In all interview situations the researcher assessed the layout and the quickest way out.
The researcher carried identification and gave the researcher's supervisor's telephone number. Respondents were invited to check the authenticity.

3.4.2.6 Research & Development Approval

The study required NHS Research and Development permissions. The Integrated Research Application System (IRAS) Research & Development form, IRAS Site Specific Information form, research protocol (Appendix 6), researcher's curriculum vitae, letter of invitation to participants (Appendix 7), participant information sheet (Appendix 4), consent form (Appendix 5), topic guide for the interviews (Appendix 1), the REC opinion (Appendix 2) and evidence of insurance were submitted for Pan-Scotland NHS R&D approval (14 health boards in total). Research and Development Approval was gained for ten of the Scottish Health Boards NHS Highland, NHS Orkney, NHS Shetland, NHS Grampian and NHS Western Isles did not respond.

3.4.2.7 Recruitment of Participants

Recruitment involved calls for participants sent by email through local dental societies (West and East of Scotland branches of the British Society of Paediatric Dentistry and the Scottish branches of the British Dental Association), placement of a call for participants on the Call for Participants website (www.callforparticipants.com) which was shared through social media as well as invitations sent through social media to dental contacts which could then be shared with a wider audience. In addition, local word of mouth was used. Calls for participants were also sent via the Scottish Dental Practice Based Research Network (www.sdpbrn.org.uk) who were contacted by email and in turn sent by email to all their members. The achieved sample was compared to the ideal sample from the sampling framework as the interviews progressed. When it was noted that the number of other dental care professionals (DCPs) was lower than ideal an email was sent to the tutor of DCPs, who was known to the researcher's supervisory team, and they forwarded the call for participants information onto the DCPs in their tutor group.

3.4.2.8 Conduct of Fieldwork

In- depth interviews were digitally audio recorded and no notes were taken during the interviews. This allowed the researcher's attention to be completely

devoted to listening, responsive flexible questioning and thinking about how the participants were approaching the different topics. Audio recording provided an accurate account of what was said using the participants own language and without the intrusion of note taking. Before each interview, the recording equipment was checked to make sure it was working correctly and at the cessation of each interview it was checked again to check it had recorded properly.

Interested participants were given a choice of times and asked their preferred location for the interview after they had read the participant information leaflet.

3.4.2.9 Transcription Technique

The in-depth interviews were transcribed verbatim by the researcher. In transcribing the interviews, the speech was registered in writing and so made accessible for analysis. Decisions regarding the transcription were a compromise as greater detail gives more material for transcription but too much detail slows down the readability of the text. This decision was related to the research question and the aims of the research. This project required a simple full verbatim transcript. This type of transcription focuses on content but, as well as maintaining the actual words spoken, extra verbal material which is captured on the recording such as use of pauses, hesitation and tone is included in the transcription. Verbatim transcription also requires that the interviewer's words are recorded so that the overall character of the interview is apparent. This included basic features of interviewer-interviewee talk including pauses and responses such as "mmm" and "uh huh" as well as all the interviewer's talk. These are included because an interview is interactional and without inclusion it would be impossible to work out the interactional basis (Silverman, 2017). The benefit of the researcher also being the interviewer and transcriber was that some common pitfalls of transcription could be avoided such as missing, misheard or misinterpreted words (Easton et al., 2000). As the researcher was also a dental professional, she was also used to the dental jargon that was used. Transcripts were checked and re-checked for accuracy prior to analysis.

A set of transcription rules was devised adapted from Dresing et al. (2015) and are summarised in Table 3.6.

Table 3.6 Table of Transcription Rules

General Notes	Documents are to be saved in rich text format as: Int(number)_date_rtf
	Document should include a header on every page with the number of the interview on the left-hand side
	Information about interviewee will be included at the start of the transcript e.g. Marital status, Gender, Occupation, Geographic region
	Insert page numbers at the bottom of each page, in the centre
	Use Calibri, font size 12, type what the interviewer says in bold
	Identify the interviewer and the respondent separately and indicate the gender of the respondent. Use I: for the Interviewer and either F1: or M1: for the respondent depending on whether they are male or female and a number related to what number of male or female participant they were.
Transcription rules	Transcribe literally, do not summarise. Dialects are to be accurately transcribed into standard language unless there is no suitable translation when the word/phrase is to be retained
	A record of what the interviewer says will be included, the one exception is 'back channel utterances', i.e. where I can be heard in the background saying words such as "right", "yeah", "I see" or utterances such as "mmhhmm" whilst the interviewee is speaking. These function to encourage the respondent to continue speaking and reassure them that they are being listened to. It is not necessary to break up the respondent's speech by including them
	Punctuation is as for normal written prose and must not be "tided up".

To be included in full	Unfinished questions or statements that trail off – indicated with ellipses (…), for example: "I never did understand, how to do it, or…"
	False sentence starts
	Repeated phrases, words, statements, or questions
	Discussion that continues after the interview appears to be 'formally' finished
	Non-lexical utterances or 'fillers' e.g. 'umms', 'errs', 'uhs'
	Hesitations and Pauses – indicated with ellipsis (…), e.g. "well…referral to me… means…err…"
	Exclamation mark to indicate an exclamation of surprise, shock, or dismay
	Indicate any emphasis on a word or phrase by putting it in italics
To be included in brackets	Noises in background - for example (loud banging) or (door slams) or (muffled voices)
	The tone of the respondent. Include any comments on mood, feeling, passion, emotion, and paralinguistics – e.g. (laughs loudly), (mumbles slowly), (sounds angry), (falters slightly) or (sighs)
	Mark where unclear phrases occur within the text by placing the word "inaudible" in brackets and in bold e.g. (inaudible).

The transcripts were anonymized by removal of any identifying features of individuals or locations and replacing them with a more general description e.g. "a suburb near Glasgow". Interviewees were referred to as F for females and M for males plus a number corresponding to what number of male or female respondent they were.

3.5 **Research Protocol**

3.5.1 Summary of Research Protocol

The research protocol is summarised in Table 3.7. The full version submitted for NHS Research & Development Approval and Ethical Approval can be found in

appendix 6. This section contains short overview of the process for collecting the dental professionals' views.

Table 3.7 Summary of Research Protocol

Study Title	The landscape of child protection in dentistry: an investigation
Study Design	Qualitative in-depth exploratory interviews
Study Participants	Dental practitioners, dental nurses and dental hygienists/therapists working in dental primary care in Scotland
Planned Size of Sample	18 to 50 participants
Planned Study Period	September 2015 to May 2017
Research Question	What is involved in the decision by a member of the dental team to refer or not refer a paediatric patient to appropriate services and what influences the decision?

The relevant sample of dental team professionals was identified using the sampling matrix table shown in Table 3.3. The study aimed to recruit 18- 50 dental team professionals with a diverse background in terms of employment status, years of experience, experience of referring, SIMD area of practice, family/ marital status and type of dental team professional in order to try and capture the whole spectrum of views about what is involved in the decision by a member of the dental team to refer a child about whom they have welfare concerns.

Following the recruitment calls for participants sent by email through local dental societies (West and East of Scotland branches of the British Society of Paediatric Dentistry and the Scottish branches of the British Dental Association), via the Scottish Dental Practice Based Research Network (www.sdpbrn.org.uk), by placement of a call for participants on the Call for Participants website (www.callforparticipants.com) as well as invitations sent through social media to dental contacts of the author and local word of mouth, potential participants emailed the author to express their interest. The author checked their eligibility to participate and sent copies of the participant information leaflet and consent forms and asked by email if they wished to participate (appendix). Those who agreed were given options of times, dates and venues for the interviews to take place and the participant chose one the suited best. The author confirmed the

date and time by return email. The day before the interview the author sent a reminder by email.

Only one interview was conducted with each research participant. One the day and time of the interview the author checked that the participant was still willing to proceed, and the consent form was signed by both the participant and the author. A short introduction of the researcher, the study and a brief overview of confidentiality and ethical issues were given before the interview was digitally audio recorded.

3.5.2 Research Protocol Data Management & Analysis

The audio recordings in-depth interviews were transcribed verbatim and thematic analysis carried out to discover answers to the research questions (Chapter 6). This would then be related back to the current thinking and ideas in this field and any similarities or differences discussed. Qualitative methods were employed for the data analysis using an inductive approach employing an emergent framework to group data and then look for relationships. This is discussed in more depth in chapter 6 but involved organisation of the data collected, identification of an explanatory framework, coding of the data plus modification of the framework, initial descriptive analysis of the data followed by second order analysis. Second order analysis was to identify recurrent themes and patterns as well as to identify potential respondent clusters. The data was searched to answer the research questions and allow development of hypotheses. Original audio recordings would be kept for 1 year post PhD viva and the transcriptions kept for 10 years. Personal data would be kept on an encrypted USB stick and paper copies of consent forms kept in a locked filing cabinet in a locked staff office in Glasgow Dental Hospital. To ensure confidentiality of personal data a unique code identifier system for pseudonymisation of the data was used which was not shared with anyone else. No third party had access to this code.

3.5.3 Research Protocol Quality Assurance

As this was a PhD study the scientific quality review was undertaken by the researcher's supervisors and through review by the Glasgow School of Art. A

regular supervision arrangement with the supervisory team was in place as well as annual review and progression events as part of student progress through Glasgow School of Art. At the progression events representatives from the supervisory team as well as NHS Education for Scotland attended.

3.5.4 Research Protocol Expected Outcomes of the Study

It was expected that the study would identify and explain the reasons behind the ever-present gap between the proportions of members of the dental team who suspect abuse/ neglect in their paediatric patients and those who actually refer their suspicions onto appropriate services. As this gap is not exclusive to dental teams and it is an international issue understanding of this gap would create the opportunity for targeted interventions to be developed. As well as having a likely impact on the design of child protection training for dental teams it was expected that these results may influence policy. If the results did identify areas for targeted action this would potentially impact on the health and wellbeing of society as earlier identification of children at risk of or suffering from abuse and neglect paves the way for earlier interventions which reduce long term morbidity and mortality. Some lives could be saved, and some could be improved.

3.5.5 Research Protocol Problems Anticipated

As this study was part of a part time PhD project the timeframe had to be adhered to, but this was often tricky when balancing a clinical profession. The solution to this was careful planning and undertaking of all tasks involved and early identification of any issues that may have set back deadlines. A further problem anticipated was in the recruitment of participants. As this is qualitative research the minimum number of participants that was felt to be adequate to map the landscape as it relates to child protection in dentistry was 18, with a maximum of 50. This seemed to be a reasonable achievable target it was noted that could change if data saturation was reached early.

3.6 **Summary of Methodology**

In-depth qualitative interviews will help to explore what factors are involved and influence the decision by a dental team professional to refer or not refer a

paediatric patient to appropriate services. The interviews also allow a thorough exploration of personal views, opinions and perceptions from the dental professionals themselves who face these situations. In the next chapter reporting the analysis and results from the interviews, the thematic analysis will illuminate the situations that these professionals recalled, and how that relates to what is already known about dental professional's involvement in child protection. From the exploration of the professional's reality, potential areas that might be targeted by a serious game will be explored and data from the interviews will also add to the model of reality to be balanced in the game. The interviews will help to answer Objective 1 (Investigate thoroughly the factors related to referral of child protection concerns by dental teams in Scotland and prioritise them) and Objective 2 (Understand the issues from the perspective of dental team professionals practicing in Scotland).

Chapter 4 Analysis and Findings of In-Depth Interviews

4.1 Analysis of In-depth interviews

There are many different approaches possible to analyse data from qualitative in-depth interviews. As mentioned in chapter 3 our approach was within the philosophical approach of subtle realism. As such the data was treated as giving a view of the participants worlds. The research focused on what the data said, a substantive approach (Ritchie, 2013), rather than on the language or structure of interaction and transcribed text, a structural approach. Analysis was done using an inductive approach as exploration of the data was required to answer our research questions.

We chose a cross-sectional analysis where topics, codes and themes were identified, applied, refined, and compared across the whole data set. This gives a systematic overview of the data and allowed us to compare what different participants were saying. A cross-sectional approach was appropriate to answer the research questions rather than a non-cross-sectional analysis where the topics, codes and themes would have been identified, applied, and refined for each participant individually. This may have given a more holistic understanding of each participants personal circumstances but would not have been appropriate in this study for the specific research questions (Mason, 2017).

The approach was a form of thematic analysis (Braun and Clarke, 2006) and the process followed that of Ritchie (2013) as it attempted to move from data driven descriptions to more abstract themes through abstraction and interpretation by the researcher. Thematic analysis involves discovering, interpreting, and reporting patterns and clusters of meaning within the data. This involved working systematically through the transcripts identifying topics which were progressively integrated into higher-order key themes. Thematic analysis is not tied to any set of theoretical constructs and the process of thematic coding is used in many different analytic traditions.

4.1.1 Overview of Analysis Technique Used

The thematic analysis method used for the in-depth interviews is summarized in Figure 4.1 below. Qualitative methods were employed for the data analysis using an inductive approach with an emergent framework to group data and then to look for relationships. The alternative approach would have been a deductive approach where existing ideas from the literature and the topic guide would have been used to index and sort the data before categorising it. In contrast to this the inductive approach that was taken involved organisation of the data collected, identification of an explanatory framework, coding of the data plus modification of the framework, initial descriptive analysis of the data followed by second order analysis. Second order analysis identified recurrent themes and patterns as well as identifying respondent clusters. Each stage is explained in more detail in the following sections. The data was searched to answer the research questions and allow development of hypotheses.

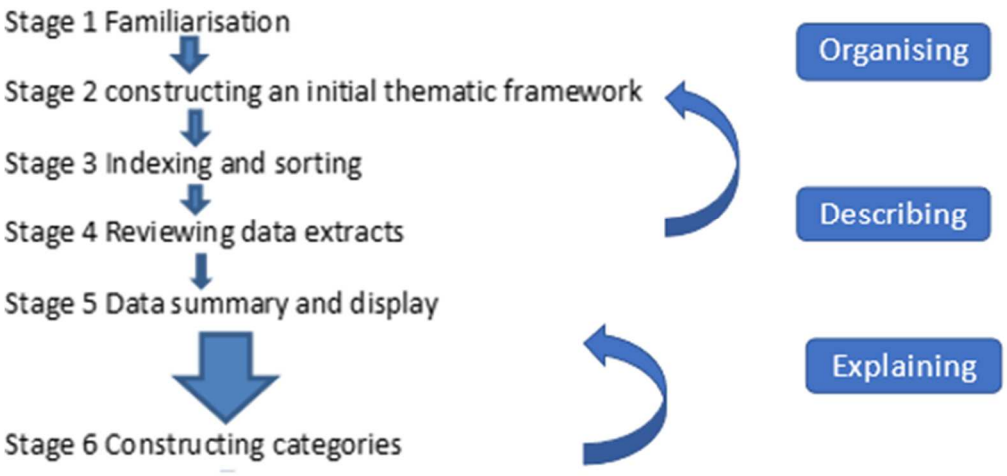


Figure 4.1 Summary of Thematic Analysis Method

4.1.2 Steps in Analysis

4.1.2.1 Stage 1 Familiarisation

All data was overviewed to ensure thorough familiarisation (the transcripts of all interviews were reviewed, and the recordings were listened to). The transcriptions were imported to Nvivo 12 (computer-assisted qualitative data analysis package). Research objectives and questions were revisited, and the

sampling strategy was re-examined (section 4.1.2.2) and compared to the sample achieved. The overall research question for this thesis was “What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?” and this section of results focusses on answering the first part of that question. The eight sub-questions were:

1. What is involved and what influences the decision by a dental team professional to refer or not refer a paediatric patient to appropriate services?

2. What do the terms child protection, child abuse, neglect, welfare concerns, safeguarding and referral mean to dental professionals?

3. How do the dental team professionals pick their continued professional development topics?

4. What training in child protection have the dental team professionals had and what was good or bad about it?

5. How do the dental team professionals feel when they have had cases they were concerned about?

6. What influenced the decisions of members of the dental team professionals?

7. What rules and regulations are members of the dental team professionals aware of?

8. What are the feelings of the dental team professionals towards child protection in a wider sense/ outside of their professional responsibilities?

Topics of interest which were recurrent across data set and relevant to the research question (e.g. Attitudes, behaviours, motivations, views) were identified and made into a preliminary coding list. This list of topics was checked against the topic guide (Appendix 1) to ensure it was comprehensive. Additionally, the relevance of each topic was checked against the main research

aim and objectives as well as the sub-questions. The list of potential topics which was then rationalised and structured into an overall thematic framework (stage 2) in which the items on the preliminary list were grouped together and sorted into different themes and subthemes in an 'initial thematic framework' which can be seen in Appendix 8.

4.1.2.2 Sample Achieved

Eighteen participants were recruited and interviewed during the recruitment period. Recruitment from each Health Board in Scotland is shown in Table 4.1. The participants represented 6 of the 14 Health Boards in Scotland.

Table 4.1 Table of Recruitment Numbers from Each Scottish Health Board

NHS Health Board	Number of Participants Recruited
Ayrshire & Arran	1
Forth Valley	2
Greater Glasgow & Clyde	12
Lanarkshire	1
Lothian	1
Tayside	1
Borders	0
Dumfries & Galloway	0
Fife	0
Grampian	No research and development permission received
Highland	No research and development permission received
Orkney	No research and development permission received
Shetland	No research and development permission received
Western Isles	No research and development permission received

4.1.2.2.1 Comparison to Sampling Framework

The achieved numbers for each selection criteria are shown in red in Table 4.2. In the table red boxes highlight where sampling did not meet the requirements in the sampling frame and blue boxes highlight where the sample was overrepresented compared to the sampling frame. There are some sampling criteria for which no participants were recorded (Participants who referred with less than 5 years qualified, females who referred with 5-15 years qualified, males who have referred with 15+ years qualified, part time workers who have referred, participants who have referred but never had training, participants from wholly private practices, participants who live in the same community in which they work). These limitations in coverage were considered during the interpretation stage of analysis.

Table 4.2 Table of Sample Achieved
Intended sampling matrix numbers are in black text and achieved sample are in red text. Red boxes highlight where sampling did not meet requirements in sampling frame. Blue boxes highlight where sample overrepresented compared to sampling frame.

		Have referred		Never referred		Family/marital status	Small community/large community	Living in same community as work	
		M	F	M	F			yes	no
Less than 5 years qualified		1-3 0	1-3 0	2-4 1	2-4 1	mixture no children	mixture mixture	1-3 0	2-4 2
5-15 yrs qualified		1-3 1	1-3 0	2-4 2	2-4 6	mix mix	mix mix	2-6 0	2-6 9
15 + years qualified		1-3 0	1-3 3	2-5 1	2-5 3	mix mix	mix mix	3-8 0	2-6 7
Employment status	Full time	3-5 3		6-8 8		mix mix	mix mix	mix mix	mix mix
	Part time	1-5 0		6-8 6		mix mix	mix mix	mix mix	mix mix
Child protection training	yes	6-10 4		6-10 13					
	no	6-10 0		6-10 1					
SIMD of practice	SIMD < 3	4-5 2		6-8 13					
	SIMD 4 or 5	1-3 2		6-8 1					
Type of practice	NHS only	4-6 1		4-6 9					
	NHS/ Private	6-8 3		6-8 5					
	Private Only	2-4 0		2-4 0					
Type of dental care professional	dentist	12-40 15							
	other	6-10 3							

Range for total sample 18- 50 participants split between health boards/ regions 18 achieved

4.1.2.3 Stage 2 Constructing an initial thematic framework

After reviewing the list of topics, the initial thematic framework for reviewing the data was constructed (Appendix 8). Underlying ideas/themes that linked items were identified and used to sort them. This produced a hierarchical arrangement of themes and subthemes.

In NVivo the contents of the thematic framework were entered as 'nodes'. These were descriptive rather than abstract and grounded in the data. Along with this a log of higher-level analytic thoughts from the literature was kept (to be introduced later).

4.1.2.4 Stage 3 Indexing and Sorting

The thematic framework was applied to the transcripts of the interviews to locate where topics were being discussed. Each phrase, sentence and paragraph was reviewed to see which part (or parts) of the framework applied. This was carried out in NVivo. Notes were kept of inter connections and links.

Material with similar content or properties was sorted in NVivo using thematic references to bring together all the data that was indexed in the same way. An intense review of the content was then carried out with each topic focused on one at a time to unpack detail and distinctions. This created six main thematic sets namely Culture factors, Decision difficulty, Dental professional factors, Fear of getting it wrong, Referral factors and Training factors with between 4 and 10 subthemes for each main theme. Some of the data was sorted to more than one thematic set. This was the indexing stage of data analysis (Richards and Richards 1994, Seale 1999, Ritchie 2014).

4.1.2.5 Stage 4 Reviewing data extracts

Each thematic set was read to gauge coherence of data extracts. Sections of data that had not been indexed were re-read to see if any important themes were missing from the framework. The uncoded data consisted mainly of the introductory sections of the interviews where the number of years' experience and type of work was discussed as well as clarification questions and answers later in the interview. At this stage some of the uncoded data was then coded to

an existing theme but no new themes were identified that were relevant to our research questions. Some of the uncoded data related to participants discussing safeguarding issues in adult patients which, although interesting and had similar emotions involved, did not address our research questions.

4.1.2.6 Stage 5 Data summary and display

A thematic framework matrix was constructed for each of the 6 main themes. In each matrix each subtheme was allocated a column. The first column was for the case descriptor/ demographic information. Each case had a horizontal row which was in the same location in each matrix. This allowed comparisons to be made on separate parts of the thematic framework at an individual case level as well as across cases.

The data relating to each theme was summarised and cross-checked by reviewing each transcript with regards to the context in which the theme occurred. It was checked that all data had been completely reviewed.

The analytic strategy we used involved the main research question and the 8 sub-questions described earlier. The main research question was regarding what factors affected referral of child protection concerns by dental team professionals and could a serious game provide an effective support for training in this subject? At this early stage it appeared that fear was an important part of the barriers that were described by the participants and so a new research question of “what is the priority barrier to referral that needs to be targeted?” was added to help direct the interpretation of our results. After being immersed in the data it was felt that the sub-questions were too specific for the experiences that the participants discussed, and these were rationalised as shown in Table 4.3 to give a more sensible analytic strategy to answer the overall research question.

Table 4.3 Rationalisation of Research Sub-Questions

Initial sub-questions	Rationalised questions for analytic strategy
1.What is involved and what influences the decision by a dental team professional to refer or not refer a paediatric patient to appropriate services? 2.What do the terms child protection, child abuse, neglect, welfare concerns, safeguarding and referral mean to dental professionals? 3. How do the dental team professionals pick their continued professional development topics? 4. What training in child protection have the dental team professionals had and what was good or bad about it? 5. How do the dental team professionals feel when they have had cases they were concerned about? 6. What influenced the decisions of members of the dental team professionals? 7. What rules and regulations are members of the dental team professionals aware of? 8. What are the feelings of the dental team professionals towards child protection in a wider sense/ outside of their professional responsibilities?	1.What is involved and what influences the decisions of members of the dental team professionals when they have welfare concern about a child? 2. What is the priority barrier to referral that needs to be targeted? 3. What do dental professionals include when they discuss child abuse and neglect and referral? 4. What training in child protection have dental team professionals had and what training do they want? 5. What emotions and feelings are involved when dental professionals have concerns about child abuse or neglect?

4.1.2.7 Stage 6 Constructing categories

The themes and respective subthemes that were felt to be most relevant to the main research question (What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?) and the 5 rationalised questions were focussed on.

All the cases that had been labelled as part of a theme were read through and the range of perceptions, views, and experiences were noted and listed. The

elements present in the responses and the dimensions that differed between them were then listed so that responses about the same thing were grouped together. After reviewing the data not all subthemes were felt to be helpful in answering the questions and those themes that provided information about the barriers to referral or how these could perhaps be addressed were concentrated on.

The subtheme of “Fear of Getting it wrong was relabelled “Fear” as the material was read through and sorted. The elements and the underlying dimensions for the theme of Cultural Factors is shown in Table 4.4. The subtheme of “Fear of Complaints” was taken out of this theme and added to the relabelled theme of “Fear”. The subtheme of “Dental record not following child” was included as part of the “culture of the dental practice”. The subthemes of “Financial factors” and “Hearsay” were both amalgamated into “Effect of Local Area”

The elements and underlying dimensions for the theme of “Fear” are shown in Table 4.5.

The elements and underlaying dimensions for the theme of “Training Factors” are shown in Table 4.6. In this theme the good points and bad points of previous training were included in the “Previous experience of training” subtheme.

The elements and dimensions of the relevant aspect of decision difficulty are shown in Table 4.7. The only subtheme that appeared to be relevant to answering the research question was decision difficulty. The other subthemes of “Straightforward decisions”, “The family involved” and “The type of children that are of concern” did not add further useful information for answering the question and barriers were not noted in these subthemes.

Table 4.4 Culture Factors Elements and Dimensions

Theme	Subtheme	Elements	Underlying Dimension
Culture Factors	Cultural acceptance of caries	Professionals blasé about caries High caries rates normal and common Parents can be ignorant of prevention Professionals quick to judge Professionals have high threshold for caries Families that try but just don't deem to get better	Caries is common Caries is accepted as normal Professionals are unsure when it becomes neglect Families that try but fail with oral health
	Culture of the dental practice	Difficult to keep an eye on disguised non-compliance Being able to talk over concerns helps Some practices chase up missed appointments, others don't, very variable Colleagues with more experience are helpful Making decisions on own is hard Others not interested in helping Having support makes a difference Having a lead for child protection is helpful Patients and families can register with no proof of who they are and can deregister without practice knowing	Availability of support Following up of appointments Ease of registration and deregistration
	Effect of Local Area	Knowing families Chaotic lifestyles of patient cohort Transient populations are challenging Community opinion of practice can be affected by opinion of one family Stories about what has happened to others	Local knowledge Chaotic/transient groups Dentistry is a business

Table 4.5 Fear Elements and Dimensions

Theme	Subtheme	Elements	Dimensions
Fear	Getting it wrong	Have suspicion but maybe a wee bit off the mark Lot of responsibility to make the right call Jumping the gun Messing up somebody's life Wrong judgement Put your foot in it Starting something and dumping a family in it when not actually a problem Caused trouble that's not necessary Be careful of things going too far Brought up all this stuff and you're completely wrong That's not what the case is and got someone into trouble Caused more grief How the parents react Big waste of time Ruined people's lives Jumped to conclusion Don't wanna rock the boat You can not refer and it could be something really important	Causing problems where none exist Missing concerns
	Making things worse	Cause increase in physical abuse Escalating issues Parents doing the best they can and now feel you are suggesting they're poor parents Kids taken away not always for the better Worse state than when they were not with the perfect family Child's going to get taken away Child is going to hate dental professional	Escalation Potential outcomes
	Fear of complaints	Getting into trouble with the boss Don't want a complaint Do anything to avoid a complaint	Avoidance

Table 4.6 Training Factors Elements and Dimensions

Theme	Subtheme	Elements	Dimensions
Training Factors	Availability	Try to do it None on offer	Intention Availability
	Previous experience of training (Good points and bad points sub-subthemes included)	Through LDC Lectures from GP and CPA VT trainer days Lectures Mandatory online training Clinical Governance Lectures with scenarios Invited CP lead who gave examples of dental issues and the bigger picture University undergraduate lectures	Providers of CPD Opportunities Dominated by lectures
	Characteristics of desired training	Scenario based Discussion of cases In-house training Whole practice doing it together Effective in a couple of hours Not too expensive Face to face Learning from mistakes Something similar to BLS training	Method of training Team involvement Value for money Efficient
	Choosing CPD topics	Love doing CPD Nice break from practice Prefer hands on Whatever the health board offers From NES website Core CPD subjects Interest or availability Time lapse since last learned about subject Mandatory subjects Topics chosen already as part of VT What is affordable What will generate income	Enjoyment Preferences Availability Core/ mandatory topics Assigned topics Affordability Potential income generation

Table 4.7 Decision Difficulty Element and Dimensions

Theme	Subtheme	Elements	Dimensions
Decision Difficulty	Difficult Decisions	Feeling parent might not be coping terribly well Kids that just look unkempt When you know the whole family but can only discuss with parents Not necessarily abuse but not being looked after Nuances of neglect Eating lots of sugar and chaotic lifestyles resulting in missed appointments Not coming back for restorations Gross caries in a 3-year-old Needing to see the bigger picture The lower end of just concerns Failing GA assessments then coming in with new cavities Neglect through lack of knowledge Trying to make a judgement call on parenting Seeing a snapshot of a mum at the end of her tether Do you trust your opinion on gut instinct? Dental neglect in otherwise happy child Parents who can't control a child's diet When children are older and more responsible for themselves	Judgment calls Snapshot in time Attendance pattern Dental neglect difficult

The elements and dimensions noted in the theme of "Dental Professional Factors" are shown in Table 4.8. The subthemes of "Approach to care", "Background of the dental professional", "Confidence", "Instinct", "Personality"

and "Wider inputs to the dental professional" did not seem to add relevant information about barriers to referral or be involved in the decision to refer.

Table 4.8 Dental Professional Factors Elements and Dimensions

Theme	Subtheme	Elements	Dimensions
Dental Professional factors	Experience	Not enough experience No experience of reporting Previous experience of working with children Having own children Not having own children Early in career and perhaps over suspicious Positive experiences of referral	Varied background experience
	Feeling and emotions involved	hugely anxious guilty not entirely comfortable bad and under prepared worried uncomfortable awkward sorry for parents nervous frustrating frightened depressed lot of responsibility heart cringey icky scared really sad so guilty awful really anxious stressed bit rubbish uneasy helpless wee bit concerned strange Better at having done it happy that passed the buck relieved happier fine rewarded	Negative feelings bringing up suspicions or referring Positive feelings after its done

The elements and dimensions in the Theme of "Referral Factors" is shown in Table 4.9. The subtheme of "Problems surrounding what is meant and understood by referral" was not reported as it did not appear to add to the evidence surrounding factors affecting referral.

Table 4.9 Referral Factors Elements and Dimensions

Theme	Subtheme	Elements	Dimensions
Referral factors	Lack of feedback	Social services spoke to family, and we haven't seen child since Don't know what happened Never came back Patient goes somewhere else Not knowing what happened Never saw them again Never get any feedback Don't know the outcome Wanting to know the child is safe Was the referral received? No contact Not knowing if you helped	Unknown outcomes

	Previous experience of referral	Not particularly well received Hard to get in contact Lots of time chasing Bounced round the whole office Quite positive Wouldn't put me off They takeover	Variable experiences of referring
	Time	Time to chase missed appointments Hard to get time to phone at right time to speak to social worker on case Making a judgement in 5 minutes Time not a factor if you really do have a concern Loads of patients Snapshot Patients are in and out Can't treat other patients while dealing with concern Time between other patient doing phone calls and writing notes Quite lengthy process Time intense Busy appointment book At least 2 hours for one child Not enough time to recognise things or collect info 2 to 3 hours work every time Not against spending as much time as necessary	Limited contact time Time pressure

After identifying the underlying dimensions in the themes and subthemes the data was examined again and the elements combined into different types of responses to give a set of categories that discriminated between different manifestations of the data. The framework columns were worked down systematically check if each piece of data in the framework was a characteristic or component of an established category or if it gave a new category.

Several iterations of this process were completed in an attempt to resolve 'double listing' of elements. The categories were then cross referenced with the data. Some double listing did remain due to the richness and complexity of the data. We endeavoured to retain the connection between the original data and categories, so the process was transparent.

4.2 **Results of In-Depth Interview Study**

4.2.1 Thematic Analysis

The categories were descriptive and stayed close to the content of the data as the study was to inform the model of reality (Harteveld, 2010). They are shown in

Table 4.10.

Table 4.10 Themes, Subthemes and Categories from In-Depth Interviews

Theme	Subtheme	Categorisation
Culture Factors	Cultural acceptance of caries	Professional acceptance of caries as normal and common Families that appear to try but don't improve are accepted
	Culture of the dental practice	Importance of the team Variability in following up of missed or cancelled appointments Patient records don't follow patient
	Effect of Local Area	Local knowledge can affect decision making Local communities with chaotic or transient lifestyles affect decision making Impact on the practice can affect decision making
Fear	Getting it wrong	Fear of causing problems for families when nothing untoward is going on Fear of missing cases
	Making things worse	Fear that you aren't helping and are in fact making things worse for the child or their family
	Fear of complaints	Fearful of receiving complaints from families
Training Factors	Availability	Desire for child protection training but not available
	Previous experience of training	Varied experiences of child protection training Previous training dominated by lectures
	Characteristics of desired training	Active methods of training are desired Team involvement desired for training Desire for training to be done in the practice itself
	Choosing CPD topics	Dental team professionals choose CPD topics based on enjoyment, preferences, availability, core/ mandatory topics, assigned topics, affordability, and potential income generation
Decision Difficulty	Difficult Decisions	Decisions that are difficult often involve deciding when multiple carious cavities become dental neglect and whether this is enough on its own to refer a patient.
Dental professional Factors	Experience	Dental professionals have varied experiences which can help and hinder referrals
	Feeling and emotions involved	Negative feelings such as fear, anxiety, guilt discomfort and unease associated with having suspicions and making referrals Dental professionals feel happier when suspicions have been passed on and rewarded when a good outcome is achieved.
Referral Factors	Lack of feedback	Not receiving feedback leaves dental professionals wondering what happened and if they helped or did the right thing
	Previous experience of referral	Positive experiences of referral help dental professionals feel happier to do it again Negative experiences involve the time it takes, difficulty in contacting the correct people and when the referral isn't well received
	Time	Appointments are very short 5-15 mins and only allow a snapshot of the situation, makes referral decisions difficult Time pressure of a busy practice means it is a struggle to fit referring patients of concern around other patients.

4.2.1.1 Theme 1 Cultural Factors

The subtheme of Cultural acceptance of caries had 2 main categories the first of these being "Professional acceptance of caries as normal and common". Participants repeatedly discussed being so used to seeing caries and dealing with it that it just felt normal to them and not a concerning problem.

> "We're so blasé now about caries because we see so much of it and it's kind of, sadly in the West of Scotland, the norm for kids to come out, come in with multiple caries and then come and get the urgent thing dealt with and then not be brought back again for another year."

The second category in this theme was that "Families that appear to try but don't improve are accepted", meaning that in these situations the participants appear to give them the benefit of the doubt even though they might feel some part of it is neglectful.

> "And I guess it still technically falls under some form of neglect in that it tends to be that also their oral hygiene's terrible but they're kind of trying and… I would find that more difficult to consider reporting as such because you think "what am I reporting that they come to the dentist and they just don't brush their teeth?" Well I could report all my patients there couldn't I?"

4.2.1.2 Theme 2 Fear

The theme of fear, although a separate theme, also pervaded some of the Dental Professional Factors theme where emotions were discussed and the Referral factors theme where lack of feedback left participants fearful about outcomes, but it also had three significant subthemes itself. Participants discussed Fears of getting it wrong, meaning that they were fearful of making referrals because they worried that nothing was, in fact, going on that would be considered as abuse or neglect but they would have started a chain of events they then couldn't stop, and they always assumed this would result in negative outcomes for families.

> "That you know did I do the right thing or was I completely, way off the mark and I have ruined people, people's lives?"

An alternative view was that despite being concerned about causing problems getting it wrong could mean not referring a case where a child needed help or protection.

> "but when it's small minor concerns which could add up to something bigger, I think it's just, you don't really know what you should do, you don't want to rock the boat, you don't wanna get someone in trouble in case you're really getting the wrong end of the stick. And I'm fully aware that you can, you can not and it could be something that's really important".

Another fear that was discussed was "Fear that you aren't helping and are in fact making things worse for the child or their family". Participants wanted to do something to help, and their referral was intended in the child's best interest but they worried it could actually make things worse and perhaps cause more harm to the child or family either because they are doing ok or because of concerns about escalation in violence.

"I don't know just lots of visits and they feel like you're suggesting that they're poor parents and not doing well for their child when they're maybe doing as well as they can."

> "…say I thought that child was getting physically abused and I then discussed it with the parent, and they go home in an absolutely foul mood and they take it out on the kid. That, that really frightens me to be honest with you that notion that it could be, say, say I had a kid in for a check -up and they're in by themselves and they start talking to me and saying something about dad hitting them or whatever, and I have a discussion with dad, then my worry is that they go home and it's like "you shouldn't have told that woman that blah, blah, blah" and things can escalate and that's definitely a big concern. Fortunately, I've never seen someone who I do think, you know, I've never, that's never come up but it could do and I would definitely be really, I would be really anxious then about discussing it with the parent. And also, you think actually if you are discussing that with someone who is violent in the first place, you know, what could end up happening for your safety, for the rest of the practice's safety but at the end of the day first concern is about the little kid. But I don't want to make their situation worse, and I don't, I don't know what the right thing is because then do you just phone social services and they swoop down one day unannounced? I don't know, cause these poor kids are obviously then in a really volatile situation regardless of what happens."

Participants were also fearful of receiving complaints from families and how their employers would react to that.

> "Maybe even getting into trouble with the boss if they don't own the practice then, em, a patient's parent if they bring something up they can make a complaint and I think another thing would be, for the last question you asked, I think complaint is a big one actually as well."

> "Cause I think dentists are very scared that, from my experience since starting, watching the associates, they are so scared to do anything, em, they're really, really scared, I mean not even just children, but adult patients they will do stuff for free just so that they don't get a complaint. Em, and if basically whatever the patient said they'll do almost, em, to avoid a complaint, they will do anything to do that so if not speaking about something like that is going to avoid a complaint, they will probably do it, I think that's a big thing, and I don't think the NHS help that".

4.2.1.3 Theme 3 Decision Difficulty

There was repeated discussion that the decisions that are difficult often involve deciding when multiple carious cavities become dental neglect and whether this is enough on its own to refer a patient if there are no other concerns.

> "And then the one I always find difficult is the dental neglect because that is, that is definitely a child protection issue in my mind but we see so much of it and we would see so much of it during my training as, you know, in the public dental service and things and referrals weren't being made all the time to child protection so I find that a difficult decision and I haven't ever phoned about that"

> "There's a lot, there was one kid, another one, I didn't report this child, rampant caries, father owned a sweet shop and he would bring her back in, only in pain, and I was thinking this is child neglect, but how can I turn round and say "this child is on it's third GA, you are feeding this child sweeties" and his excuse was "oh well they're in the shop, she just helps herself". He had no control over this kid, it was awful! And you think well, do I report him for neglect of his daughter? Who was four or five and the time and you know, well, everything done."

4.2.1.4 Theme 4 Dental Professional Factors

In this theme the participants discussed their various experiences which could help or hinder referrals. When participants discussed cases when they were newly qualified or hadn't treated children for a while, they felt their lack of

experience was partly what had led them to have trouble making a decision to refer.

> "I just didn't have enough experience and didn't know enough about what to do at that point."

> "Em, in the Forces I didn't treat any kids for six years, no I did for maybe 2 months when I worked abroad and that was it! So I knew nothing about treating kids"

Others with more experience felt this helped them and were very involved in dealing with child protection concerns in their workplaces.

> "I'm kind of the child protection lead if you like for the practices. Emm and we're involved in a lot of early intervention work, em and we're piloting a, a kind of early intervention program within the practice just now"

When discussing the feeling and emotions involved in having suspicions and acting on them the vast majority discussed negative feelings such as fear, anxiety, guilt discomfort and unease.

> "hugely anxious, hugely anxious"

> "I remember how stressed she was about that. Em, and you think, like, it's a scary thought to think that you'll maybe have to stand up and give that sort of opinion"

> "I didn't feel entirely comfortable telling on them because it was a suspicion rather than something that was very obvious."

> "Very worried and very guilty feeling. Guilty that I wasn't doing enough, because I, I, well, the first 2 in my own practice when it was kinda down to me, em, and I thought, you know I feel guilty"

In contrast after having made a referral participants reported feeling happier and relieved which shows how much of a weight it had been for them. They also discuss the change in feelings that they experience.

> "Em, Ok I felt better having made the…[referral]"

> "I was quite upset, I was quite angry actually at first because I was like "I don't understand why if your kids in pain or has a swelling why they're not being brought in", em, obviously she cares enough to

make the appointment so why not care enough to bring her in? Em, and then I did feel quite sorry for the mum because I did feel like, ok she does have, like, issues going on and it must be quite difficult for her looking after a kid when she's got no partner to help her. Em, but the I felt, kind of, rewarded almost, when, and appreciated that she had listened to me and she started to bring her in and she would actually in her in, she wouldn't bring someone else, and she'd come in without fail with her daughter so it was nice to see that in the end."

4.2.1.5 Theme 5 Referral Factors

Participants how much of a factor the lack of feedback about cases they had concerns about was. Not receiving any feedback left the dental professionals wondering what happened and they didn't know if they helped or done the right thing, there was no closure for them.

"Em, so I don't know what happened to her…….There's no adult there, there's no way of really chasing it up and I never saw her again. She never came back to me, no."

"You know I phoned up and spoke to them and they went "right ok" and that was it. Phone went down and I never heard a thing or saw the kid, or the Granny again. So I don't know."

"Em I don't know any outcome of the case or anything like that. There was no contact made with me about it at all……..And I also don't know if I was any help to her at the time. Strange situation, but"

For those who reported previous experience of referral positive experiences of referral helped dental professionals feel happier to do it again whereas negative experiences were also reported involving the time it took, difficulty in contacting the correct people and when the referral isn't well received.

"Em the experience of the other dentist with that one patient has been quite positive in that the mum knew that we were going to talk to, em, talk to someone who was going to try to help her, to facilitate bringing her in, em, bringing the children in and I think there's a willingness amongst the authorities to assist in bringing the children in to get their treatment, or at least find out why they've missed appointments"

"No, not really no. So it didn't go particularly well I didn't feel which made me probably more wary of actually contacting them, cause I thought it would be quite a simple process and it turned out that it wasn't. I was just difficult to get a hold of them when we wanted to."

> "he was really very kind and agreed to sort of look into it for me and then between us we managed to work out why the, because I think he'd been sent a few appointments and hadn't come, but then it turned out and transpired and we had the wrong, the practice, it wasn't our fault because they hadn't inf, we had the wrong number and the wrong address, em, so I think in the end the father actually made contact with us and then we were managed, managed to get the right address and the right phone number and then [the PDS dentist] saw them"

The amount of time involved in dealing with child protection concerns was noted to be a barrier. The dental team professionals' appointments were very short (5-15 mins), and participants felt they only allow a snapshot of the situation which makes referral decisions difficult. They also explained the time pressure of a busy practice means it is a struggle to fit referring patients of concern around other patients.

> "I think the time factor, em, like you see an awful lot of patients. You have ridiculous number of patients, em, and, em, if you see 35 a day and you're very booked and one misses or one you have a thought like that, I mean I don't see any neglect as in anybody's had any, I don't think anybody's been abused in any way physically, it would just be missed appointments or they have decay and they're not, their parents aren't looking after them like brushing their teeth wise, like, so it's not, there's just not time to actually think like "what is, what will I do, is there time to phone?" Like with [my VT] phoning it was hard to get the time to phone at the right time. Em, in between patients and then they phone back and you're with someone and do you leave then and then speak to someone on the phone? Yeah it's, it's just time."

> "[Appointments are] about 5 or 10 minutes. It's not long, especially if it's a family, which most of them are. You kind of book a 20 minute slot and you've got like parents to see and children to see so you don't have a lot of time to do that."

> "But the one with, the recent one, was very frustrating cause I had to spend a lot of time chasing it up, a lot of time, you know, in between patients making phonecalls, finding out, a lot of time writing up notes and things like that, so it was quite frustrating in that aspect. It was one of these things that maybe took me a couple of weeks to actually phone because I was like "I've still not managed to have a chance to phone these people!"."

> "Em, time is a major thing because it's always, you try and, if you're not willing to just think "right ok, cut!" Not seeing anybody, cancel my day, if you're not willing to do that then it's always ay five o'clock at night, or half past five or six or whenever you finish, or during your

> lunchtime, or somewhere like that you're trying to get it done and you want to get it.. decant all the information and get somebody saying "right I've got this I'm going to run with it now!" As opposed to "yeah, yeah, yeah I'll put it in the pile!" Which I think is a lot of the problems. You phone social work and (deep breath in and loud exhale) jee whizz, you know, you're lucky if they're actually answering the phones "oh yeah, oh that, that caseworker's not here", "well I need someone to deal with this now" you know."

4.2.1.6 Theme 6 Training Factors

This theme was particularly relevant to the second part of the main research question namely "can a serious game provide an effective support for training in this subject?" In order to provide an effective support, it should, ideally, have some of the desired features of training that are lacking for dental team professionals at the moment.

In the interviews participants discussed lack of availability for child protection training.

> "I think that would be really useful I mean there's really no, um, no child protection courses on the CPD that NES offer. Em and I tried to get one."

There was varied previous experiences of child protection training mainly dominated by lectures.

> "Mostly lectures, well those 2 were lectures, and then we could ask questions or discuss if need be."

They were keen to discuss what they wanted to see in future desired training. They persistently reported that they wanted active methods of training with team involvement and for it to be done in the practice itself.

> "With regards to child protection what I'd really like, is, like you've had in house decontamination training, and in house radiology training and in house C, eh, child protection would be really helpful because what tends to happen is all the staff go on the courses but everyone's just going on something one person and what we try and do is get them to then come back and have a quick chat at a practice meeting if there's anything we should be doing differently. But actually, for child protection we need the whole practice doing it together so that we have a kind of, everyone singing from the same sheet, you know. But I don't know if NES are looking to do something like that at some

> point. But you know they, I don't know if you know, they do have like a list of things where someone will come out to the practice and do that and it's a much more constructive way to do it because actually it gets everyone doing CPD at the same time, for the same subject, so we're all doing the same thing, emm, its really cost effective for me as a practice owner because its one charge rather than paying 17 people's charges. And, em, I think it's just much more valuable when you're doing it as your team in your own environment as to what, what are we doing to do here as opposed to someone just sitting in a lecture, one person sitting in a lecture and coming back and saying "well actually". Cause even though I find that really interesting you're now asking exactly what was involved in it and what happened and I'm kind of like, emm, I can't really remember a lot of it. It was useful but I don't have anything specific. And when you send one nurse away on a course and then four weeks later at a practice meeting ask them "is there anything that you would do differently" and they're like "auch no, it's all, yeah everything's fine". And , so it kinda doesn't get us any further down the line of child protection training of having a cohesive plan really."

> "I think the idea of full practice training is really useful though. I think that for dental practitioners is much more valid than a postgraduate course that people, that one person from the practice goes on, I think having in house training, em, and it doesn't have to be hours long, you know, just something that, you know, you could do something really effective in a couple of hours, em, I think that would make a huge difference."

A summary table of characteristics of desired training is shown in Table 4.11.

Table 4.11 Characteristics of Desired Training

Desired Characteristics of Training
Team based
In practice
Efficient/ effective in a couple of hours
Scenario based
Discussion of cases
Not too expensive
Face to face
Something like BLS training
Learning from mistakes

The dental team professionals interviewed discussed how they chose their CPD topics and reported it based on enjoyment, preferences, availability, core/

mandatory topics, assigned topics, affordability, and potential income generation.

> "It's usually more just an interest. I mean obviously there's the ones that you have to do like the radiology and all that, I don't really want to do them but you have to do them, but, for instance I like restorative things so I'll go with a restorative one or if I feel like I'm lacking in a particular, more of a hands on skill rather than a , something like child protection for instance, where I feel like I don't know an awful lot about it but I might think I prefer to something practically so that wee bit more interesting."

> "Orthodontics, white fillings these are things that you, people think "oh well I'll go to that because I might learn something that's going to generate me income" whereas child protection's going to not generate them income, it's going to generate then a headache if they think about it. And I think that is the biggest barrier to the whole thing. General practitioners tend to think about money."

4.2.2 Answers to sub questions

1.What is involved and what influences the decisions of members of the dental team professionals when they have welfare concern about a child?

The participants reported problems with making difficult decisions as well as lots of negative emotions with fear being a very strong theme. Cultural factors influenced their decisions as well as their own experience, previous experience of referral and time pressure.

2. What is the priority barrier to referral that needs to be targeted?

The theme of fear was such a strong, recurrent theme in the interviews that it appears to be the priority barrier to be targeted.

3. What do dental professionals include when they discuss child abuse and neglect and referral?

In the interviews they discussed the types of children they were concerned about and their previous experiences of referring or having concerns and not referring.

4. What training in child protection have dental team professionals had and what training do they want?

Previous training in child protection was very variable but they were keen for future training to be active, to be done in practice with all their team members and to be effective and efficient.

5. What emotions and feelings are involved when dental professionals have concerns about child abuse or neglect?

Mainly negative emotions are reported when they have concerns, with fear being an overwhelming recurrent theme. They do feel better after having referred but are often left without knowing the outcome of a case meaning they must deal with uncertainty.

4.2.3 Answer to overall research question

"What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?"

The factors that affect referral are factors related to culture, the dental practitioner themselves, training factors, referral factors, the decision difficulty and overwhelmingly fear. It will be discussed in the next chapters how a serious game could support effective training in the subject.

The interview data and the literature have created the model of reality for dental professionals dealing with concerns about CAN. The areas that could potentially be targeted by a serious game intervention are summarised in Table 4.12.

Table 4.12 Potential Areas to Target with a Serious Game

Potential areas to target with a serious game
Dealing with uncertainty
Tackling Fear
Making difficult decisions
Providing experience to those who have none

4.2.4 Discussion of Results in Context

When compared to the literature on the factors that affect referral the top UK barrier to referral appears to be lack of certainty of the diagnosis although fear of family violence to the child is also a frequently reported barrier (Cairns et al., 2005, Harris et al., 2013, Clarke et al., 2019). Other suggested factors in these papers which influenced the decision to refer are: concerns of impact on the practice, fear of violence to the GDP, fear of litigation, fear of consequences to the child from statutory agencies and lack of knowledge of referral. In summary the two main issues appear to be fear (of potential outcomes) and confidence (in how to refer and lack of confidence in diagnosis). The interviews in this research have shown that the overarching theme of fear appears to be extremely important. Lack of knowledge was not a main theme at all, and neither was confidence, however participants did discuss what decisions were difficult to make. Internationally the top barrier to referral is uncertainty of the diagnosis as well as types of fear (Crowley et al., 2019, Bjorknes et al., 2019, Rønneberg et al., 2019, Uldum et al., 2010, Jakobsen et al., 2019, Laud et al., 2013, Cukovic-Bagic et al., 2015, Kural et al., 2020, Özgür et al., 2020, Drigeard et al., 2012). It appears that this study agrees with the literature in that fear is a huge problem. This research explored what made the decisions to refer difficult rather than whether uncertainty is an issue, and this has perhaps been more enlightening rather than simply asking respondents whether being uncertain is a barrier to referral. This study explored that more deeply by asking what makes decisions difficult.

4.2.5 General Discussion

Due to the qualitative nature of the data from the interviews no attempt to draw conclusions about the prevalence of various views that dental team members have towards child protection were made but a representational generalisation has been made that the categorisation of views found reflect the range of views held by dental team members. As the issue of not referring all suspected cases is not exclusive to dental team members, it can be inferred that the elicited views/ barriers/themes may also be relevant for other healthcare

workers. Finally, the theoretical generalisations may inform higher order theory about decision making in health professionals. As this is an academic piece of work the theoretical generalisations show how these findings fit within the larger body of theory surrounding child protection and the dental team.

Qualitative research cannot be generalised on a statistical basis (samples are purposive and not probabilistic) and so the value is in showcasing the breadth and nature of child protection in dentistry. The results do not show frequencies of responses but map ranges of responses. It maps the range of views and experiences and the factors and circumstances that influence them, and this is what can be generalised to the wider population. Although individual variants would, of course, be found within the wider population representational generalisation requires that these can still be categorised within the conceptual framework derived by this study. As the sample is purposive and not probabilistic if another sample were drawn the frequencies of responses would be likely to be different but they should all fit in the range of themes. Assessing the representational generalisation depends on the accuracy with which the phenomena were captured and interpreted (and so depends in turn on quality of fieldwork, analysis and interpretation) and on the degree to which the sample is a symbolic representation by including the diversity of dimensions and constituencies that are central to explanation.

For inferential generalisation modest speculations on the likely applications of the findings to other situations must be logical, thoughtful and problem-orientated rather than statistical or probabilistic.

4.2.5.1 Reliability of results

Reliability of the findings depends on the likely recurrence of key features of the raw data and the integrity with which they have been classified.

4.2.5.2 Validity of results

Validity in thematic analysis has 3 components namely measurement validity, internal validity, and external validity.

Measurement validity relates to the degree to which the measurements used capture the concepts they are intended to capture. This research aimed to exhibit excellent, well-grounded links between the concepts and conclusions developed and the examples drawn from the data from which they have been derived. This is one of the key strengths of qualitative data which is its ability to describe a phenomenon in rich and authentic detail reflecting the language and meanings assigned by participants.

Internal validity is the extent to which causal statements are supported by the study. Textual commentary of the findings gives evidence of the range of views and experiences and evidence of meanings and definitions as ascribed by the participants. Evidence included the quotes chosen to illustrate and amplify themes and concepts developed through analysis, and figures and tables to illustrate the processes that were used. The audit trail of analysis ensured the quotes chosen were not just the most beneficial to the research. The analysis audit trail has been described in the first part of this chapter results. It included initial indexing, initial thematic framework, framework analysis, and construction of categories.

External validity is the extent to which the study's findings can be generalised to a population or other settings. In generalising this study it is the range of responses to the interview questions and the emergent themes which are generalisable rather than frequencies of responses.

Validation through theory triangulation is shown through resituating the findings within the existing body of knowledge. Respondent validation could have been possible through sharing of findings with participants but due to time limitations this was not possible, it could, however, be considered for future work.

4.3 **Conclusion**

The main themes regarding factors that affected referral in these interviews were factors related to culture, the dental practitioner themselves, training factors, referral factors, the decision difficulty and overwhelmingly fear. This has fed into the model of reality and also given ideas of what the desired

training to address these factors could be which can be incorporated into the serious game intervention.

Chapter 5 Chapter 5 Design of Serious Game

5.1 Introduction

From the discussion of current literature in Chapter 2 and the results of the in-depth interviews in Chapter 4 we have established an informed model of reality for the Triadic Game Design Approach (Harteveld, 2010) and identified aspects of the real world towards a potential serious game intervention. The model of reality is about deeply understanding the reality of a situation, problem, or practice and hence the in-depth interviews reported in Chapter 4 complemented our thorough literature review (Chapter 2). Now we move onto the model of meaning which aims to determine the nature of our serious game intervention. This chapter addresses objective 4 of this research (Section 1.3.4) which is to investigate and develop a serious game approach to support the delivery of teaching and training in child protection/ safeguarding to dental professionals based on the evidence gathered in objective 1 (investigate thoroughly the factors related to referral of child protection concerns by dental teams in Scotland and prioritise them). Table 5.1 summarises the areas that could potentially be targeted by a serious game intervention.

Table 5.1 Areas that could be targeted by a serious game intervention

Potential areas to target with a serious game
Dealing with uncertainty
Tackling Fear
Making difficult decisions
Providing experience to those who have none

The key section consideration for this chapter was Harteveld's world of meaning. Meaning is about identifying the area of intervention and determining the learning objectives of the serious game. Harteveld (2010) describes the world of meaning as creating a value proposal for the game. He explains that there are values that are aimed at the player (knowledge, skills, and attitudes) and there are other values such as assessment, data collection, theory testing and exploration of topics. Meaning focuses on the type of value that is needed and considers this from various disciplines and criteria. The criteria part of the world of meaning concerns such criteria as "motivation," "relevance," and "transfer" (Harteveld, 2010).). For a serious game intervention in the subject area of child

protection and dentistry a game could be designed to improve or change knowledge, skills, and attitudes or provide a contextualised exploration of the topic.

As Harteveld (2010) points out the world of meaning needs to be brought together with the world of reality as "without Reality there is nothing to base a game on and apply the eventual meaning to" (Harteveld, 2010). For this serious game intervention, it was important to include aspects of time pressure, patient satisfaction levels and stress levels of the characters as these were important themes which recurred in Chapters 2 and 4. As fear was an important theme in the interviews (Chapter 4) and the literature (Chapter 2) it was necessary to find a way of bringing the ability to cope with, or challenge, fear into the game. Also, aspects of the individual characters, the patients and the scenarios were rooted in the world of reality.

A table listing potential desirable criteria for the serious game intervention, the potential skills that could be taught/acquired and the reasons behind these was constructed (Table 5.2).

Table 5.2 Table of Criteria and Skills for Potential Serious Game Intervention

Criteria (the game will be or have.)	Why?
Collaborative	Overwhelming theme from interviews was that training is better if done as a team, especially the team that works together day in, day out
There are consequences for getting it right or getting it wrong- decisions have consequences	Strong theme from interviews regarding worries about getting things right or wrong. The game needs to build causality in its articulation.
Time pressure	Theme of feeling that time can be an issue in practice
The group of players playing could perhaps get better at the game as they play but if one player changes/ novice introduced this would affect how the game goes	There is a feeling that the more you are involved in child protection the better you get at it, but if one person you are used to dealing with changes you may have to compensate/pick up slack
Each player to have a different role	Theme of the importance of team here, plus also experiencing other roles
Ability of players to build up resources (skills, cards??) that help negate when things go wrong	This is bringing in the idea that if the practice has policies and procedures in place and everyone knows their roles then it is easier to handle difficult situations.

Something in the game to reflect that sometimes subjects (patients) move around, and you might know lots about one family but nothing about the next	Theme from interviews was that decision making can be affected by how well a team know their patients
Game can be played in 45 mins- 1 hour	Can be played during a lunch break or as part of a study morning/afternoon
Elements of simulation and response	Payers can safely experience what will happen if they do the "wrong thing"
Encourages knowledge exchange throughout the game	People with more experience can offer advice / support/ or a different point of view or war stories.
Skills that could be taught/ acquired	**Why?**
Decision making under time pressure	Theme from interviews that time pressure makes decision more difficult
Breaking bad news/ telling bad news to others	Theme of not wanting to report/refer because they have to tell the family and assume this will always be a bad thing
Dealing with/ coping with/ managing adverse reaction / consequences. (Resilience?)	Themes of concerns about things that might potentially happen (but have never experienced themselves). Target this by living it safely in the game, including elements of plans for if these things happen
Policy and procedure knowledge	This is an important element related to decision making and should be present in the game as a better knowledge of procedures allow for a more considerate and accurate decision making
Communication skills	Communication with non-dentists seems to be problematic

Considering our lack of computer game design experience and equipment available the resulting serious game intervention should be playable in sites without computer availability, the decision was made to design a board game. In the timescale, and in terms of computing skills it was not feasible for the author to design a computer game. The aim was to make a game that could be played by dental team professionals as well as dental students so that it could be used in both undergraduate teaching as well as continue professional development for dental team professionals (Objective 4 Section 1.3.4 of Chapter 1).

A serious game must be focused to be effective and as such, some aspects of the research in chapters 2 and 4 would not be covered by or play a significant part in the game due to the strong focus required for the elements of fear and time pressure. From the initial list of desirable criteria (Table 5.2) it was considered and discussed how these elements could be combined and how useful or

enjoyable they would be in the game. The elements that were not directly included were that the game does not teach breaking bad news skills and does not seek to teach policy. How to break bad news certainly could have been a focus for the serious game intervention but as fear was a stronger theme it seemed more important for that to be the focus. Although knowledge of policy is important the discussion in Chapter 2 (Section 2.2.2) suggested this was not one of the top barriers. Additionally, although policy was not planned to be taught in the game elements of procedure were. The one other element that was not planned to be directly taught in the game was communication skills with non-dentists although the players would be communicating with each other.

5.2 **Remit of serious game intervention**

The starting point was the overarching theme of fear which was very strong in the interviews (Chapter 4) and a recurrent theme in the literature review (Chapter 2, section 2.2.5). We aimed to design a game that would address some of the fears that dental team professionals have about referring suspected cases of CAN.

In designing the serious game intervention, the purpose of the game was threefold, namely to:

1. Put child protection into the context of the working day of a dental practice to facilitate reflection on previous experiences and attitudes thereby influencing future choices.

2. Highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making.

3. Introduce the game players to ways of coping with or managing the personality traits or elements of disordered or unhelpful thinking that they may have in common with the game characters, so that they can use this in their future professional decisions and lives.

Fear in dentistry is commonly written about, but usually from the perspective of patients experiencing dental fear and anxiety. Cognitive behaviour therapy is a

leading model in the literature regarding the management of dental fear and anxiety. In researching this method, it seemed to be the most appropriate model for addressing the fears that were evident in the results of the in-depth interviews. Cognitive behaviour therapy (CBT) is a psycho-educational form of psychotherapy. In clinical settings, such as the dental setting, its purpose is:

> "for patients to learn new skills of self-management that they will then put into practice in everyday life. It adopts a collaborative stance that encourages patients to work on changing how they feel by putting into practice what they have learned."(Williams and Garland, 2002a).

There is local expertise on CBD within the University of Glasgow as Professor Chris Williams (Director Five Areas Ltd and Emeritus Professor of Psychosocial Psychiatry University of Glasgow) is a leading developer of CBT resources and past-President of the lead body for CBT in the UK and the ideas for including CBT in the serious game intervention were discussed with Prof Williams by telephone and email and he agreed this would be a good approach to addressing some of the underlying fears dental team professionals have in referring suspected cases of CAN.

In the board game the characters (various dentists) have characteristics of the "unhelpful thinking styles" discussed in Prof Williams publications (Williams and Garland, 2002b, Williams, 2001) that make it more difficult for the characters to make certain decisions (for example to refer a child regarding concerns about neglect). One interesting aspect of the game is that it might not be their character they share personality traits or thinking styles with but potentially another player character, thus distributing/covering a wider range of traits, fears, anxieties, and unhelpful thinking styles within the playing party. These unhelpful thinking styles as discussed by Williams and Garland (2002b), Williams (2001) include bias against self (own worst critic), negative slant on things ("focus on the bad stuff"), catastrophising (jumping to the worst conclusions), gloomy view of the future), negative view about how others see you (mind reading), bearing all responsibility (taking responsibility for everything including things out with your control) and making extreme statements (saying things like "should" and "got to" and setting impossibly high standards for yourself). In the game participants can pick up "resources" some of which are tagged to the

unhelpful thinking styles (for example a resource might introduce the concept of thought investigation and challenging unhelpful thoughts and feelings). The game was designed so that the player doesn't actually "do" the work in the game but picking up such resources negates the effects their "unhelpful thinking styles" have on their ability to perform tasks in the game. The “unhelpful thinking styles” were used with permission from Five Areas ltd (www.llttf.com/dental) royalty free for noncommercial use in the U.K. following consultation with Prof Williams.

5.2.1 Key Learning Outcomes for Serious Game Intervention

The intended learning outcomes (ILOs) for the serious game were as follows:

After playing the serious game and discussing it as a group participants will be able to:

ILO 1. Reduce their fear and increase their confidence in reporting concerns about CAN

ILO 2. Recognise ways of coping with or managing elements of unhelpful thinking that they may have in common with the game characters that are part of their fears.

ILO 3. Reflect on previous experiences and discuss how this affects their decision making.

ILO 4. Discuss as a team and individually what they would do in real life should they come across the situations in the game (relate game to real life).

ILO 5. Recognise how their decision making is influenced by time, stress, patient opinion and the larger dental team.

5.3 **Learning Mechanics-Game Mechanics**

The Learning Mechanics–Game Mechanics (LM-GM) model developed by Arnab et al. (2015) supports serious game design by letting the designer think about the

numerous pedagogical and game elements in a serious game. The LM-GM model includes a set of pre-defined game mechanics and learning mechanics that have been developed from literature on game studies and learning theories (Arnab et al., 2015). There are 41 learning mechanics in the model and 47 game mechanics. Figure 5.1 shows an example of one of the learning mechanics and one of the game mechanics from Arnab et al. (2015). Each learning mechanic includes a definition and a context identifying whether the agent of the action is the learning or the environment or whether it could be either of these. Game mechanic cards include a definition as well as an example.

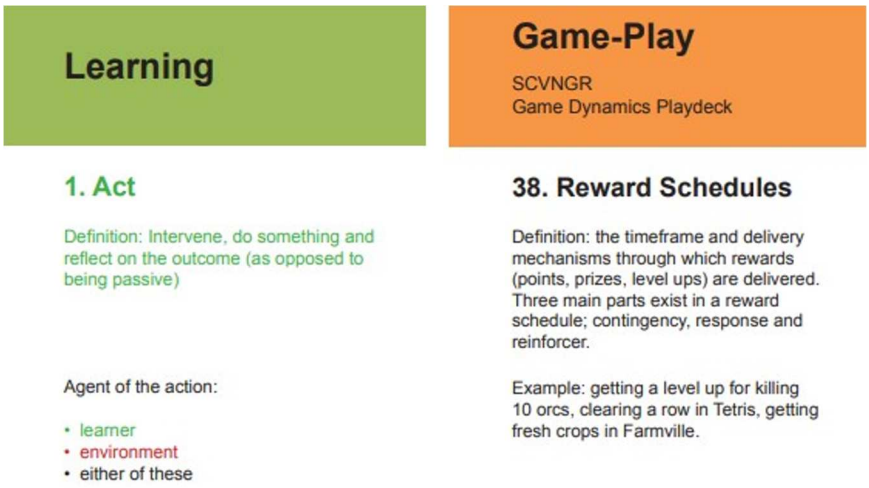


Figure 5.1 Example of One Learning Mechanic and One Game Mechanic

All the potential learning mechanics from Arnab et al's LM-GM model were considered (Figure 5.2) in light of our 5 key learning objectives (section 5.2.1).

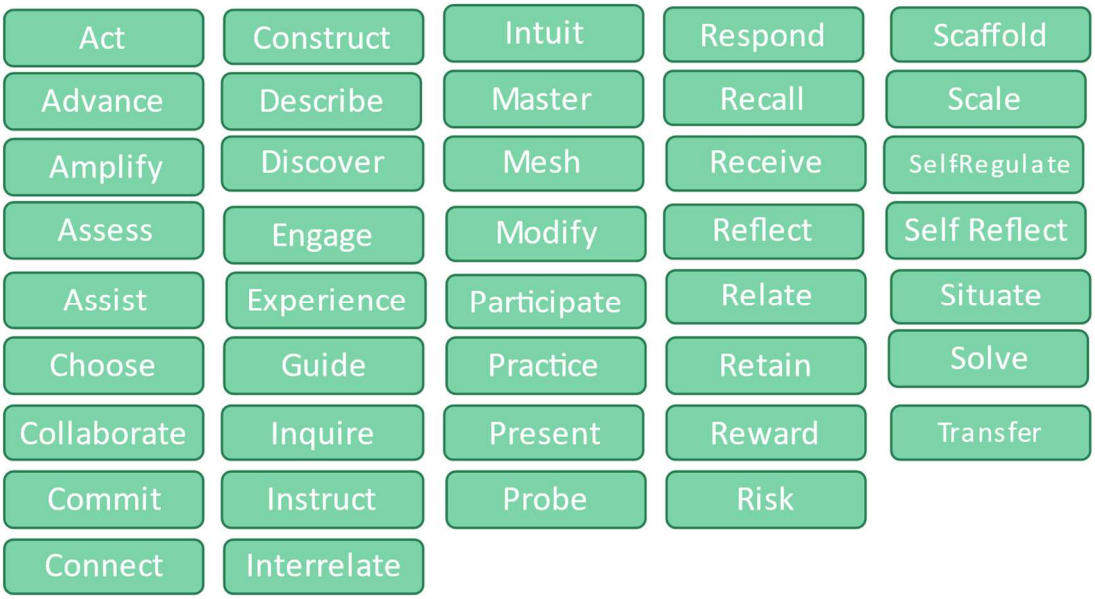


Figure 5.2 The Potential Learning Mechanics from Arnab et al., 2015

Based on the analysis from chapter 4 we identified the following as potentially relevant learning mechanics for our ILOs: Act, Assess, Assist, Choose, Collaborate, Commit, Connect, Discover, Experience, Interrelate, Participate, Practice, Recall, Reflect, Relate, Risk, Self-Reflect and Situate these are highlighted in dark green in Figure 5.3 and the definitions given by Arnab et al. (2015) are shown in Table 5.3 along with which ILOs the learning mechanic was relevant to.

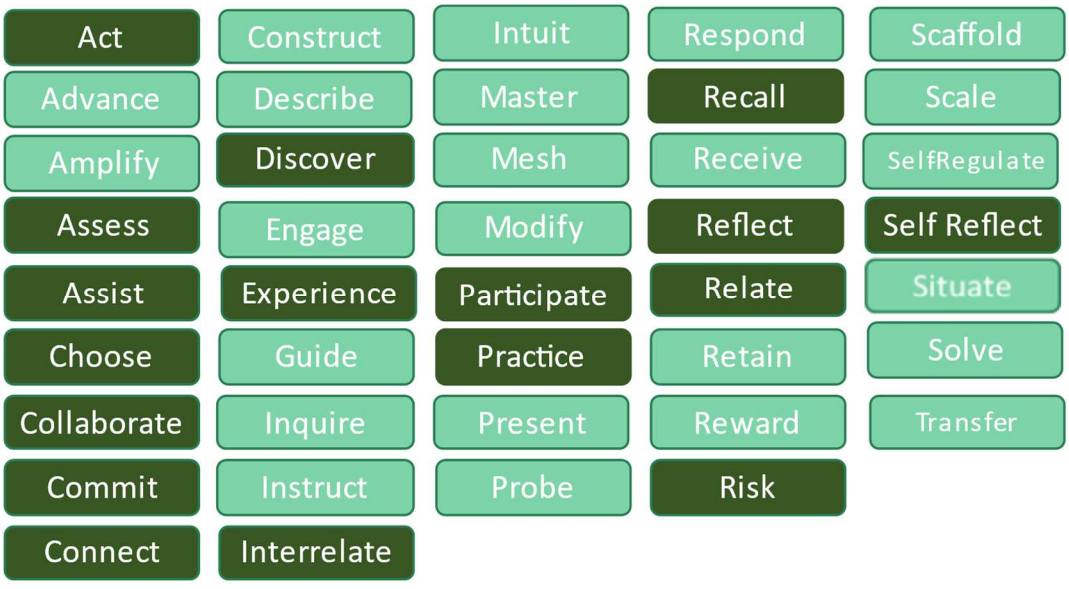


Figure 5.3 Learning Mechanics from Arnab et al., 2015 That are Relevant to ILOs Highlighted in Dark Green

Table 5.3 Table of Definitions of each Chosen Learning Mechanic (adapted from Arnab et al., 2015) and Relevant ILOs

Label	Learning Mechanic	Definition	Relevant ILO(s)
A	Act	Intervene, do something, and reflect on the outcome (as opposed to being passive)	1
B	Assess	Assess acquisition of knowledge, behaviour, and skill.	2, 4
C	Assist	Help, promote or support an equal companion	4
D	Choose	Select from multiple paths/strategies for reaching a goal.	1, 5
E	Collaborate	More than one learner participates in a common learning activity to pursue a common goal.	4, 5
F	Connect	Build knowledge by connecting information	All
G	Discover	Gain understanding and solve problems by exploring, interacting with, and manipulating the environment.	1, 2, 5
H	Experience	Make meaning from direct experience (reflection on doing)	All
I	Interrelate	Recognise relations within and across multiple sign systems (images, words, actions, symbols, artefacts, etc.	All
J	Participate	Bond through shared endeavours, goals and practices.	4, 5
K	Practice	Opportunity to apply (newly acquired) behaviour, skills or knowledge and invoke repetition through compelling, low-stakes experience	1
L	Recall	Recall of prior knowledge (facts, rules, procedures, or skills)	3
M	Reflect	Focus thought on a concept, event, action, or outcome.	All
N	Relate	Recognise and reflect on relationships across different domains	3, 5
O	Risk	Decide how to act in the face of the (low-cost, virtual, consequences).	1
P	Self-Reflect	Focus thought on one's own actions, behaviour, attitudes, learning	All
Q	Situate	Position learning in the context in which it is to be applied	All

The relevant learning mechanics for each ILO are illustrated in Figure 5.4. The active parts of each ILO, namely Reduce fear and increase confidence (ILO1), Recognise ways of coping (ILO2), Reflect and discuss (ILO3), Discuss and relate (ILO4), Recognise influences (ILO5), can be seen to have overlap of the same learning mechanics with between 8 and 11 of the learning mechanics being involved in each ILO. Six of the leaning mechanics (Connect, Experience, Interrelate, Reflect, Self-Reflect and Situate) were involved in all 5 of the ILOs.

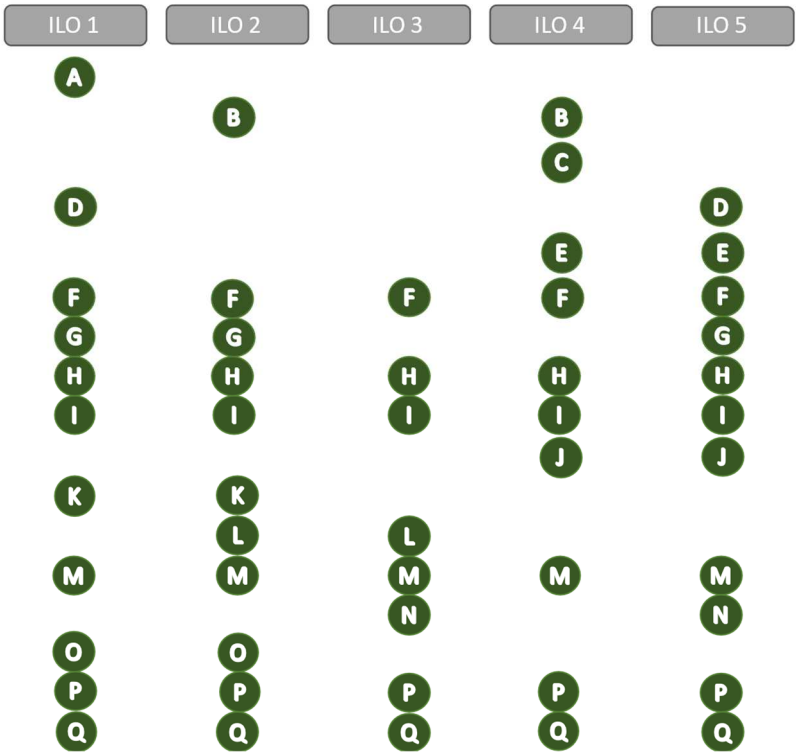


Figure 5.4 Diagram of ILOs and the Relevant Learning Mechanics for Each ILO

The initial idea was that all players would be characters working in the same dental practice. The intention was to design a collaborative game where the players would feel elements of time pressure, stress, and their patient's opinion of them while trying to navigate a normal working day in dental practice with a variety of patients and situations. Players needed to get through a day in general practice while balancing their time, stress levels and patient satisfaction levels. Should any of the players run out of time or lose all patient satisfaction or their stress levels increase too much before being able to treat all their patients of the day then the game is over for everyone. All game mechanics form the LM-GM model (Arnab et al., 2015) were considered and are shown in Figure 5.5. with the selected game mechanics highlighted in dark orange. As there were many potential learning mechanics for each of the ILOs a decision was made as to the most relevant learning mechanics as well as game mechanics based on the purpose and game design, and these are shown in Figure 5.6.

Figure 5.5 Potential Game Mechanics from Arnab et al., 2015
Selected Game mechanics are Highlighted in Dark Orange.

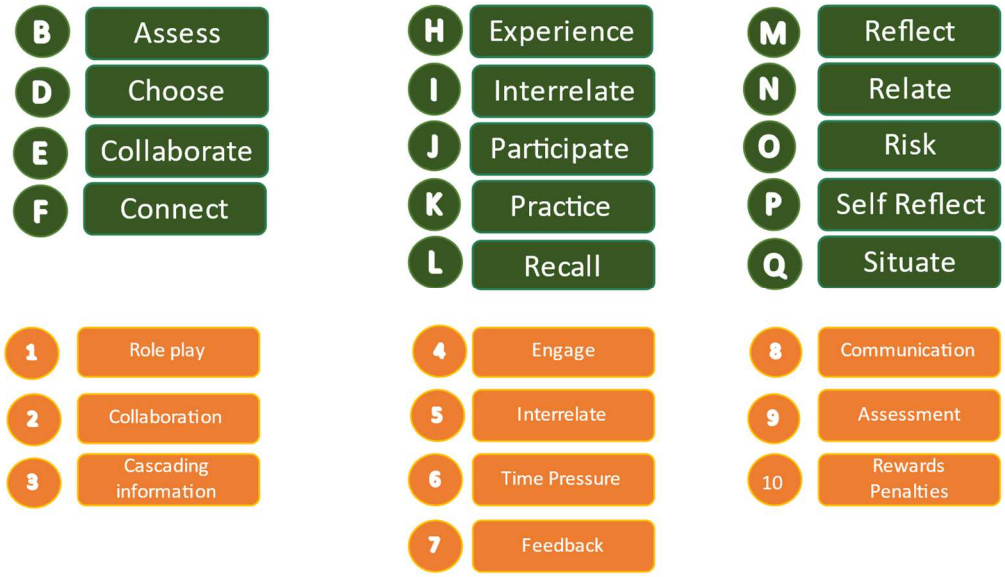


Figure 5.6 Selected Learning Mechanics (green) and Game Mechanics (orange)

The process of the game with the ILOs and associated learning mechanics and game mechanics is illustrated in Figure 5.7.

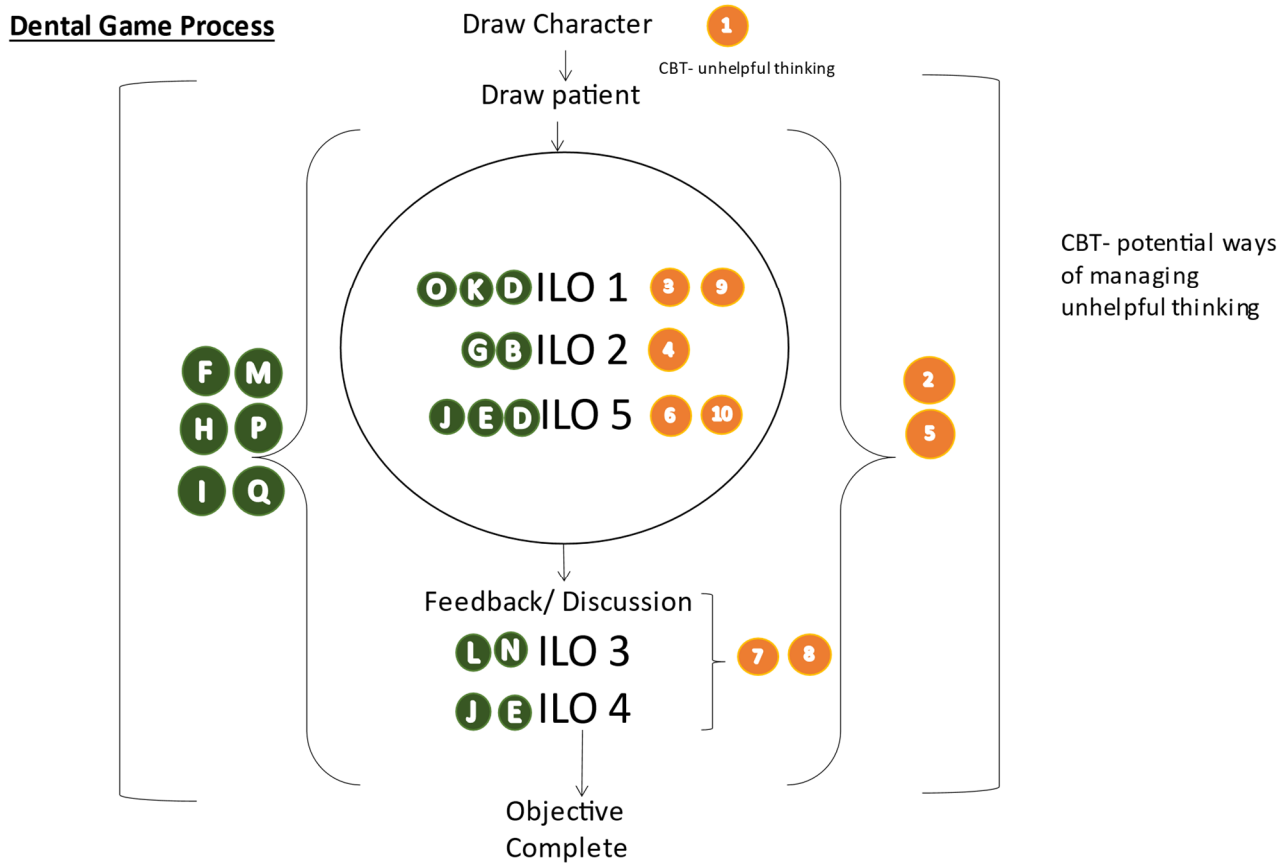


Figure 5.7 Process of Game with Associated ILOs and LM-GM

5.3.1 Gameplay Loops

A starting point idea of how the learning mechanics and game mechanics would be incorporated into the initial idea for the game is shown in Figure 5.8. The gameplay loops for each ILO and the CBT elements were then considered individually and are described in the subsequent sections.

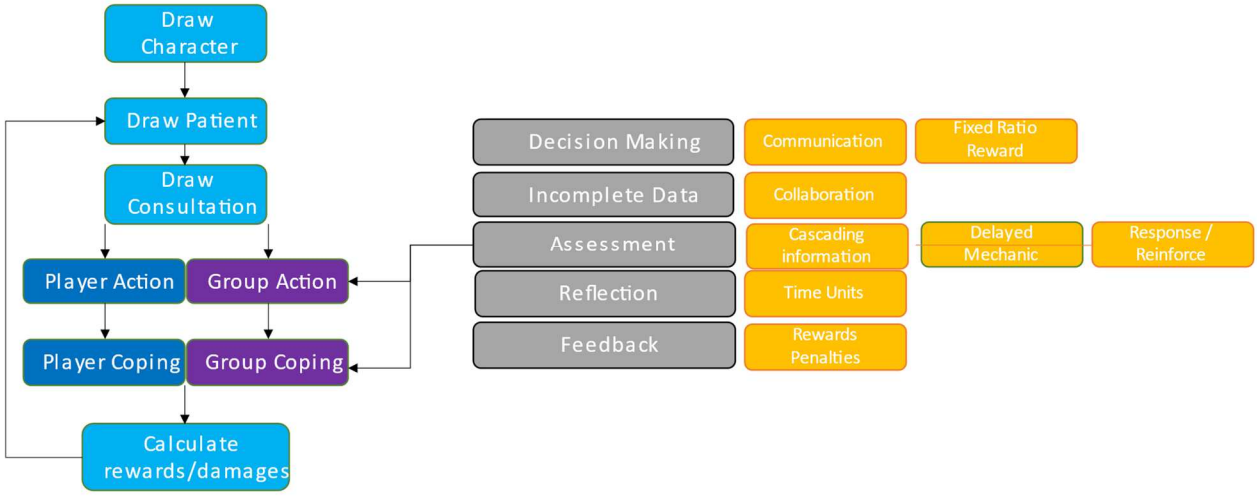


Figure 5.8 Diagram of Starting Point for Designing Learning Mechanics & Game Mechanics into Initial Game Idea.

5.3.1.1 ILO 1 Gameplay Loop

The gameplay loop for ILO 1(Reduce Players fear and increase their confidence in reporting concerns about CAN) is shown in Figure 5.9. An example scenario for this would be when a player has picked up a patient card that is a child and a consultation card that is dental neglect. The player must decide how to proceed by which of the “task” cards to choose. It is challenging because there is limited information regarding the patient and the consultation, and the player will also have a limited number of resources. Some players will have more difficulty choosing the refer option due to the consequences of this for the characters who have elements of fear of reoffering in their thinking styles. The player must assess the situation then decide how to act in the face of the consequences (which in the game are low risk- their stress level, their patient satisfaction level and time pressure). After choosing a task card the rewards and penalties are calculated and the player can practice making this decision even when it is challenging, thereby reducing fear, and increasing confidence through repetition of this low-stakes experience. They then reflect on what made it challenging and use this knowledge and experience for the next time this type of scenario presents either in the game or in real life.

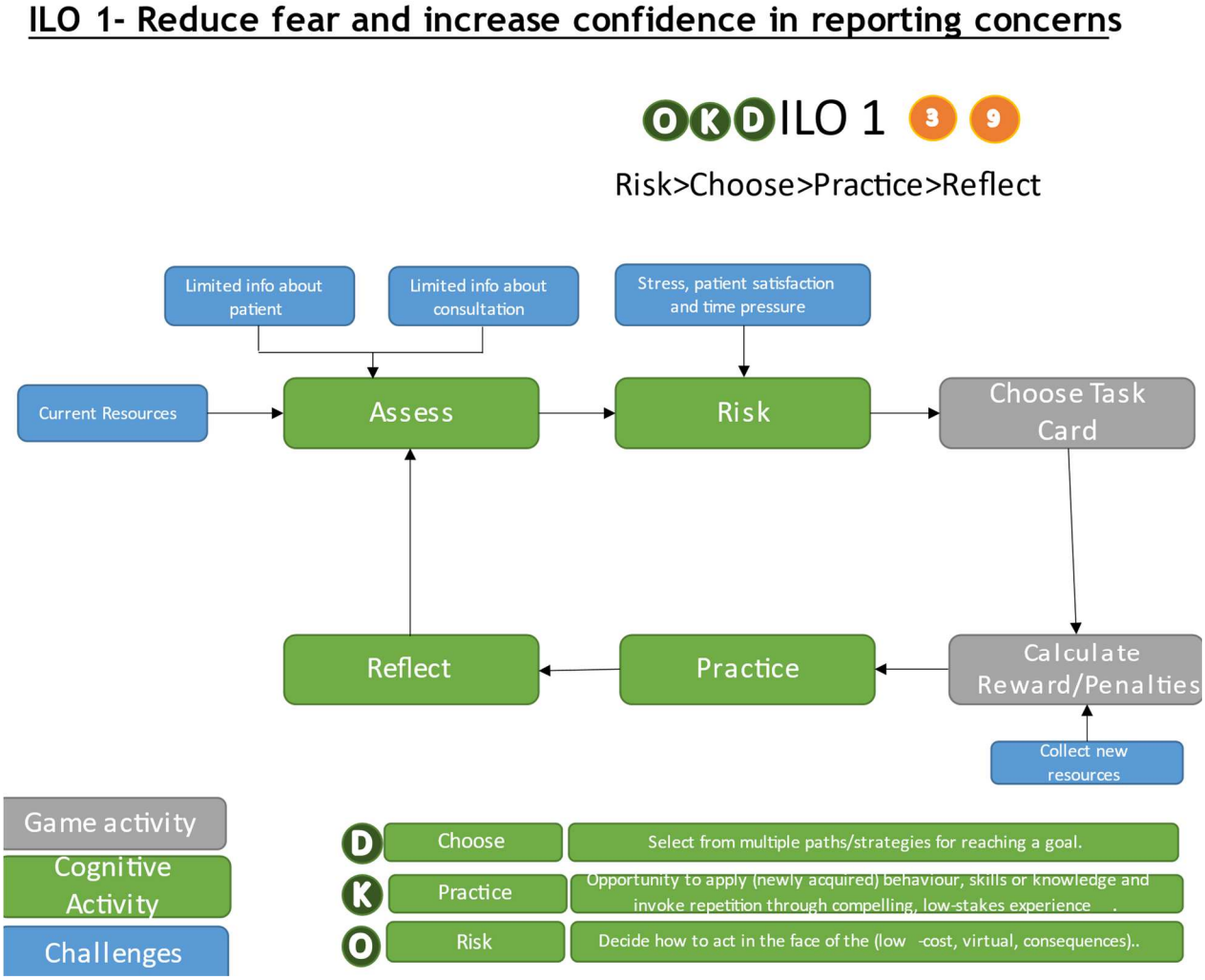


Figure 5.9 Gameplay Loop for ILO 1

5.3.1.2 ILO 2 Gameplay Loop

The gameplay loop for ILO 2 (Recognise ways of coping with or managing elements of unhelpful thinking that players may have in common with the game characters that are part of their fears) is shown in Figure 5.10. An example of this is when a player is engaged in the game as their character. The different characters have different challenges related to unhelpful thinking styles from the Five Areas Approach model of CBT (Williams and Garland, 2002b). There are different resource cards tagged for the different characters challenges which they can discover as they play the game. For example, the Dr Delta character finds referring more stressful as he has a catastrophising style of unhelpful thinking and assumes the worst will happen when he refers. When he discovers the referral resource card tagged to him it removes the extra stress by giving a practical way of challenging those unhelpful thoughts, in this case by reviewing a

selection of clinical notes for other patients Dr Delta has referred and providing evidence that all these patients have stayed registered to Dr Delta. The player on discovering this resource then assess this acquisition of knowledge and self-reflects as to whether it may be useful to them personally in real life, as well as in the game.

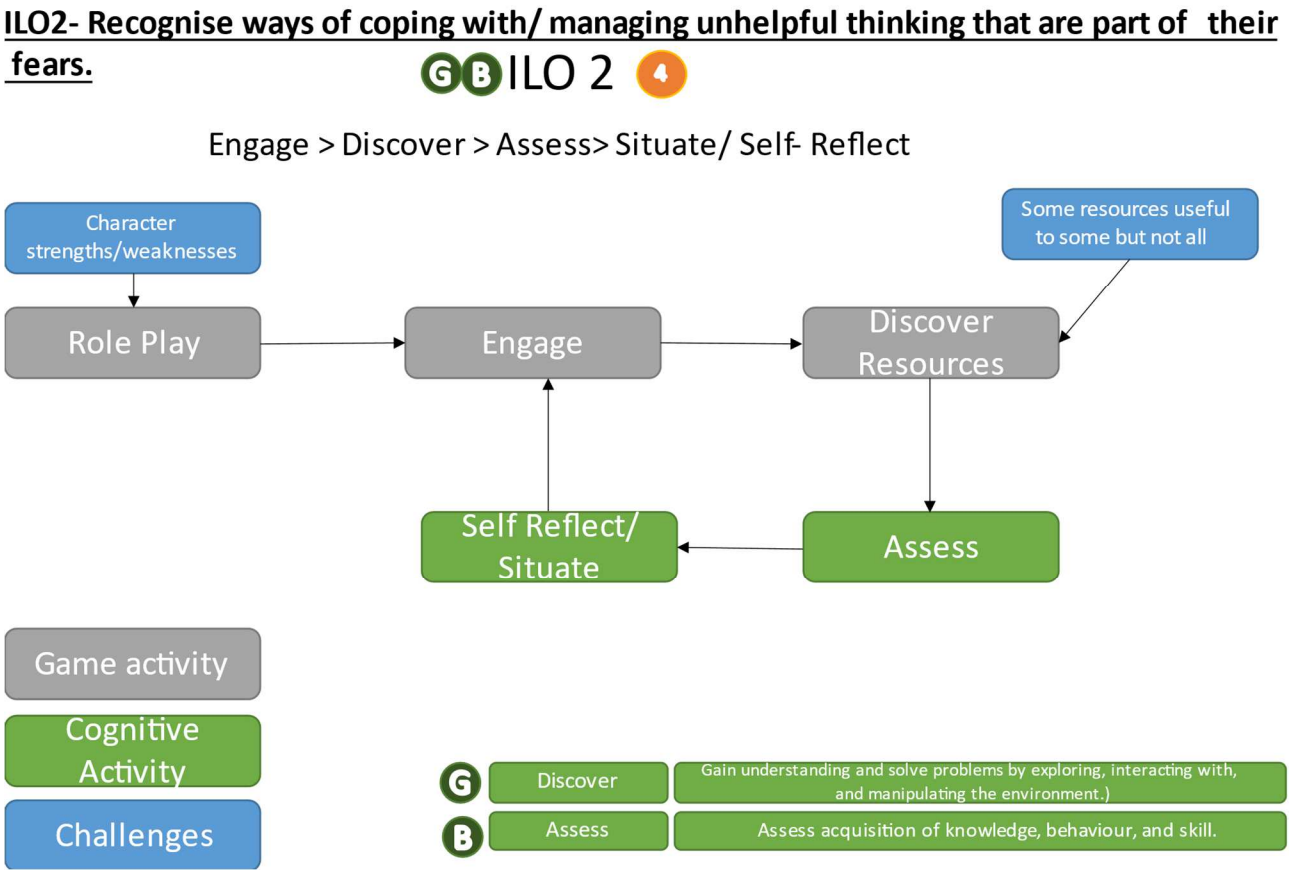


Figure 5.10 Gameplay Loop for ILO 2

5.3.1.3 ILO 3 Gameplay Loop

The gameplay loop for ILO 3 (Reflect on previous experiences and discuss how this affects decision making) is illustrated in Figure 5.11. An example of this is after playing the game a player will talk about a situation they had experienced in their professional life or in the game itself, for example when they have found it difficult to refer a paediatric patient, they have had concerns about. They then reflect on why they found it difficult and connect and relate their decision making to their experiences during the game and in real life so they can communicate and discuss this with the other players.

ILO 3- Reflect on previous experiences and discuss how this affects decision making .

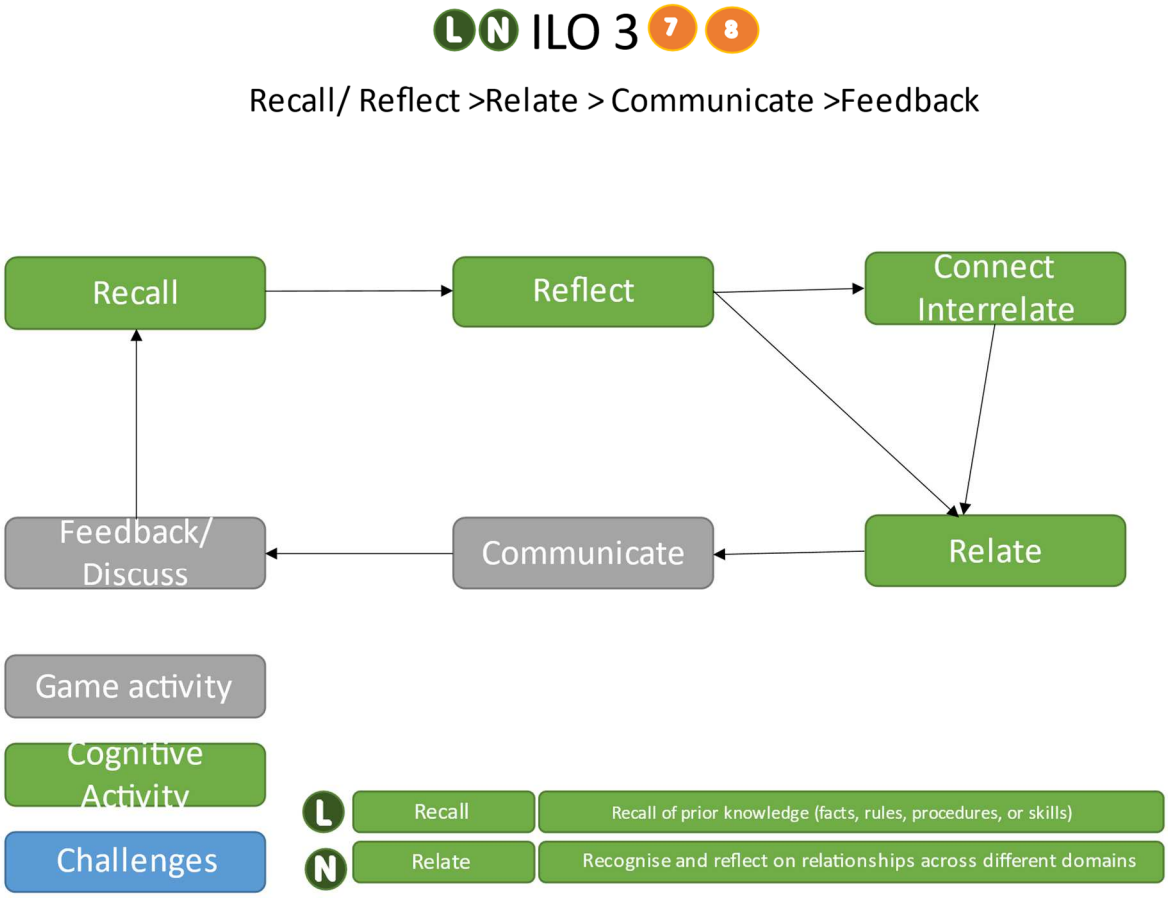


Figure 5.11 Gameplay Loop for ILO 3

5.3.1.4 ILO 4 Gameplay Loop

The gameplay loop for ILO 4 (Discuss as a team and individually what they would do in real life should they come across the situations in the game, relate game to real life) is shown in Figure 5.12. An example scenario for this is a player who has been participating in the game bonds with the other players through sharing the goal of the game (to get through their simulated day). This will vary depending on the other players in the game. At the end of the game during the discussion the players discuss what they would have done in real life had they had to make the decisions in the game and then reflect on the teams they work with on a day-to-day basis and communicate this to the other players who join in the discussion as they have all been working towards one goal in the game.

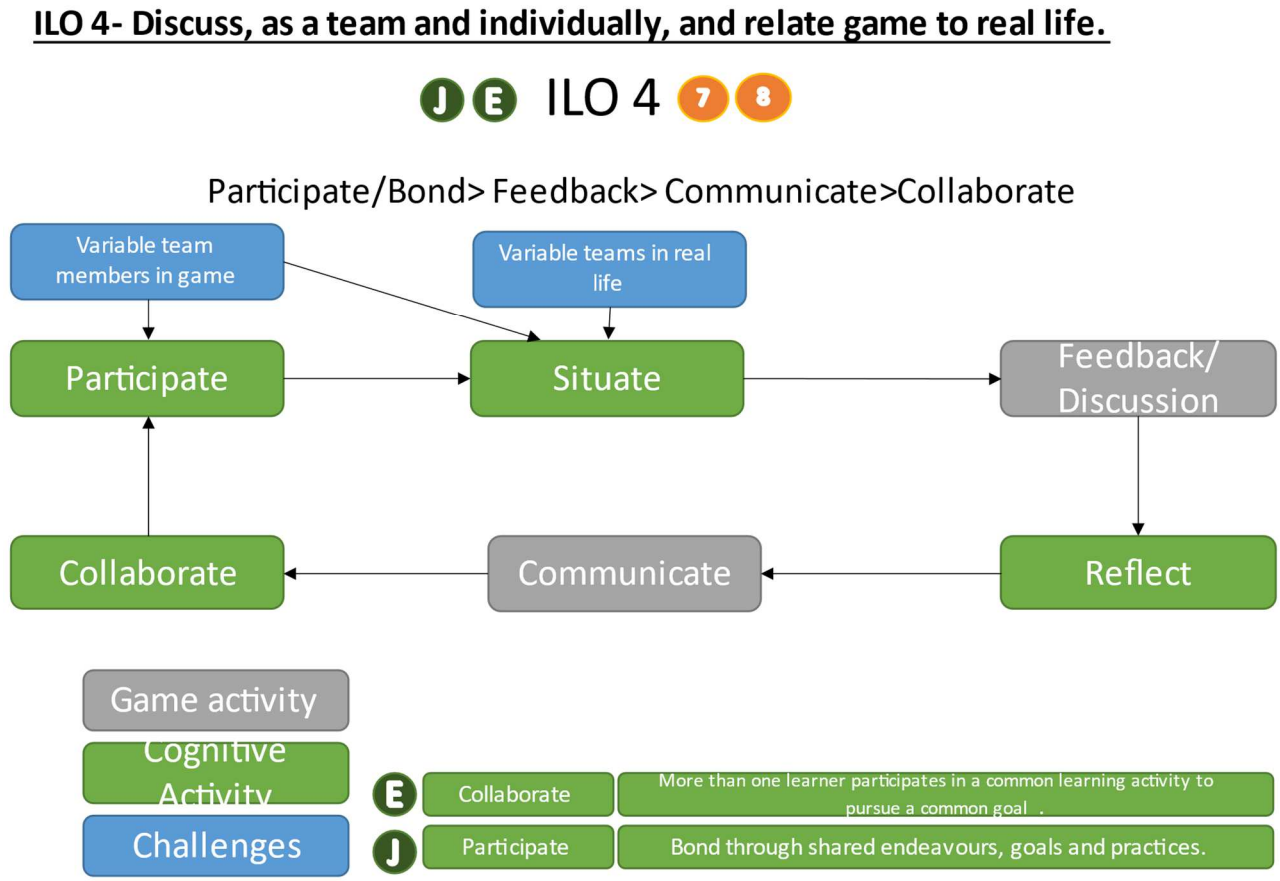


Figure 5.12 Gameplay Loop for ILO 4

5.3.1.5 ILO 5 Gameplay Loop

The gameplay loop for ILO 5 (Recognise how decision making is influenced by time, stress, patient opinion and the larger dental team) is illustrated in Figure 5.13. Here it can be seen that in choosing a task card the player has been considering not only their goals for balancing their stress, patient satisfaction and time but also those of the rest of the players involved, there is some collaboration involved in the decision as to which task card the player will choose. The rewards and penalties are then calculated and communicated to all players and the bond is strengthened while also making all players aware of how the decision to choose what to do has been influenced by all of them as well as the individual players circumstances in the game.

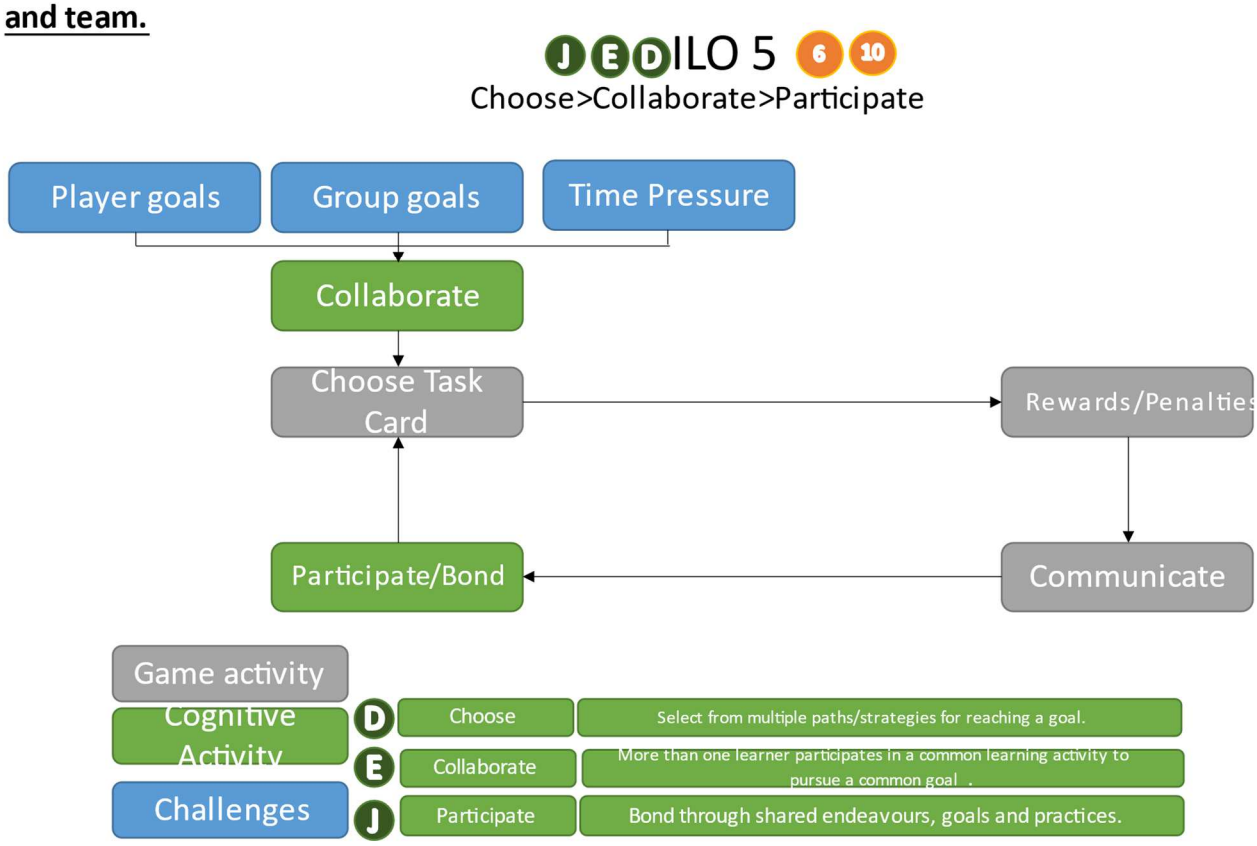


Figure 5.13 Gameplay Loop for ILO 5

5.3.1.6 CBT Gameplay Loop

The gameplay loop for where the CBT elements would be incorporated into the game is shown in Figure 5.14. The elements of unhelpful thinking styles are introduced in the different character traits. The players play the role of their characters and see the other players characters. As they engage in the play the various players pick up resources and discover potential ways of challenging either their unhelpful thinking traits, or their co-payers, they then self-reflect on whether these are actually areas they have issues with in real life that are adding to their fears and discuss this with the other players. The resources that are useful to them in real life are situated and considered during the discussion and self-reflection.

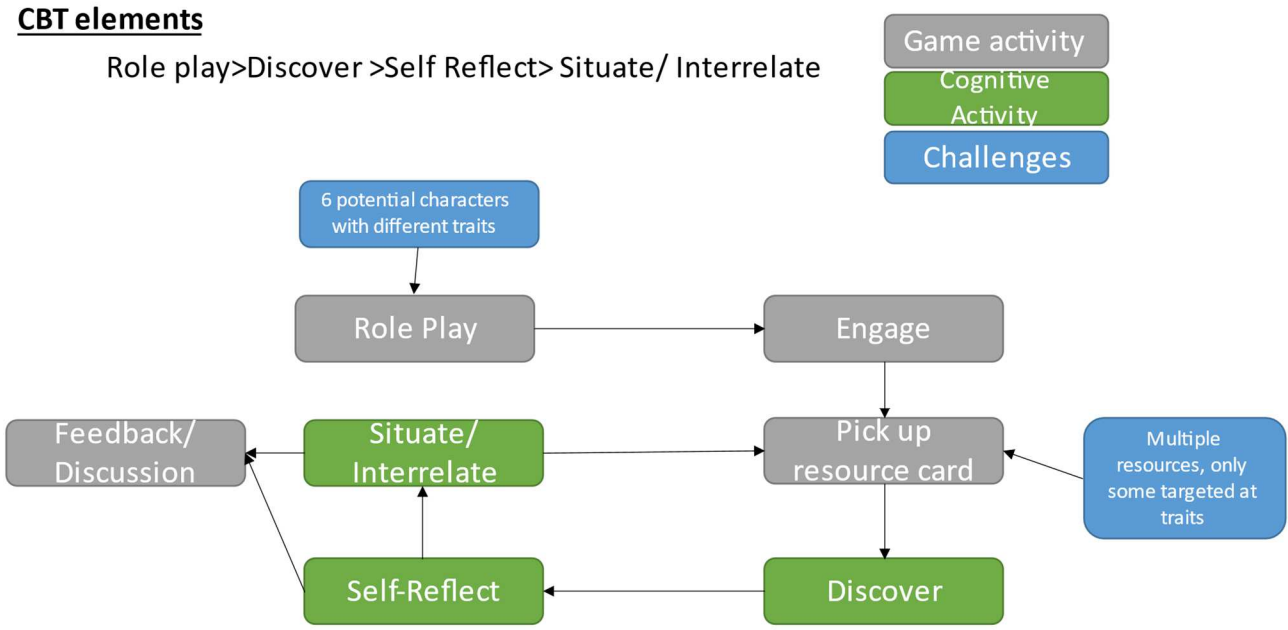


Figure 5.14 Gameplay Loop for CBT Elements

5.4 **Gameplay**

The initial idea was that all players would be characters working in the same dental practice. The intention was to design a collaborative game where the players would feel elements of time pressure, stress, and their patient's opinion of them while trying to navigate a normal working day in dental practice with a variety of patients and situations. Players needed to get through a day in general practice while balancing their time, stress levels and patient satisfaction levels. Should any of the players run out of time or lose all patient satisfaction or their stress levels increase too much before being able to treat all their patients of the day then the game is over for everyone. The photographs

Figure 5.15 5.15 and Figure 5.17 and the diagrams in Figure 5.16 and Figure 5.18 illustrate the process in generating and beginning to formalize the ideas.

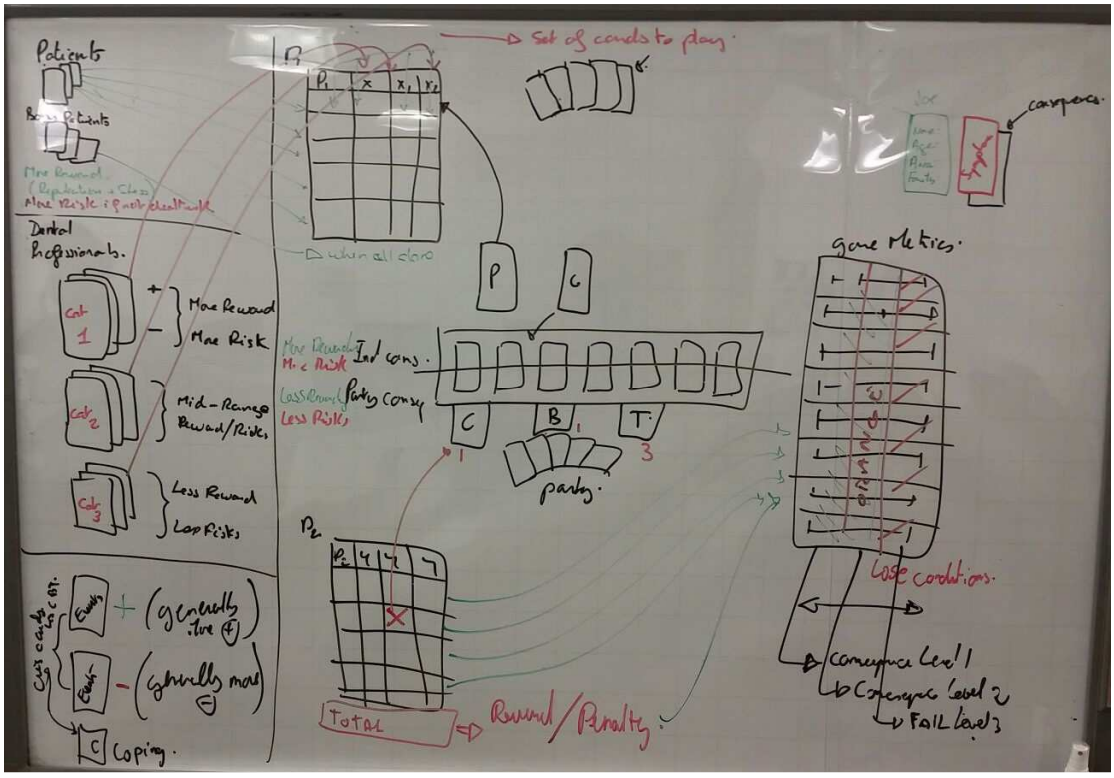


Figure 5.15 Photo of game design process from 18/04/2018

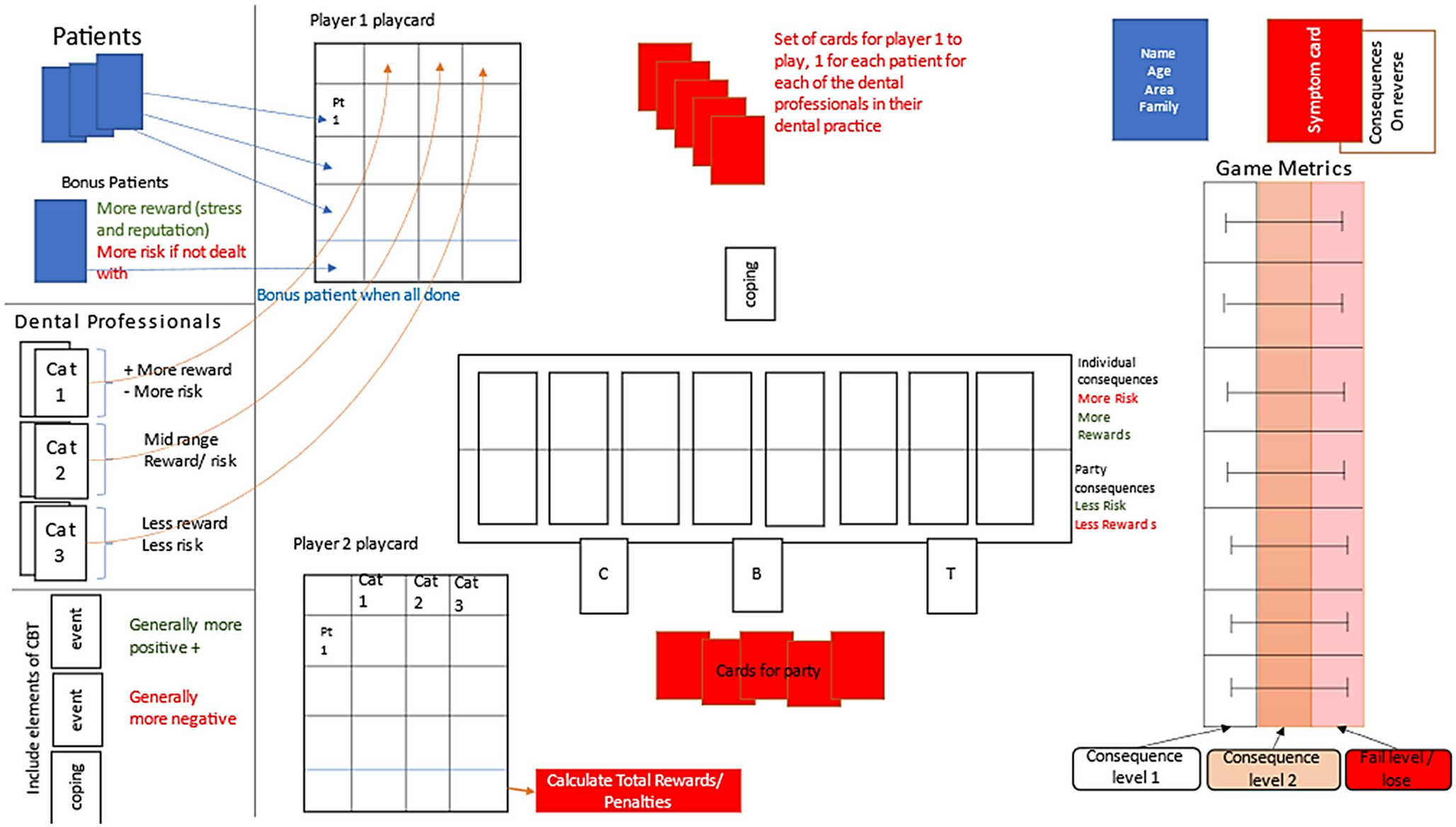


Figure 5.16 Diagram of game design process from 18/04/2018

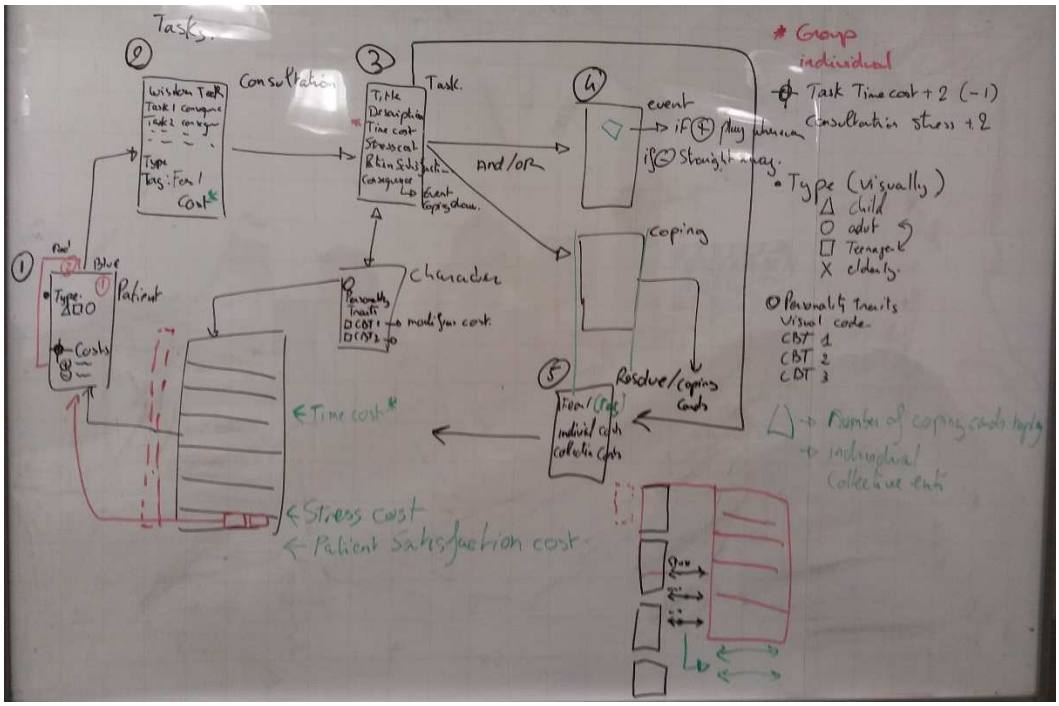


Figure 5.17 Photo of game design process from 02/05/2018

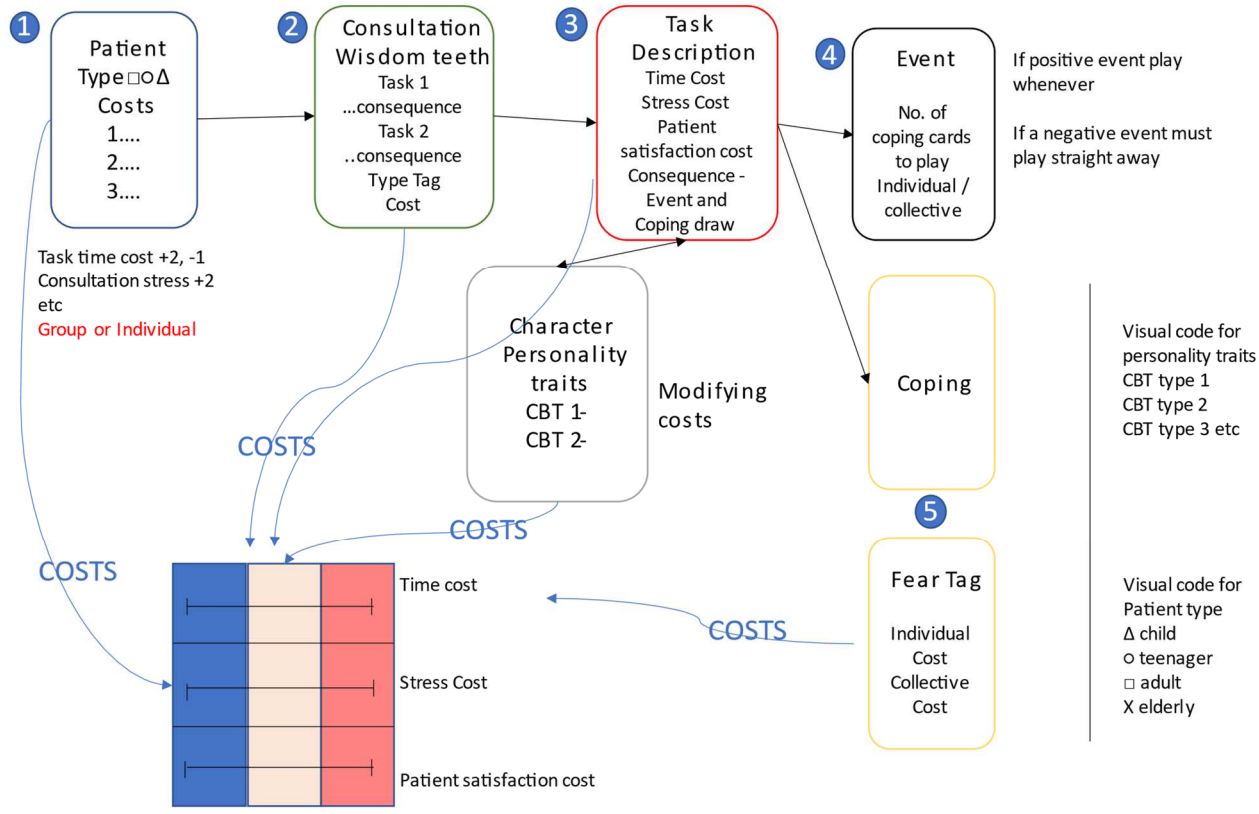


Figure 5.18 Diagram of game design process from 02/05/2018

The component of fear and its management through CBT needed to be included in the game as did some elements of the recognition and reporting of CAN. It was decided that the characters (various dentists) would have characteristics of the "unhelpful thinking styles" mentioned in the Five Areas Approach of CBT discussed earlier (Williams and Garland, 2002b, Williams, 2001) that would make it more difficult for the characters to make certain decisions. It is noted that unhelpful thinking styles occur in everyone from time to time (Williams and Garland, 2002b). The character of “Mrs Alpha” was given some elements of catastrophising, Mr Bravo was given elements of bearing all responsibility, Ms Charlie was given elements of bias against self (own worst critic), negative view about how others see you (mind reading) and setting impossibly high standards for self, Dr Delta was given elements of having a negative slant on things and a gloomy view of the future and bias against self. In their character cards these character traits made some of their choices of what to do in various situations more costly for the players in terms of stress levels. They also had elements that they would find less costly in terms of stress, patient satisfaction or time taken. There were then various resource (or coping) cards in the game which were tagged to the characters and based on potential ways of challenging the unhelpful thinking styles through CBT (Williams and Garland, 2002b).

5.4.1 Sequence of Gameplay

The sequence of gameplay is illustrated in Figure 5.19. In the game each player was dealt 4 patients initially to “treat” in their available time as well as 3 resource/ coping cards. The patients could be adults, adolescents or children and some of the patients had additional “costs” or “benefits” associated with them such as causing the player more stress, or taking them more time, or improving the dentists patient satisfaction levels. Players would then turn over the first patient card and turn over the first consultation card.

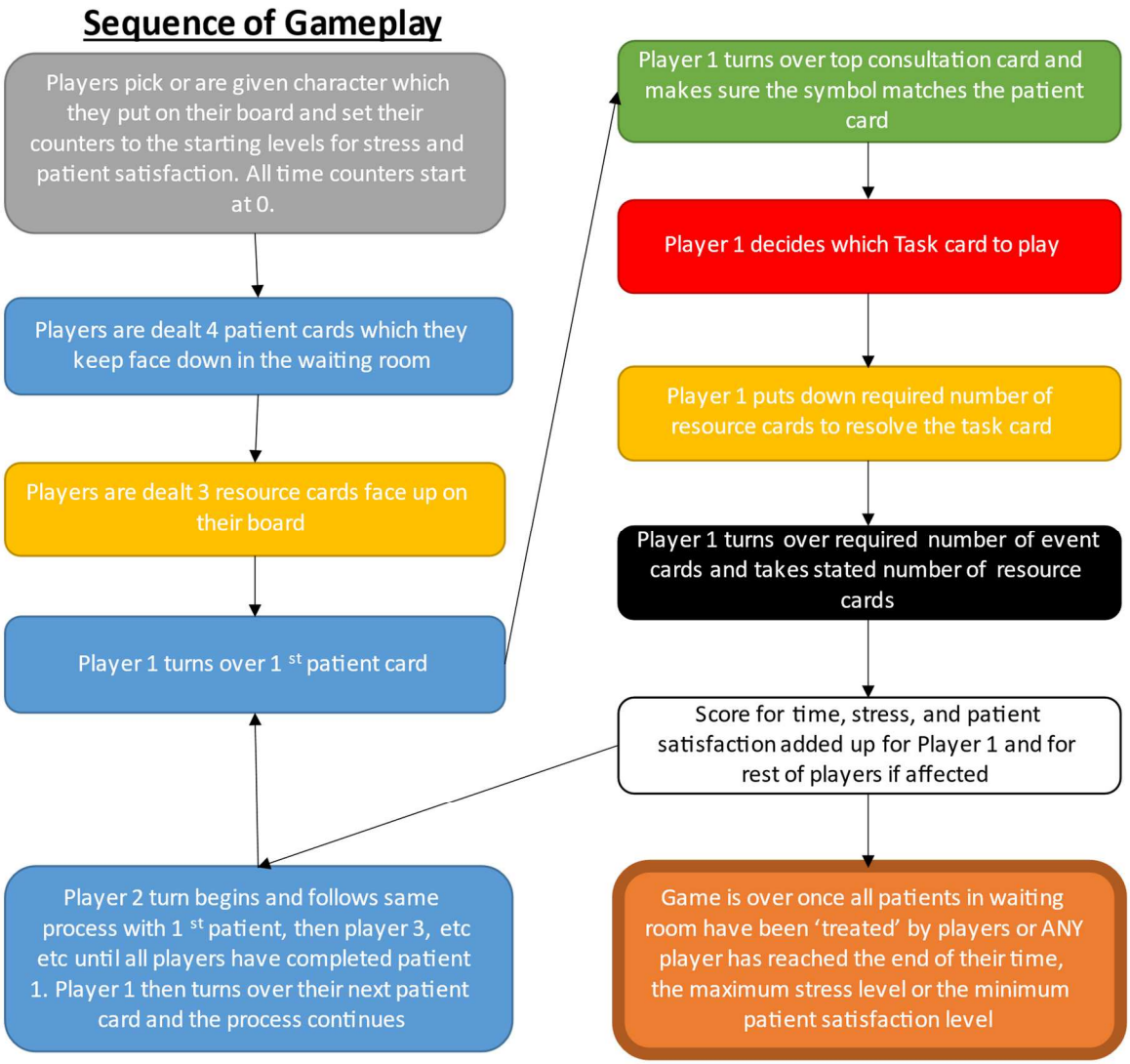
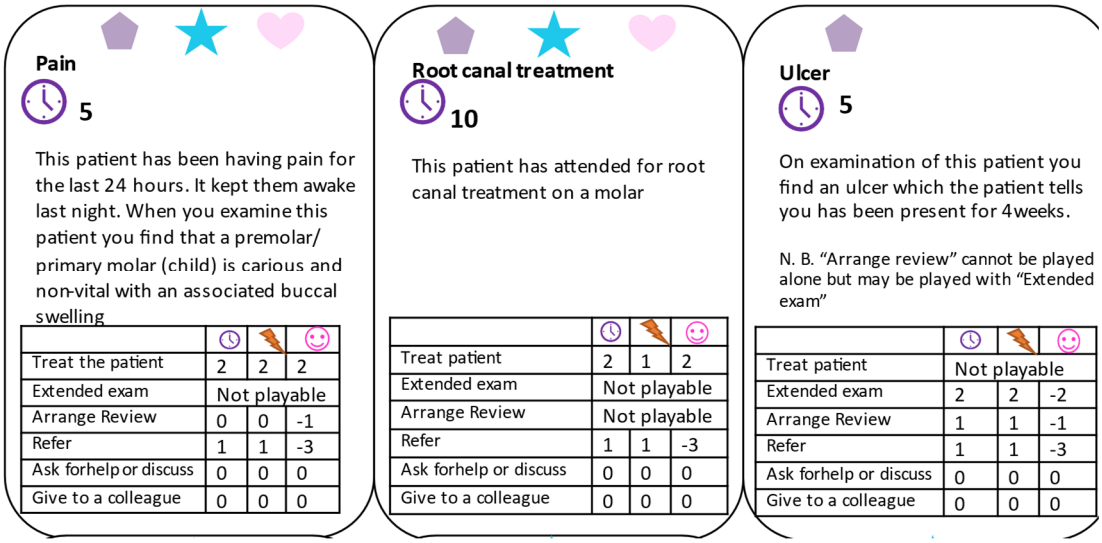


Figure 5.19 Sequence of Gameplay

Consultation cards included a description of the issue the "patient" had attended with as well as what task options were available to the player to decide how to treat the patient. An example of the initial consultation cards is show in Figure 5.20 (the full set of initial consultation cards can be found in Appendix 9). Players then decided on what course of action to take by choosing 1 or more task cards to play. Each task required the use of a resource/coping card and once resolved players had to take at least 1 event card and may or may not replace their resource/ coping cards. Events cards consisted of both positive and negative events and could affect the individual player or all players. Negative events were costly in terms time, stress and patient satisfaction and positive events were beneficial. At the end of a turn all the costs in terms of time, stress and patient satisfaction are added up for the player themselves and

the rest of the players also adjust their scores for any events that affected them.



Treat the patient	2	2	2
Extended exam	Not playable		
Arrange Review	0	0	-1
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Treat patient	2	1	2
Extended exam	Not playable		
Arrange Review	Not playable		
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Treat patient	Not playable		
Extended exam	2	2	-2
Arrange Review	1	1	-1
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Figure 5.20 Initial Consultation Cards
Symbols on the top of the card relate to whether this consultation card is relevant to an adult patient (purple pentagon), an adolescent patient (blue star) or a child patient (pink heart). The card has a title indicating the subject of the consultation with a brief description and a clock face and number corresponding to how many time units this will "cost" the player. The table has the potential task cards the player may choose for this consultation with the additional costs in terms of time, stress and patient satisfaction.

5.5 Initial Prototype

An iterative design process was used (Fullerton, 2018) where ideas are generated, formalized, tested, and evaluated. In the evaluation if there are issues or problems with the design then you return to the cycle of generate ideas, formalize ideas, test ideas, and evaluate the results until there are no problems, making changes and refinements to give balance to the game.

The initial prototype consisted of 4 character cards, an example of one is shown in Figure 5.21, 8 patient cards, 9 consultation cards, 8 task cards, 24 event cards, 24 resource cards (all initial cards are in Appendix 10) and simple scales for time, stress and patient satisfaction on which a counter could be moved up and down. The character cards had the name of the character and a coloured symbol on one side with their name, the character description (including the elements of unhelpful thinking from CBT), their starting levels for stress and patient satisfaction, their strengths and challenges (in the example in Figure 5.21 Mrs Alpha is fast so takes -1 time to treat patients, but finds referring

difficult as she assumes the worst will happen so referring costs her three times as much stress).

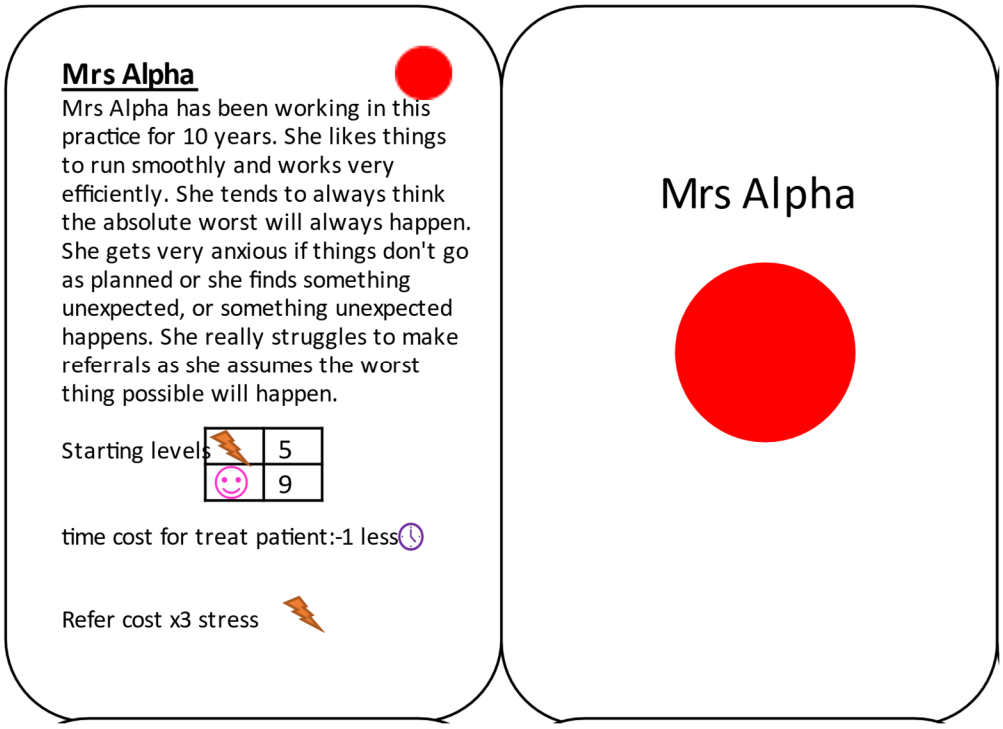


Figure 5.21 Example of one Character Card

5.5.1.1 Trial of initial prototype

The initial prototype was tested at the West of Scotland British Society of Paediatric Dentistry Study Day held in Glasgow on 16/05/2018. Feedback received was that the game was too difficult with few teams managing to win. It was reported that some of the events were too catastrophic and that the scales were difficult to adjust. Also, it was reported that the cards were too small and difficult to read. Following this feedback, a gameboard was constructed for each player with spaces for setting out the various cards as well as displaying the scales in an easily visible manner with red indicating that players were getting close to a “losing” zone and black on each scale indicating the end zone. Symbols for stress (lightning bolt) and patient satisfaction (smiley face) were also added to make it easier to differentiate the scales. Additionally, numbers were added to the scales at every 5 spaces to make it easier for players to see where they were and calculate the number of spaces to move at the end of each turn. Instructions were also added to the game board to make it easier to follow

(Figure 5.22). The different types of cards were made larger and easier to read and were colour coded according to the different type of card (clear covers for the character cards, blue for the patient cards, green for the consultation cards, red for the task cards, yellow for resource cards and black for the events cards). The board was colour coded to correspond to this.

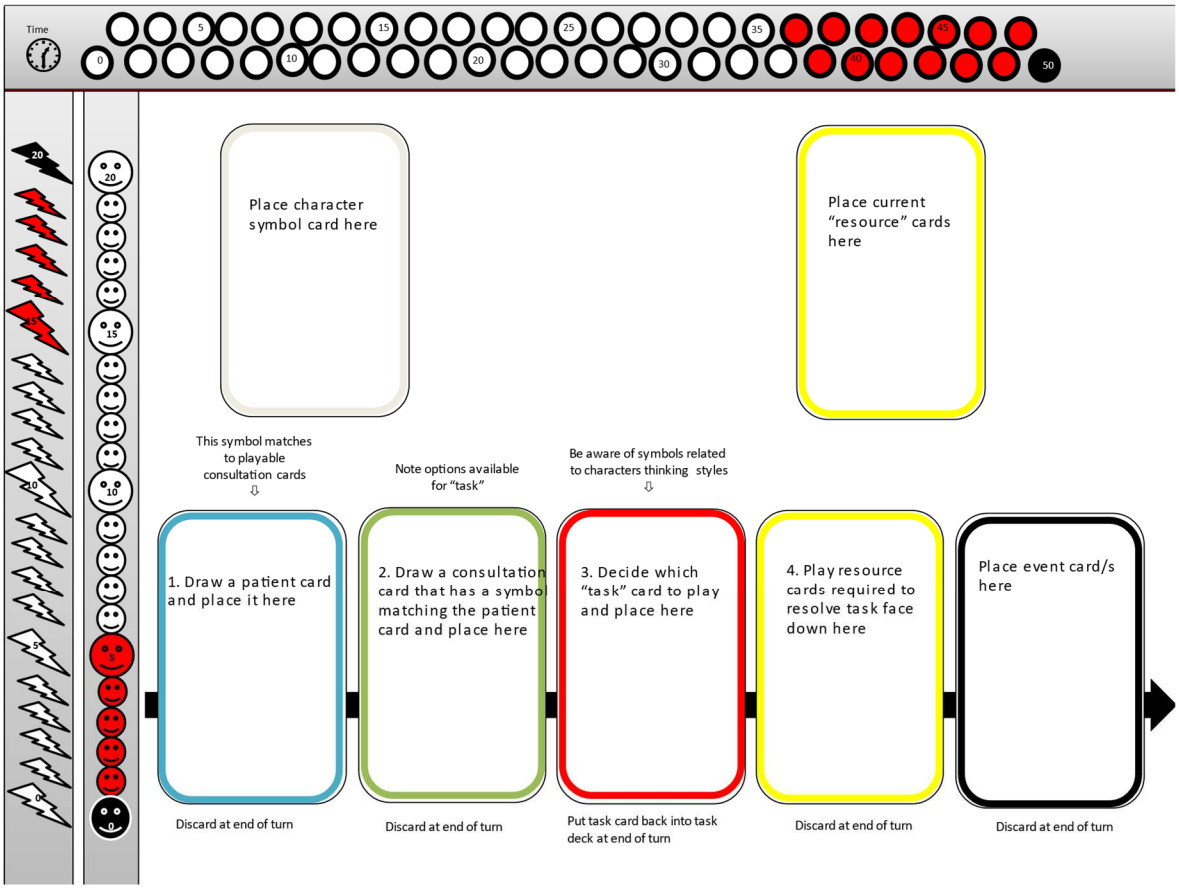


Figure 5.22 Image of Game Board Designed

5.5.2 Playtesting

The game was first play tested with a small group of undergraduate dental students (one final year, one 4th year and one 3rd year) and a member of the Learning Enhancement and Academic Development Service (LEADS) at the University of Glasgow who was interested in the game (Figure 5.23). It was then play tested with a group of MSc in Serious Games and Virtual Reality Students in the School of Simulation & Visualisation at Glasgow School of Art.

Figure 5.23 Photographs of Playtesting with Dental Students and LEADS staff member

All feedback from the sessions was recorded in note form and participants could follow up with further comments by email after the session if they wished. All comments received were thematically analysed and grouped under 3 main themes: Game Experience, Reflections, and Improvements (Figure 5.24).

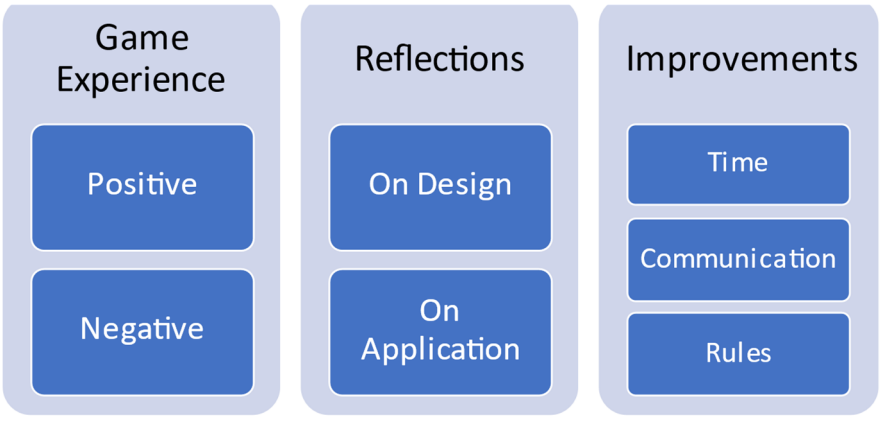


Figure 5.24 Themes from Feedback from Playtesting

Under the theme of game experience there were 2 sub themes namely Positive and Negative Game Experiences. The positive experiences included the being “quite addictive” with participants commenting they “really enjoyed the concept and format of gameplay. The negative experiences included” it muddles

the gameplay to exchange cards in the middle of a turn" and "the description of Mr. Bravo character needs work".

Interestingly in the theme of Reflections there were 2 sub themes- reflections on the design and reflections of the application of the game. The reflections on the applications all came from dental students", they "enjoyed the real-world applications" and it gave "the frantic pace of a busy surgery". The reflections on the design came mainly from the serious game design students which was unsurprising as this is essentially what they study. They commented on the need for "clarity" and the need for "a run through of a single player shot".

Both groups of students have ideas for Improvements which became the third theme. The sub themes including improvements to do with managing time and communication in the game and the last sub theme being a desire for improvements in the rules. The suggestions for improvements in time in the game came from both dental students and serious game students. The dental students wanted to make the pace more frantic saying "introduce a time limit on each players turn", "if still not decided what to do after a time limit is up, they are unable to help other dentists" and "with every 90 seconds past time limit patient satisfaction decreases". In this theme the serious game students were more practical in their suggestions for example "keep track of patients for the day with some sort of waiting room with the cards upside down. Communal for all players".

In the improvements for communication sub theme the serious game students wanted more clarity "it should be made clear when/ how you transfer a resource card" and the dental students gave practical "real world" suggestions of how to limit this "maybe allow transfer of resources cards during a tea break that only comes when each member of the team has finished their first, second, third, fourth patient".

The suggestions for improvements in the rules all again came from the serious game students saying, "make it clear that can trade cards that would benefit other", and "turns need to be clear in the rules".

All the feedback received gave rich ground for improvements to the game. All suggestions were considered, and some were acted upon. The rules were improved a separate waiting room board was also constructed with named spaces for each player to keep their patient cards, while each player would have a separate game board each (Figure 5.25). The other comments were considered but it was felt that they would make the game too complicated, as there is already an element of time in the game adding further time limits would be too confusing. It was interesting that the comments on design came from the serious game students and the ones on real life applications came from the dental students. This demonstrated how valuable it was to have the 2 types of students play test the game as had only one group been used either a lot of the potential design improvements would have been missed or it would have been disheartening that no one could see how this came could be beneficial in “real life”. These results from the playtests also fed into the design of the formal evaluation plan for the game (Chapter 6). They provided information to help with construction of a topic guide for focus groups and provided ideas for the development of a pre/post-test questionnaire.

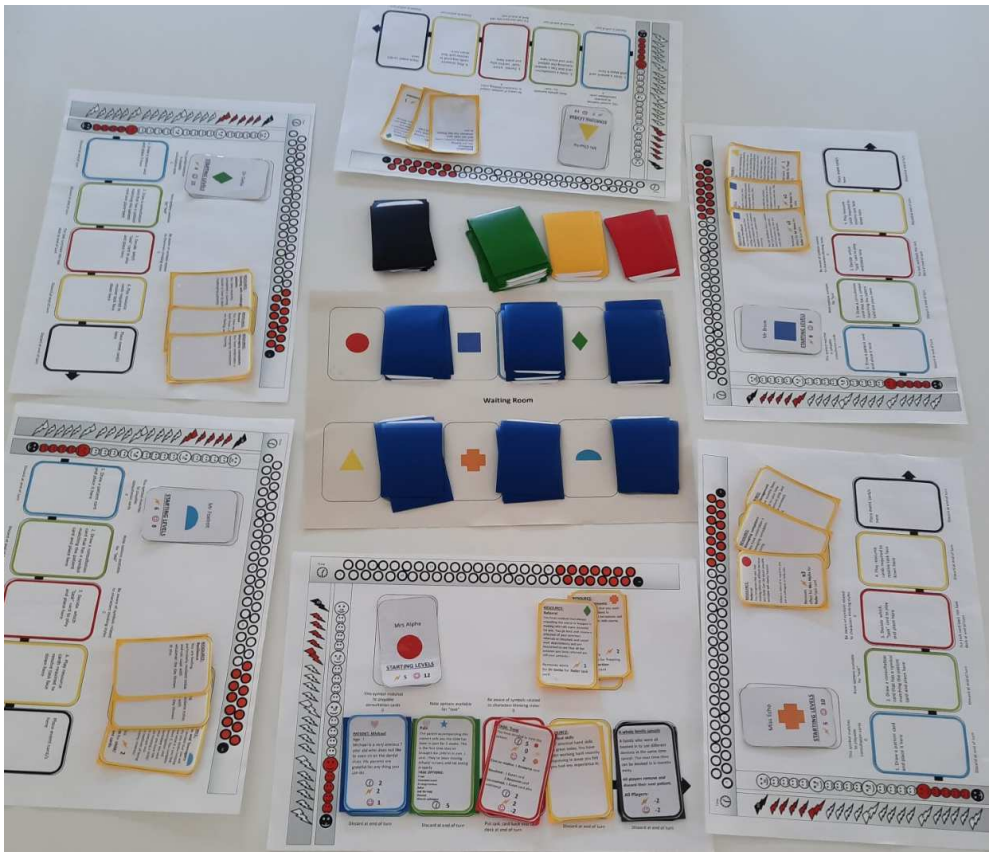


Figure 5.25 Image of Game Boards and Waiting Room Boards in Play

The final Playtesting was done at the Scottish Dental Show in April 2019 where two workshops (spaces for 12 participants at each workshop) were set up. Although both workshops were fully booked, only 14 participants turned up on the day to play the game. All players enjoyed the game but again commented that it was useful to have run through of a player turn before playing the game. The players commented that it would be a useful game to play in their respective dental teams to undertake group CPD.

5.6 Final Game Produced

The final board game and cards can be seen in Figure 5.25. The final cards for the characters, patients, consultations, tasks events and resources can be found in Appendix 11.

At this stage, the game had been play tested with undergraduate dental students, serious game students and dental team professionals with no serious flaws identified so it was felt that this was an appropriate stage to formally evaluate the game.

5.7 Summary and next steps

The design process involved deciding firstly on the area of intervention for the serious game, deciding on learning objectives for the game and using the LM-GM model to match the game mechanics. An iterative design approach was undertaken to develop a prototype which was then modified before being play tested and modified further.

Following on from this the next stage was to formally evaluate the game. Without formal evaluation there is no way to be able to claim that a game is doing what it was intended to do. There are potentially many areas of a game that could be evaluated such as the aesthetics, the usability, the playability or whether it met the intended aims and objectives. This is thoroughly discussed in the next chapter (Chapter 6) Evaluation of Serious Game.

Chapter 6 Chapter 6 Evaluation of Serious Game

6.1 Introduction

The overall main research question was “What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?”. The evaluation of the serious game we produced aimed to answer the second part of this question, namely can a serious game provide an effective support for training in child protection?

There are many ways in which to evaluate a serious game (Petri and Gresse von Wangenheim, 2017, Dondi and Moretti, 2007, De Freitas and Oliver, 2006, Calderón and Ruiz, 2015, Connolly et al., 2012, Abdellatif et al., 2018).Games can be evaluated using a simple style of evaluation where the participants play the games and then information and opinions are gathered using questionnaires or interviews, alternatively pre and post-test questionnaires and/ or interviews can be done and sometimes a pre and post/ post type of evaluation is done where the participants are asked questions (by questionnaire, focus group or interview) before they play the game, after they play the game and then again later in time (Calderón and Ruiz, 2015). Most literature of the evaluation of serious games pertains to video games. In their narrative review of serious game evaluation frameworks in which they also propose their own evaluation framework Abdellatif et al argue that the primary quality characteristics of serious games are a learning outcomes evaluation, evaluation of the pedagogical characteristics, engagement, motivation, user experience, usability and understandability (Abdellatif et al., 2018). In a systematic review of how games for computing education are evaluated over forty different analysis factors were noted from 112 studies with the most common analysis factors being learning (88 studies), quality (38 studies), confidence (28 studies) and fun (27 studies) (Petri and Gresse von Wangenheim, 2017). The authors conclude that there is a lack of consensus about key analysis factors for evaluation of games used for computing education. This has also been the conclusion of other systematic reviews of the evaluation of serious games (Connolly et al., 2012, Calderón and Ruiz, 2015). Calderón and Ruiz (2015) found that questionnaires and interviews were the most common techniques to evaluate serious games with 90% of the 102 studies they reviewed using questionnaires as the main method for the evaluation and

20% using interviews. Most of these studies reviewed used both quantitative and qualitative questions with the Likert scale as the preferred method. Their review found 18 different quality characteristics that were evaluated with the most common being learning outcomes, usability, and user's experience (defined as the user's behavior, attitude, and emotions while using the serious game). Additionally, this paper also reviewed the types of evaluation procedure undertaken in the studies and found that most studies did a simple evaluation, with 35 doing a pre-and post-test and only 4 doing a pre- and post/post- test (i.e., 2 post-tests at different times during the follow up). This systematic review also found that a study sample size of 11-20 is the most common sample size used in evaluation studies.

There are challenges in evaluating serious games in general. Learning from a serious game can be assessed quickly for knowledge but the assessment for change in attitudes, beliefs, behaviours, or complex topics must be longitudinal. The longitudinal assessment for change or for complex topics is one of the reasons that sample sizes for evaluations are small as it is easier to follow participants up. It is also known that a lot of serious games are produced by businesses for themselves or other businesses and are rarely made public or accessible for evaluation. They will also often be produced on a time scale that does not allow for evaluation. The literature has demonstrated that in the plethora of studies on serious games there are only a few who even attempted to evaluate the effectiveness of serious games in a rigorous manner (Westera, 2019). It is also acknowledged that due to publication bias the available literature on the evaluation of games may be lacking in those games whose evaluation was less than 'glowing'. The "simple" style of asking participants what they thought about the game they have just played is less rigorous than using a valid, reliable, calibrated survey instrument for pre- and post-testing (Westera, 2019). There is also debate whether randomised controlled trials (RCTs) are of benefit in the evaluation of serious games (Westera, 2015) with some authors arguing that they are required and are currently lacking (Connolly et al., 2012). Whilst others argue that such research methods are not appropriate as the variables cannot be adequately controlled in research on teaching methods (Shaver, 1983). Other arguments against RCTs in this type of research include discussion on what statistical tests and parameters should be

used to determine whether effects are significant or not (Lew, 2013, Johnson, 2013). Qualitative evaluation might perhaps be more important in this context.

6.2 Evaluation of Serious Game Produced

The goal of this part of the research was to evaluate the serious game that was developed. The purpose of the serious game developed was to:

1. Put child protection into the context of the working day of a dental practice in order to facilitate reflection on previous experiences and attitudes thereby influencing future choices.

2. Highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making.

3. Introduce the game players to ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters, so that they can use this in their future professional decisions and lives.

This evaluation aimed to determine whether there was any change in attitudes between and after playing the game as well as whether the game functioned as a vehicle to help facilitate reflection. The evaluation also aimed to assess the impact of the approach. The type of impact sought is evidence of reflection around previous experiences or considerations of what participants would do in their real working lives if any of these situations occurred, and discussion or acknowledgement of how their decisions could be influenced by time, stress, patient opinion and the larger dental team.

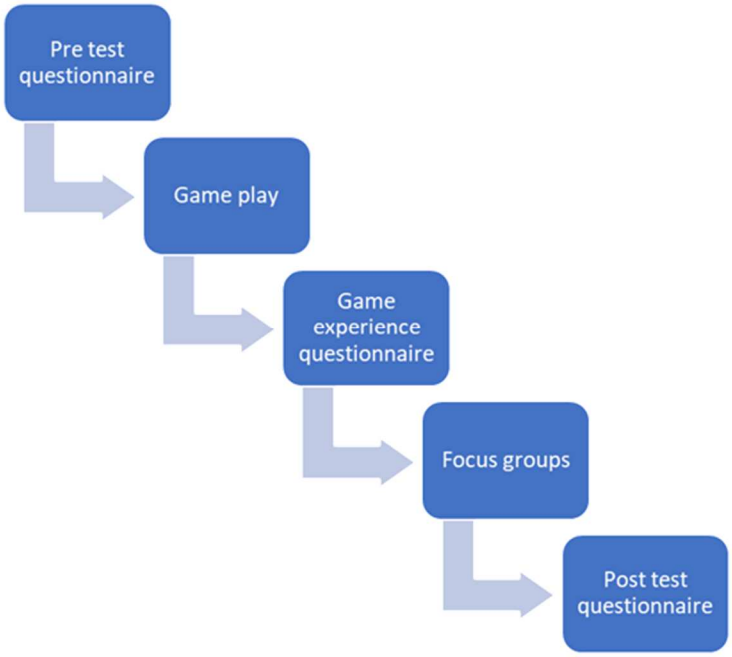


Figure 6.1 Diagram of Evaluation Study Design

There are three elements to the evaluation, namely a pre- and a post-test questionnaire, a game experience questionnaire and focus groups (Figure 6.1). The parts of the evaluation that were expected to be addressed or evidenced by each element are summarised in Table 6.1.

Table 6.1 Table of Elements of Evaluation Mapped to Rationale for Inclusion, Evaluation Questions, Purpose of the Game and Hypotheses

Element of Evaluation	Rationale for Inclusion	Evaluation Question Addressed	Evidence for which purpose of the serious game	Hypothesis Addressed
Pre- and Post-test Questionnaires	Method for evaluating attitudes before and after playing the game	Does the game have any impact on the attitudes of the participants?	Put child protection into the context of the working day of a dental practice in to facilitate reflection on previous experiences and attitudes thereby influencing future choices	Participants will enjoy the game and it will make them think about their own concerns /anxieties/fears about potential cases and how to act despite competing pressures.
Game Experience Questionnaire	Method for evaluating whether the game is enjoyable (via the core module of the	Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible?	Put child protection into the context of the working day of a dental practice to facilitate reflection on previous experiences and attitudes thereby influencing future choices.	Participants will enjoy the game and it will make them think about their own concerns /anxieties/fears about potential cases

	GEQ) and whether it works as a co-operative game (social presence module of the GEQ).	Does the game work as a cooperative game?		and how to act despite competing pressures.
Focus Groups		Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible? Does the game facilitate reflection on previous experiences? Does the game facilitate consideration of what participants would do in real life if situations like the ones in the game presented? Did it seem to be more real than a lecture/ tutorial/ scenario? Does the game facilitate discussion or acknowledgement of how decisions could be influenced by time, stress, patient opinion and the larger dental team? Did players pick up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters?	Put child protection into the context of the working day of a dental practice to facilitate reflection on previous experiences and attitudes thereby influencing future choices. Highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making. Introduce the game players to ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters, so that they can use this in their future professional decisions and lives	Playing the game will help participants reflect on their experiences of safeguarding/ child protection concerns and give them potential tools to use in these situations in the future. Participants will enjoy the game and it will make them think about their own concerns /anxieties/fears about potential cases and how to act despite competing pressures.

Including these three separate elements in the evaluation was a considered attempt to improve the rigour of the evaluation. The questionnaire used for both pre- and post- tests was piloted and tested for validity and reliability, again to improve the scientific rigour. In keeping with the literature concerning pre- and post- test questionnaires a Likert scale was chosen to evaluate learning outcomes. Pre-tests were distributed 2 weeks before the game play sessions. Game play sessions lasted approximately 60 minutes and were followed directly by the game experience questionnaire which had previously been validated and used for board games. Focus groups then immediately followed the game play sessions. The focus groups were planned so that there would be a maximum of 6 participants in a group and a maximum of 4 focus groups. Finally, post-tests were distributed to participants 6 weeks after playing the game. The game evaluation protocol which was submitted for approval can be found in Appendix 12 and is summarised in Figure 6.2.

Figure 6.2 Overview of Experimental Design protocol for Evaluation

A control group was considered but discounted for the evaluation due to the particular aspects of the game we wished to evaluate (game experience and focus groups) and resource (one researcher self-funded except for tuition fees) and time limitations of the PhD. Formal child protection training has been completed by the dental students' final year of undergraduate studies therefore it may have potentially been possible to give the pre- and post-test questionnaires to a control group of students in the same year group had time and recruitment numbers allowed. The focus groups and game experience questionnaires could not have had a control group as they required game play to

have occurred prior to answering the questions on the game experience questionnaire and the focus group topic guide. In future work it may be possible to have a control group has a tutorial related to child protection and a study group which plays the serious game as part of their tutorial.

In chapter 5 intended learning outcomes were discussed along with the relevant gameplay loops for each intended learning outcome and these were aligned to the evaluation questions as follows ILO 1 aligned to evaluation question 1, ILO 2 aligned to evaluation question 7, ILO 3 aligned to evaluation question 4, ILO 4 aligned to evaluation question 5 and ILO 5 aligned to evaluation question 6.

6.2.1 Evaluation Questions

1. Does the game have any impact on the attitudes of the participants?
    a. Does it change attitudes to reporting suspected cases?
    b. Does it make participants less fearful /anxious/ worried about reporting/ raising concerns?
    c. Does it make them feel more confident about reporting/ raising concerns?
2. Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible?
3. Does the game work as a co-operative game?
4. Does the game facilitate reflection on previous experiences?
5. Does the game facilitate consideration of what participants would do in real life if situations like the ones in the game presented?
    a. Did it seem to be more real than a lecture/ tutorial/ scenario?

6. Does the game facilitate discussion or acknowledgement of how decisions could be influenced by time, stress, patient opinion and the larger dental team?

7. Did players pick up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters?

6.2.1.1 Study Population for Evaluation

Final year dental students were chosen as the study population for the evaluation of the game because at this stage of their undergraduate studies they have completed all their formal undergraduate training in child protection. These dental students are future practitioners, and it was hoped that the game could be a novel way to approach both the topic and their current and future practice. Additionally, they were chosen due to ease of access to dental students as the researcher is a member of staff in Glasgow Dental Hospital & School. This meant the study could be completed in a timely manner without having to apply for further NHS research ethics approval which would have been required had we wished to evaluate the game with the dental teams in a dental practice setting. The game was, however, 'play tested' with dental team professionals attending the Scottish Dental Show in 2019.

There were limitations of using final year dental students as the evaluation study group as they have fewer years of experience compared to qualified dental team professionals and they have more support available to them. There have been no previous studies investigating whether the gap between suspicion and referral exists for undergraduate dental students as it does for qualified dental team professionals. It is impossible to say that the results would be directly applicable to qualified professionals who have more life experience and professional experience but the answers to the evaluation questions are still relevant as the dental students are future dental team professionals.

6.2.2 Evaluation Hypothesis

1. Playing the game will help participants reflect on their experiences of safeguarding/ child protection concerns and give them potential tools to use in these situations in the future.

2. Participants will enjoy the game and it will make them think about their own concerns /anxieties/fears about potential cases and how to act despite competing pressures.

6.3 **Ethical Approval for Evaluation**

A participant information leaflet (Appendix 13) and consent form (Appendix 14) were developed. The study was deemed not to require NHS ethics approval, but ethics approval was sought and granted from the Glasgow School of Art (Appendix 15) and from the School of Medicine, Veterinary and Life Sciences (MVLS) at Glasgow University. Permission was obtained from the Dean of Glasgow Dental School to run the study with the dental students (Appendix 16). The University of Glasgow accepted and endorsed the ethical approval from Glasgow School Art.

6.4 **Recruitment for Evaluation**

All final year dental students at Glasgow Dental School were invited to participate in playing the serious game under investigation. Participation was voluntary although it is recognised that as the researcher is a member of university staff there were ethical considerations of a dependent relationship (teacher-student). All potential participants were provided with a participant information leaflet prior to providing voluntary informed consent if they wished to take part in the research. There are normally between 70 and 80 students in final year at Glasgow Dental School. The aim was to recruit 12 to 24 students to participate in the evaluation (up to 6 can play the game at any time). Participants were free to withdraw at any time during the study duration. It was recognised that the timing of this research was an important ethical consideration because if the students were to express low levels of perceived confidence and knowledge then it could be distressing to them, and sufficient time should be made available to them to address their concerns between the

period of the research and their final BDS Objective Structure Clinical Examination (OSCE) examination which is acknowledged as a high stakes examination. For this reason, the evaluation study was scheduled at the beginning of the students' final year when all their formal teaching in child protection had been completed but there was still sufficient time to address any perceived concerns about confidence or knowledge regarding the subject. Participants were recruited by an email invitation sent to all the BDS 5 dental students.

6.4.1 Recruitment results

14 participants consented and took part over 4 play sessions. Participant numbers for each session are shown in Table 6.2. All play sessions were facilitated by the researcher. Recruitment numbers were lower than hoped for.

Table 6.2 Table of Participant numbers for each evaluation paly session

Session	Number of Players
1st	2
2nd	5
3rd	4
4th	3

13 pre-game questionnaires were completed.

14 game experience questionnaires were completed.

9 post game questionnaires were completed.

3 focus groups (2, 8, 3 participants respectively) were recorded and transcribed.

6.5 **Pre- and Post-Test Questionnaire**

6.5.1 Development of pre- and post-test questionnaire

To assess the participants attitudes it was necessary to use an attitudinal scale (as attitudes are cognitive rather than a physical phenomenon). A participant's

attitude to child protection/ safeguarding is not directly observable and therefore has to be assessed by self-report. The options for this scale were Thurstone, Likert and Semantic differential scales. We decided to use a Likert scale (Likert, 1932) as the researcher was familiar with this format and the participants would also be familiar with it. In addition Likert scales are commonly used in educational contexts (Norman, 2010). The high level construct (Brinkman, 2009) that we wished to investigate was the participants attitude to child protection in dentistry. In constructing the questionnaire to assess this we included indicators taken from the results of the in-depth questionnaires reported in Chapter 4, the learning outcomes relevant to child protection and safeguarding in the undergraduate dental curriculum in Glasgow Dental Hospital as well as relevant learning outcome from the General Dental Council Standards for Dental Professionals(General Dental Council, 2013) an Preparing for Practice (General Dental Council, 2015) documents. This resulted in a candidate list of 20 items for our questionnaire. The questionnaire (Appendix 17) was piloted with sixteen fourth year undergraduate dental students at Glasgow Dental School (students in the year below the evaluation sample).

6.5.1.1 Measurement and Scoring

The questionnaire (Appendix17) included 20 items rated from 1 (strongly disagree) to 5 (strongly agree). Scoring of the questionnaires was the summation of all 20 items with the minimum score being 20 and the maximum score being 100. Nine of the items (items 3, 4, 5, 6, 16, 17, 18, 19 and 20) were reverse scored as they were written in the negative. These questions were written in the negative deliberately as it is important in Likert questionnaires to have this balance in order to control for the acquiescence effect. Higher scores indicated a more positive attitude towards child protection/ safeguarding in dentistry.

6.5.1.2 Validity and Reliability

It is important for scientific rigour that the validity and reliability of the questionnaire instrument is investigated to assure that it is measuring what it is meant to measure (validity) and that it does so consistently (reliability). We needed to ensure that attitudes towards child abuse/neglect represented were

represented in and captured by the questionnaire. We assessed validity by content validity and face validity and assessed reliability by Cronbach's alpha.

6.5.1.2.1 Face validity

The pilot questionnaire (Appendix 17) including the 20 candidate items was distributed to sixteen fourth year dental students at Glasgow Dental Hospital & School. Senior undergraduate dental students were used for piloting and face validity as those reviewing the questions should come from the population of interest for the final questionnaire (Loewenthal et al., 2021). This included 5 questions regarding the face validity of the questionnaire as follows:

1. Are the name of questionnaire and the items asked acceptable?

2. Is the scale used acceptable?

3. Would this measure a person's attitude towards safeguarding and child protection?

4. Are any questions offensive, inappropriate to ask or irrelevant?

5. Are the questions clear?

All respondents (100%) agreed that name of questionnaire and items asked are acceptable, agreed that the scale used is acceptable, agreed that it would measure a person's attitude towards safeguarding and child protection, felt that no questions were offensive, inappropriate to ask or irrelevant, and agreed that all the questions are clear.

6.5.1.2.2 Reliability

Cronbach's alpha was calculated from the 16 pilot questionnaires and the results are shown in Table 6.3 and Table 6.4. Cronbach's alpha is 0.886 (over 0.8 is good) for the 20 candidate items in the pilot questionnaire. As mentioned previously nine of the questionnaire items (items 3, 4, 5, 6, 16, 17, 18, 19 and 20) were reverse scored as they were written in the negative. This indicated that the questionnaire had good reliability (it consistently measured participants attitude towards child protection in dentistry.

Table 6.3 Table of Cronbach's Alpha Result

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.886	.885	20

Table 6.4 Table of Item- Total Statistics showing what Cronbach's Alpha would be if Each Item was Removed

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
Q1	59.4000	76.686	.045	.	.893
Q2	60.0000	70.286	.593	.	.878
Q3	59.4000	74.686	.206	.	.889
Q4	60.0667	70.352	.569	.	.878
Q5	59.7333	67.352	.630	.	.876
Q6	59.9333	65.781	.728	.	.872
Q7	59.7333	70.495	.529	.	.879
Q8	59.4000	68.257	.586	.	.877
Q9	58.9333	71.067	.549	.	.879
Q10	59.2667	68.067	.656	.	.875
Q11	59.0667	71.638	.459	.	.881
Q12	59.0667	71.924	.523	.	.880
Q13	59.0667	71.781	.537	.	.880
Q14	58.7333	75.067	.393	.	.884
Q15	59.0667	71.781	.537	.	.880
Q16	60.9333	74.781	.217	.	.888
Q17	60.7333	74.781	.116	.	.895
Q18	59.6667	67.952	.562	.	.878
Q19	59.9333	63.352	.830	.	.867
Q20	59.8000	66.314	.742	.	.872

6.5.1.2.3 Content validity

To assess content validity the method first described by Lawshe (1975) which is commonly used to assess the content validity of questionnaire items was used. The candidate list of 20 questionnaire items based on General Dental Council Standards and previous in-depth interviews were sent to twenty experts (who were all working in paediatric dentistry and had experience of dealing with

questions around safeguarding and child protection) asking if they thought each individual item was “essential”, “useful but not essential” or “not necessary” in assessing attitudes towards safeguarding/ child protection concerns. Ten expert responses were received therefore giving Content Evaluation Panel size of ten.

Lawshe (1975) devised the Content Validity Ratio (CVR) to decide whether there is support for each item. The equation for is CVR = (n_e -N / 2) / (N / 2) where n_e is the number of experts that rated the item as “Essential”, and N is the size of the panel. This gives a number between -1 and 1 (0 means half the panel rated it as essential and the other half didn’t, a negative value means fewer than half of the panel rated the items as essential, and a positive value means more than half of the panel rated the items as essential). Therefore at least half of the experts on the panel should rate an item as ‘Essential’ for it to be deemed to have sufficient support. However, as Lawshe notes there will be some items for which “concurrence by members of the Content Evaluation Panel might reasonably have occurred through chance” and these items should be eliminated (Lawshe, 1975). Lawshe provides a table of the Critical content validity values for panels of different sizes. For a Content Evaluation Panel of ten members (as we had) the minimum CVR required for an item is 0.62. Brinkman (2009) put forward a critical number of experts on the panel that should deem an item is essential and associated CVR size which shows that for a panel of 10 the critical number of experts is 9 and the critical CVR is 0.8, this is also termed CVRstrict. They argue that only items that reach this critical value should be included in the final questionnaire. The results of our content validity questionnaire are presented in Table 6.5 where the numbers relate to numbers of experts rating as Essential, Useful, Not Necessary . The only item that reaches this critical value (CVRstrict) is “I am worried about getting things wrong if I suspected child abuse/ neglect”. We therefore also included the “Useful, but not essential” ratings to calculate the CVRrelaxed (Table 6.5) which suggested that four items, namely “I would find it easy to report a suspected case of physical child abuse”, “I would find it easy to report a suspected case of child neglect”, “I can act on my ethical responsibilities regarding child abuse /neglect” and “I fear my patient’s opinion of me” should be removed.

After discussion with the supervisory team the four items which did not meet CVRrelaxed were still included in the final questionnaire. This was because

elements of patient opinion were included in the game under the guise of “patient satisfaction” so it was felt that it was important that this should be included as part of the pre- and post-test. The item regarding acting on ethical responsibility was also included as it was hoped the game might improve the attitude towards action rather than just recognizing ethical responsibilities. The 2 items regarding ease of reporting were also still included in the final questionnaire but it was recognised that 3 and 4 members of the expert panel respectively (still less than half the panel) did not feel these were necessary in assessing attitudes towards child protection/ safeguarding concerns in dentistry. This was borne in mind when reporting the results of the final questionnaire.

Table 6.5 Table of Items for Content Validity with Associated CVR Strict and CVR relaxed scores

Item	Essential	Useful, but not essential	Not necessary	CVRstrict	CVRrelaxed
I would find it easy to report a suspected case of physical child abuse	5	2	3	0	0.4
I would find it easy to report a suspected case of child neglect	4	2	4	-0.2	0.2
I would find it difficult to report a suspected case of physical child abuse	8	2	0	0.6	1
I would find it difficult to report a suspected case of child neglect	7	3	0	0.4	1
I am fearful of reporting a suspected case of child abuse / neglect	4	5	1	-0.2	0.8
I am anxious about reporting a suspected case of child abuse/ neglect	4	5	1	-0.2	0.8
I am confident I would be able to report a suspected case of child abuse/ neglect	8	2	0	0.6	1
I am confident I would be able to refer a suspected case of child abuse / neglect appropriately	8	2	0	0.6	1
I am confident I can identify the signs of physical child abuse	8	1	1	0.6	0.8
I am confident I can identify the signs of child neglect	8	1	1	0.6	0.8
I am confident I know how to raise concerns about child abuse/ neglect	8	1	1	0.6	0.8
I am confident I can recognise my legal responsibilities regarding child abuse/ neglect	8	2	0	0.6	1
I am confident I can act on my legal responsibilities regarding child abuse/ neglect	8	1	1	0.6	0.8
I can recognise my ethical responsibilities regarding child abuse / neglect	5	4	1	0	0.8
I can act on my ethical responsibilities regarding child abuse /neglect	6	1	3	0.2	0.4
I am worried about getting things wrong if I suspected child abuse/ neglect	9	1	0	0.8	1
I am worried about missing cases of child abuse / neglect in my paediatric patients	7	3	0	0.4	1
I fear identifying suspected cases of child abuse/ neglect	4	6	0	0.2	1
I fear my patient's opinion of me	4	4	2	0.2	0.6
I am anxious about my patients' opinion of me	4	5	1	0.2	0.8

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6.5.1.2.4 Conclusions

The questionnaire has excellent face validity, good reliability and 16 of the 20 questionnaire items meet the content validity criteria. The 4 questions that did not meet the content validity criteria were still included as they were felt to be important aspects of the evaluation, but this must be borne in mind in the results of the final questionnaire. The minimum possible score for the questionnaire was 20 and the maximum score was 100 with nine of the questionnaire items (items 3, 4, 5, 6, 16, 17, 18, 19 and 20) reverse scored. Higher scores indicated a more positive attitude towards child protection/ safeguarding in dentistry.

6.5.2 Results of Pre- and Post-Test Questionnaire

6.5.2.1 Analysis

For the analysis of this work, we decided to report the sum of responses to the full set of questions. An item by item analytical approach would have been inappropriate because each individual item on the Likert scale is not a measure of the overall phenomenon of interest (attitudes towards safeguarding/ child protection concerns) and this type of analysis may cause statistical concerns through an inflation of Type 1 errors (Harpe, 2015). The attitude towards safeguarding/ child protection concerns is measured by an aggregated score on the full set of 20 items in the questionnaire (and this was what was validated) so this aggregated score must be used for analysis (Harpe, 2015). There is debate about the appropriateness of treating aggregated scales as continuous or ordinal data. Those that argue for the data to be treated as ordinal appear to overlook the difference between individual Likert items and overall Likert scales (Norman, 2010, Carifio and Perla, 2007). As we are reporting the sum of responses to the full set of questions the data is treated as continuous data (Harpe, 2015). Items 3, 4, 5, 6, 16, 17, 18, 19 and 20 on the questionnaire were reversed scored as they were deliberately written in the negative.

6.5.2.2 Pre-Test Results

13 Pre-test Questionnaires were completed.

Distribution of the pre-test data is seen in Figure 6.3 which shows a histogram of the number of respondents for each total sum of responses. There was a small number of respondents (n=13). The mean sum of responses to the Likert questionnaire was 58 (standard deviation =7) with a range of 48 to 67. The histogram demonstrates that despite the small number of responses they were approximately normally distributed.

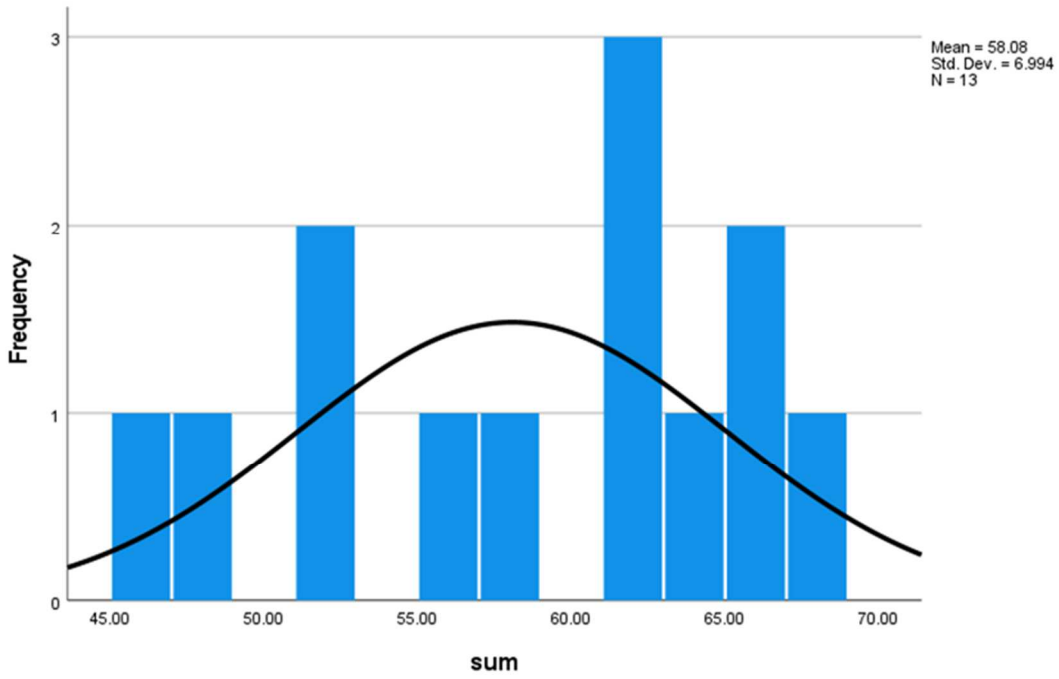


Figure 6.3 Histogram of Frequency of Total Sum of Responses to Pre-test Questionnaire. Data is approximately normally distributed but low number of respondents.

6.5.2.3 Post Test Results

9 Post-test questionnaires were completed.

Distribution of the pre-test data is seen in the histogram in Figure 6.4 which shows the frequency of total sum of responses to the Likert post- test questionnaire. There was a small number of respondents (n=9). The mean response to the Likert questionnaire was 58 (standard deviation =8) with a range of 48 to 67. Although there was a small number of respondents the histogram shows that the data is approximately normally distributed. As the minimum possible sum of responses was 20 and the maximum was 100 a mean of 58 suggests that attitudes towards child protection before playing the game were roughly neutral (neither positive nor negative).

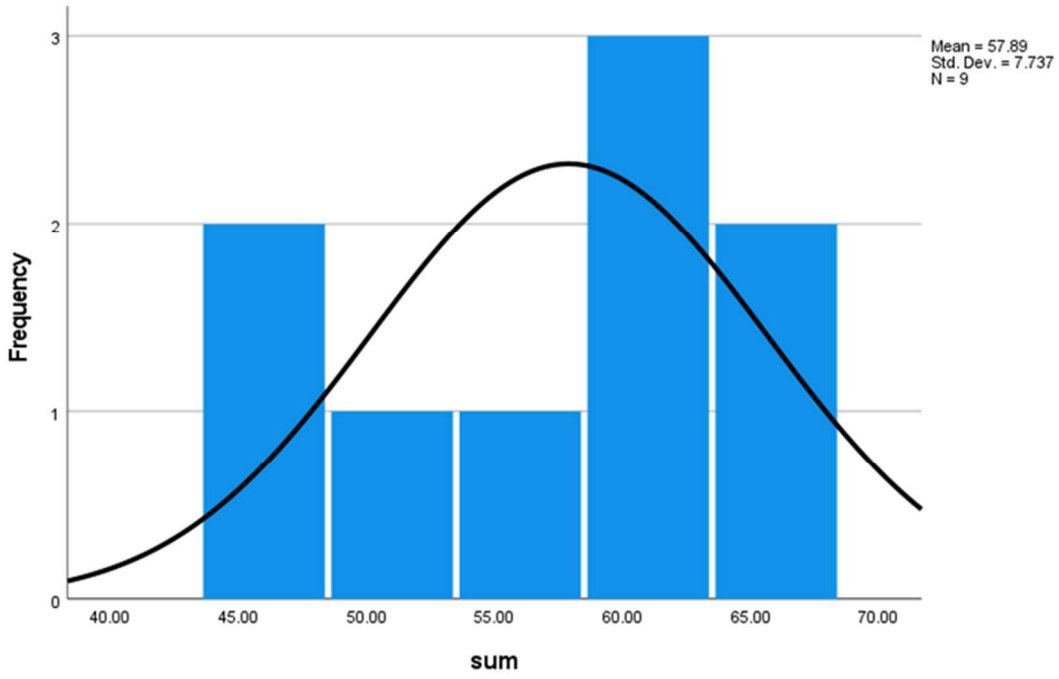


Figure 6.4 Histogram of Frequency of Total Sum of Responses to Post-test Questionnaire. Data is approximately normally distributed but low number of respondents.

6.5.2.4 Comparison of Pre-Test and Post-Test Data

The means and the ranges of the pre and post-test data were the same (mean =58, range 48-67). As mentioned before nine of the questionnaire items (items 3, 4, 5, 6, 16, 17, 18, 19 and 20) were reverse scored when calculating the total score as these were written in the negative. No difference was noted between the pre and post test results. The attitudes towards child protection/ safeguarding in dentistry were roughly neutral before playing the game and remained so after the game using the pre- and post- test method. The number of participants was small, and the groups are not a direct comparison (4 pre-testers did not complete a post-test). It is not surprising that with these small numbers there was no significant change in attitudes towards child protection/ safeguarding because of playing the game. Results may have been different had 4 questions that did not meet the CVRrelaxed threshold form the expert panel been removed. Despite the validation of the questionnaire the questions themselves may not be discriminative enough to detect a difference, especially in a small sample. It could be argued that as 4 participants did not complete a post-test questionnaire that comparison of the groups was not appropriate but as most individuals were the same it was still arguably useful. Future comparisons with this validated questionnaire should utilize some pseudo-anonymisation so

that if a participant does not complete the post-test questionnaire their data can be removed from the pre-test questionnaires so ensure the groups are directly comparable.

6.6 Game experience questionnaire

The game experience questionnaire (GEQ)(IJsselsteijn et al., 2013) was used to investigate whether the game is an enjoyable experience and show whether there any problems that could make the game unplayable, annoying, or impossible. It assesses game experience as scores on 7 components shown in Table 6.6 (IJsselsteijn et al., 2013, Poels et al., 2007).

Table 6.6 Definitions of component dimensions of GEQ

Component Dimension of GEQ	Definition
Competence	accomplishment, euphoria, pride, skilful, competent, good at it, successful, fast at reaching game's targets
Sensory and Imaginative Immersion	presence, absorbed in story, empathy, identification with game character, feeling imaginative, can explore things, aesthetically pleasing, game is impressive, feels like a rich experience
Flow	concentration, being absorbed, fully occupied with the game, loosing track of time, detachment/ forgetting everything around
Tension/Annoyance	annoyed, irritable, frustrated
Challenge	finding it hard, pressure, challenging, time pressure, exerting effort
Negative affect	bad mood, thinking about other things, tiresome, boring
Positive affect	feeling content, fun, happy, feeling good, enjoyable

The original GEQ consisted of 42 items across the 7 dimensions (Challenge, Competence, Flow, Immersion, Tension, Positive Affect and Negative Affect) and was a deliverable of the research project FUGA ("The Fun of Gaming")(Poels et al., 2007). One of the more commonly used versions of the GEQ is a 33 item version of the core module (which has the same 7 dimensions) which was

published in 2013 (IJsselsteijn et al., 2013). This publication also includes the in game GEQ, the social presence module and the post-game GEQ along with the scoring instructions for the 7 dimensions. The GEQ is was used because it is generally widely used in studies of games with varying genres (including teaching / training in healthcare) both in evaluating new games (Palee et al., 2020, Carvalho et al., 2019) and investigating commercially successful games (Pyae et al., 2017, Johnson et al., 2015). Of note it has already been used in the evaluation of a board game within healthcare (Bangalee et al., 2021). Although it has not be formally validated (Law et al., 2018) it is empirically and theoretically grounded (Poels et al., 2007). The empirical grounding of the GEQ involved focus groups which tested the comparison of scientific conceptualisations and lay descriptions of first-hand experiences of gamers (Poels et al., 2007) and the theoretical work to ensure it was based on current hypotheses was done by the partners in the FUGA research project(Poels et al., 2007). From a pragmatic view the GEQ was also free of charge to use. For these reasons it was included in this evaluation.

We used the 33 question version core module GEQ was along with the 17 question social presence module. Each of the 33 items comprise a statement about how the participants felt while playing the game which participants then rate as “Not at all” (0), “Slightly” (1), “Moderately” (2), “Fairly” (3) or “Extremely” (4). The way the 7 dimensions are spread over the 33 items in the version of the core module of the GEQ that was used is summarised in Table 6.7.

Table 6.7 Table Showing Which Items of the 33 Question Game Experience Questionnaire are Used to Calculate Each of the 7 Dimensions

Dimension	Numbered questionnaire items that make up the dimension
Competence	2, 10, 15, 17, 21
Sensory and Imaginative Immersion	3, 12, 18, 19, 27, 30
Flow	5, 13, 25, 28, 31
Tension/Annoyance	22, 24, 29
Challenge	11, 23, 26, 32, 33
Negative affect	7, 8, 9, 16
Positive affect	1, 4, 6, 14, 20

Generally, papers utilising the 33 item version of the GEQ present the mean rating plus the standard deviation and minimum / maximum scores for each dimension.

The 17-item social presence module of the GEQ comprises 17 statements about how the participants felt while playing the game and, like the core module, participants then rate them as “Not at all” (0), “Slightly” (1), “Moderately” (2), “Fairly” (3) or “Extremely” (4). The social presence module investigates psychological and behavioural involvement of the player with co-players which can be virtual (i.e., in-game characters), mediated (e.g., others playing online), or co-located (IJsselsteijn et al., 2013). In this evaluation study the co-players were the other players playing the board game at the same time. This was an important part of our evaluation as the desire for teamwork was a strong theme in out in-depth interviews (Chapter 4) and an important element of the design of the game (Chapter 5). There are 3 dimensions in the social presence module, namely “Psychological Involvement- Empathy”, “Psychological Involvement- Negative Feelings” and “Behavioural involvement”. The spread of these 3 dimensions across the 17-item module is shown in Table 6.8. For the game to be a successful co-operative board game it would be reasonable to expect that players would score moderately or higher for the “Psychological Involvement- Empathy” and “Behavioural Involvement” dimensions and have a lower score for the “Psychological Involvement- Negative Feelings”. As the game was designed to be cooperative a score of absolutely 0 for the “Psychological Involvement – Negative Feelings” would not be ideal as this element includes the influence of players moods on each other which would be reasonably expected when players are cooperating.

Table 6.8 Table Showing Which of the 17-Item Social Presence Module of the GEQ Make up the Score for Each of the 3 Dimensions

Dimension	Text of items that make up the dimension
Psychological Involvement – Empathy	I empathised with the others I felt connected to the others I found it enjoyable to be with the others When I was happy the others were happy When the others were happy I was happy I admired the others

Psychological Involvement – Negative Feelings	I felt jealous about the others I influenced the mood of the others I was influenced by the others moods I felt revengeful I felt schadenfreude (malicious delight)
Behavioural Involvement	My actions depended on the others actions The others actions were dependent on my actions The others paid close attention to me I paid close attention to the others What the others did affected what I did What I did affected what the others did

6.6.1 Results of Game Experience Questionnaire

All 14 of the participants completed the core module and the social presence module of the GEQ. The results of the core module are reported in section 6.6.11 and results of the social presence module in section 6.6.1.2. The core module results give an indication of whether the game is an enjoyable experience and show whether there any problems that could make the game unplayable, annoying, or impossible. The social presence module gives an indication of the psychological and behavioural involvement of the players with their co- players.

6.6.1.1 Results of the Core Module of the GEQ

One participant did not answer question 26 of the core module (statement "I felt challenged") but all other questions were fully completed. The missing component meant that the "challenge" component could not be calculated for this participant, so this participant was excluded from the calculation of the overall mean for this dimension (hence n=13 for the Challenge dimension and N=14 for all other dimensions). The mean scores for each of the component 7 dimensions in the core game experience questionnaire are shown in Table 6.9 with the associated standard deviation (s.d) and minimum (min) and maximum (max) values for each component and the scores for each dimension for each

participant are shown in Table 6.10. The results show that the game scored moderately to fairly for the competence and sensory and imaginative immersion dimensions, moderately for the flow dimension, not at all for the tension/ annoyance and negative affect dimensions, slightly for the challenge dimension, and fairly for the positive affect dimension.

Table 6.9 Table of Overall Mean Scores for the 7 Dimensions of the GEQ Core Module

Dimension	Mean (s.d)	Min	Max
Competence	2.6 (0.6)	1.0	3.6
Sensory and Imaginative Immersion	2.9 (0.7)	1.3	3.7
Flow	2.1 (0.8)	1.0	3.6
Tension/Annoyance	0.0 (0.0)	0.0	0.0
Challenge	1.0 (0.6)	0.4	2.4
Negative affect	0.4 (0.6)	0.0	1.5
Positive affect	3.2 (0.6)	1.4	4.0

Table 6.10 Table of Each Participants Scores in the 7 Dimensions of the GEQ Core Module

Participant number	Competence	Sensory and Imaginative Immersion	Flow	Tension/ Annoyance	Challenge	Negative affect	Positive affect
1	3.2	3.0	1.6	0	0.4	0	3.8
2	3.2	2.7	1.8	0	0.8	0	3.2
3	3.0	3.7	2.0	0	0.4	0	3.2
4	3.0	3.2	3.2	0	2.4	0	4.0
5	1.0	1.3	1.0	0	0.4	1.5	1.4
6	2.6	3.2	2.6	0	0.6	0	3.2
7	2.4	2.8	2.6	0	0.6	0.3	3.2
8	2.6	3.3	2.8	0	1.2	0.3	3.2
9	2.4	2.8	2.2	0	n/a	0	3.4
10	2.6	2.8	2.0	0	1.0	0.8	3.4
11	2.4	3.5	1.6	0	1.2	0.3	3.4
12	2.2	1.3	1.2	0	1.2	1.5	2.6
13	2.6	2.8	1.2	0	0.8	0.3	3.2
14	3.6	3.7	3.6	0	2.0	1.0	4.0

6.6.1.2 Results of the Social Presence Module of the GEQ

All 14 participants answered all 17 items of the social module of the game experience questionnaire. The mean scores for each of the 3 dimensions in the social presence module of the GEQ are shown in Table 6.11 with the associated s.d, min, and max values. The scores for the 3 dimensions for each participant are shown in Table 6.12. From the mean overall scores the game scores moderately to fairly for the "Psychological Involvement- Empathy" and

"Behavioural Involvement" and not at all to slightly for the "Psychological Involvement- Negative Feelings". All the scores for the "Psychological Involvement- Negative Feelings" came from the jealousy and mood influencing elements of this dimension (Table 6.8) with no players reporting any feelings of revengefulness or schadenfreude.

Table 6.11 Table of Overall Mean Scores for the 3 Dimensions of the GEQ Social Presence Module

Dimension	Mean (s.d)	Min	Max
Psychological Involvement – Empathy	2.8 (0.6)	1.5	4.0
Psychological Involvement – Negative Feelings	0.9 (0.5)	0.4	1.6
Behavioural Involvement	2.5 (0.6)	1.5	3.7

Table 6.12 Table of Each Participants Scores in the 3 Dimensions of the GEQ Social Presence Module

Participant number	Psychological Involvement – Empathy	Psychological Involvement – Negative Feelings	Behavioural Involvement
1	3.3	0.4	2.7
2	3.3	1.6	3.7
3	3.0	1.2	3.3
4	2.7	0.4	1.7
5	1.5	0.4	1.5
6	3.0	0.8	3.0
7	2.5	0.8	2.7
8	3.0	1.0	2.0
9	3.3	0.4	2.0
10	2.8	0.4	2.5
11	2.2	1.2	2.3
12	2.2	1.6	2.5
13	2.3	0.8	2.3
14	4.0	1.6	3.0

6.6.2 Conclusion of the Results of the GEQ

In conclusion the results from the core module of the GEQ suggest the game is playable and does not offer a negative or annoying experience that would hamper the evaluation and serious game approach. The results from the social presence module of the GEQ suggest the game works as a co-operative game with players being involved psychologically and behaviourally with each other. These results are descriptive only but are informative. We are cautious about undertaking any statistical analysis on this small sample size.

6.7 **Focus Groups**

Focus groups were an important part of the evaluation process as the games purpose was to put child protection into the context of the working day of a dental practice (to facilitate reflection on previous experiences and attitudes thereby influencing future choices), highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making and introduce the game players to ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters (so that they can use this in their future professional decisions and lives). The evaluation questions that the focus groups were used to answer (Section 6.2.1) were questions 2, 4, 5, 5a, and 6 namely:

Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible? (Evaluation question 2)

Does the game facilitate reflection on previous experiences? (Evaluation question 4)

Does the game facilitate consideration of what participants would do in real life if situations like the ones in the game presented? (Evaluation question 5)

Did the game seem to be more real than a lecture/ tutorial/ scenario? (Evaluation question 5a)

Does the game facilitate discussion or acknowledgement of how decisions could be influenced by time, stress, patient opinion and the larger dental team? (Evaluation question 6).

Did players pick up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters? (Evaluation question 7)

It was also noted that qualitative evaluation is especially useful for identifying unintended consequences and side effects (Patton, 2015).

Three separate focus groups interviews were completed, and the details of each group are summarised in Table 6.13. A focus group topic guide was constructed (Appendix 18) and followed during each focus group. There was a very small number in focus group 1 and a much larger group in focus group 2. Ideally it would have been better to split the group sizes more evenly, but this was not possible due to the availability of the participants.

Table 6.13 Table Detailing Composition of Focus Groups for Evaluation

Focus Group	No of participants	Composition	Duration of focus group
1	2	1 male 1 female	29 min 44 sec
2	8	2 male 6 female	30 min 32 sec
3	3	1 male 2 female	19 min 13 sec

The focus groups were transcribed verbatim by the researcher following the same conventions as discussed in section 3.4.2.9 of chapter 3 and summarised in table 3.5. Transcriptions can be found in Appendix 19. Thematic analysis of the focus groups was done as described for the in-depth interviews in Chapter 4 Section 4.1.1 and is summarised in Figure 6.5.

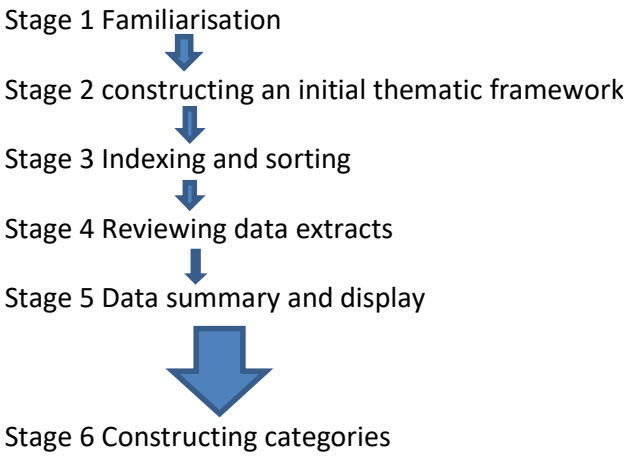


Figure 6.5 Summary diagram of Thematic Analysis Technique used for Focus Group Evaluation

During the familiarisation stage (stage 1) all focus group transcripts were reviewed and recordings listened to and potential topics of interest that appeared recurrent across the data set and relevant to the evaluation of the game were recorded. This resulted in an initial list of potential topics (Appendix 20) which was then rationalised and structured into an overall thematic framework (stage 2). The list was rationalised by checking it against the objectives of the evaluation to see if it was relevant and resulted in an initial thematic framework (Figure 6.6.) in which the items on the initial list (appendix 20) were grouped together and sorted into different themes and subthemes. This resulted in eight main themes with nested subthemes. This is close to what is generally reported in qualitative research where five to seven main themes are generally identified during the initial coding (Saldana 2009).

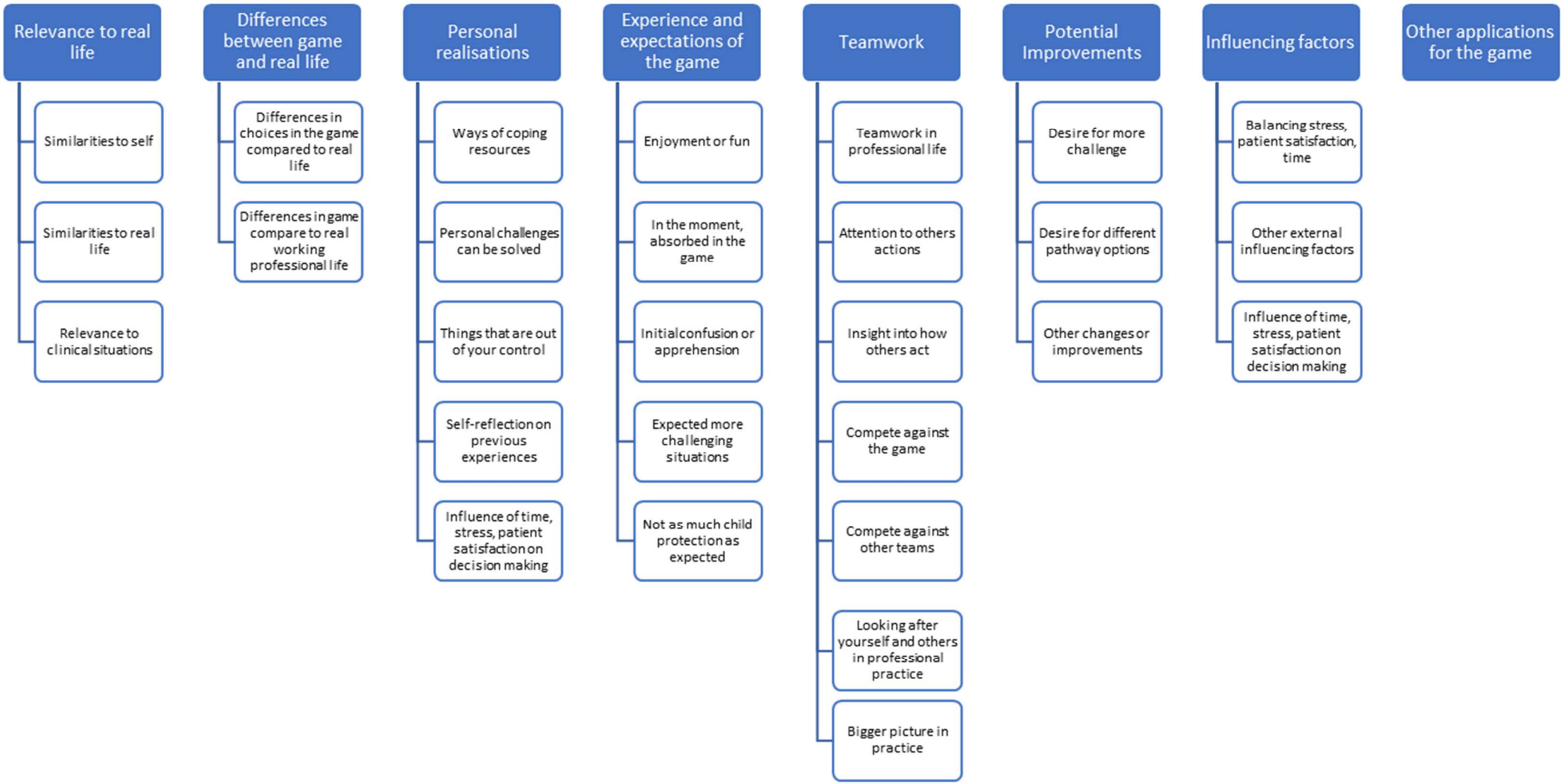


Figure 6.6 Initial Thematic Framework for Focus Group Evaluation

The contents of the thematic framework were then entered into NVivo 12 as the "Nodes". The thematic framework was applied to the transcripts of the focus groups to identify where the different themes were being discussed (stage 3). This was the indexing stage of data analysis (Richards and Richards 1994, Seale 1999, Ritchie 2014). The data from the focus group transcripts was then sorted so that all the material in each theme and subtheme could be viewed at once. Each theme and subtheme were addressed individually to create corresponding thematic sets to allow an intense review of the data contained in each theme and subtheme (stage 4). Some data was sorted to more than one thematic set (as it was relevant to different subjects). The thematic sets were reviewed to assess how coherent the data extracts were. In addition, the small sections of the focus group transcripts that had not been indexed were re-examined to see whether any important themes had been missed from the thematic framework. Only very small sections of the focus groups had not been indexed and no important themes appeared to have been missed in these sections. At this stage it was noted that no data had been coded to the subthemes of "Balancing stress, patient satisfaction, time" and "Other external influencing factors" in the "Influencing Factors" theme so this theme was reduced to the main theme of "Influencing factors" and the subthemes merged into this.

Framework matrices (stage 5) were then constructed for each of the eight main themes in turn (Relevance to real life, Differences between game and real life, Personal realisations, Experience and expectations of the game, Teamwork, Potential Improvements, Influencing factors, Other applications for the game). In each matrix each subtheme had its own vertical column and each case (in this case 13 cases for the 13 total participants in the focus groups) was in a separate row which was in the same position across all the matrices. Where there were empty cells for participants the other members of the focus group were looked at to see if the relevant theme had been discussed in the focus group but by other participants. Where it was identified that a theme, or subtheme had not been discussed in a focus group the transcript was reviewed to see if any themes had been missed. This process showed that all main themes except for "Influencing factors" (which was noted in 2 out of 3 focus groups) were discussed in all 3 focus groups. There were 12 subthemes which were not coded as being discussed in all the focus groups. These are shown in Table 6.14. The

focus group transcripts were re-examined to see if any relevant data had been overlooked or the themes/subthemes were indeed missing. This resulted in only 5 subthemes being noted as not discussed in every focus group, and indeed there was only 1 focus group for each of these subthemes where they did not appear in the discussion, this demonstrated the value of being thorough with the framework matrices and re-examining the transcripts looking for each theme individually.

Table 6.14 Table of Themes and Subthemes Showing Where They Were Missing from Focus Group Data

Theme	Subtheme	Theme covered in all FGs (focus groups)?	Coded on further review of data?
1. Relevance to real life	Similarities to self	Yes	N/A
	Similarities to real life	Yes	N/A
	Relevance to Clinical Situations	Yes	N/A
2. Differences between game and real life	Difference in choices in game compared to real life	Yes	N/A
	Differences in game compared to real working professional life	No, missing from FG 3	No
3. Personal realisations	Ways of coping resources	Yes	N/A
	Personal challenges can be solved.	No, missing from FG 2	Yes
	Things that are out of your control	No, missing from FG 2	Yes
	Self-reflection on previous experiences	Yes	N/A
	Influence of time, stress, patient satisfaction on decision making	Yes	N/A
4.Experience and expectations of the game	Enjoyment or fun	Yes	N/A
	In the moment absorbed in the game	No, missing from FGs 2 & 3	Yes
	Initial confusion or apprehension	Yes	N/A
	Expected more challenging situations.	No, missing from FGs 1 & 3	No. Discussed in FG 1 but not discussed in FG 3
	Not as much child protection as expected.	No, missing from FG 3	No
5. Teamwork	Teamwork in professional life	Yes	N/A
	Attention to others' actions.	No, missing from FG 1	Yes
	Insight into how others act.	No, missing from FG 2	Yes
	Compete against the game.	No, missing from FGs 1 & 3	Yes
	Compete against other teams.	No, missing from FG 1	No
	Looking after yourself and others in professional practice	Yes	N/A
	Bigger picture in practice	Yes	N/A
6. Potential Improvements	Desire for more challenge	Yes	N/A
	Desire for different pathway options	No, missing from FGs 1 & 3	No. Discussed in FG 1 but not discussed in FG 3
	Other changes or improvements	No, missing from FGs 1 & 3	Yes
7. Influencing factors		No, missing from FG 3	Yes
8. Other applications for the game		Yes	N/A

All of the data from each participant in each of the relevant subthemes in these 5 themes was reviewed noting the range of perceptions, views and experiences which had been labelled as part of the theme (Ritchie, 2013). The elements present were listed then grouped and sorted by the key underlying dimensions. The dimensions and categories for each theme and subtheme are seen in Table 6.16. The subthemes of "ways of coping" and "personal challenges can be overcome" from Theme 3 (Personal realisations) were combined as "dealing with challenges" as they had similar underlying dimensions and categories. The subthemes of "Teamwork in professional life", "Attention to others actions" and "Insight into how others act" from Theme 5 (Teamwork) were combined as "Teamwork in practice" as they also had similar underlying dimensions and categories.

Table 6.15 Table Summarising the Evaluation Questions and the Themes (and Subthemes) which Contained Data that Answered the Question

Evaluation Question	Relevant themes (subthemes)
Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible? (Evaluation question 2)	Theme 4-Experience and expectations of the game (Enjoyment or fun, Initial confusion or apprehension)
Does the game facilitate reflection on previous experiences? (Evaluation question 4)	Theme 3- Personal Realisations (Self-reflection on previous experiences)
Does the game facilitate consideration of what participants would do in real life if situations like the ones in the game presented? (Evaluation question 5)	Theme 1- Relevance to real life (Similarities to real life, Relevance to Clinical Situations)
Did the game seem to be more real than a lecture/ tutorial/ scenario? (Evaluation question 5a)	Theme 1- Relevance to real life
Does the game facilitate discussion or acknowledgement of how decisions could be influenced by time, stress, patient opinion and the larger dental team? (Evaluation question 6).	Theme 3- Personal Realisations (Influence of time, stress, patient satisfaction on decision making) Theme 5- Teamwork (Teamwork in professional life, Attention to others' actions, Insight into how others act) Theme 7- Influencing Factors
Did players pick up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters? (Evaluation question 7)	Theme 3- Personal Realisations (Ways of coping resources, Personal challenges can be solved, Things that are out of your control)

Table 6.16 Table of Underlying Dimensions and Categories in each Theme and Subtheme

Theme	Subtheme		Dimension	Categories
Theme 1- Relevance to Real Life	Similarities to self		Personality traits like characters	Want patients to like them Focussing on weaknesses not strengths Worried about difficult procedures Difficulties in asking for help or referring
	Similarities to real life		Variation	Strengths and weaknesses- in personalities, in abilities, as they affect the team Options (treat/refer/review) In stress- between characters, situations and micro-stresses In patients- the randomness, typical, have to deal with anything
	Relevance to clinical situations		Daily working life	Scenarios- routine, rare, tough, potential huge variety Adapting- plans change, choices affect others Time pressure Stress builds
Theme 3- Personal Realisations	Ways of coping resources Personal Challenges can be solved	Dealing with challenges	Identifying useful resources and how to improve	Character resources relevant to participants- training courses, challenge worksheets, resilience, well rested Need for constructive reflection Looking after own wellbeing Asking for help
	Things that are out of your control		Need for reflexivity	Being prepared for the unexpected Things can go better or worse
	Self- reflection on previous experience		Strengths and weaknesses	Reflection on personal and professional experiences- reduces anxiety, need for constructive reflection, what they would do in future
	Influence of time, stress, patient satisfaction on decision making		Pressure	Hard to save time, different procedures take up different time, need to keep eye on the clock Stress slowly builds, affects decisions and time management Watching how others are doing too

Theme 4- Experience and expectations of the game	Enjoyment or fun		Elements that added enjoyment	Simplicity Relevance Able to follow rules and steps Variety of patients Ability to try different characters Ability to place self in scenarios Unexpected events added excitement Good visualisation Feeling of playing as a team Different rounds added challenge
	Initial confusion or apprehension		Elements that caused confusion/apprehension	Appeared complicated Not realising can play more than 1 treatment card Unsure of aim initially Confusing which resources to play
Theme 5- Teamwork	Teamwork in professional life	Teamwork in practice	Awareness of self and others	Listening and learning from others Importance of knowing your team- strengths and weaknesses, what is happening to them Discussion of opinions and decisions Offering and asking for help Not competing Comparison to others to improve self
	Attention to others actions			
	Insight into how others act			
Theme 7- Influencing factors			Pressure	Time pressure Concern about self and rest of team maxing out for time/ stress/patient satisfaction Making appropriate decisions rather than ones that allow “survival” Balancing time/ stress/ patient satisfaction

6.7.1 Results from Focus groups

Evaluation Question 2- Is the game an enjoyable experience and are there any problems that could make the game unplayable, annoying, or impossible?

The participants in the focus groups found the game fun. They discussed various aspects of the game that made it an enjoyable experience including the simplicity of the game, that it was relevant to them, they were able to follow the rules and steps, the variety of patients was fun, and they were able to try out different characters. The also mentioned the ability to place themself in the scenarios was enjoyable and the unexpected events (from the "event cards") added excitement. Participants discussed that the visualisation of stress levels, patient satisfaction levels and time was good and helped make the game fun. They enjoyed the feeling of playing as a team and that the different rounds added challenge.

The game was criticised for appearing complicated and that participants did not initially know what the aim of the game was. They mentioned not being aware they could play more than one treatment card initially and being confused as to which resource cards to play but no other problems were mentioned.

Evaluation question 4- Does the game facilitate reflection on previous experiences?

Participants reported reflecting on personal and professional experiences during the game with the underlying dimension of discussing this in terms of strengths and weaknesses. They reported that the game reduces anxiety about future experiences, highlighted the need for constructive reflection and made them consider what they would do in future when faced with similar situations.

Evaluation question 5- Does the game facilitate consideration of what participants would do in real life if situations like the ones in the game presented?

Participants discussed that the game had relevance to real life situation in that there was a lot of variation. They reported the variation in strengths and weaknesses in personalities, in abilities, and how this variation affects the team to be things that were relevant to real life. They reported the variety of options (treat/refer/review) to be relevant and were representative of what would do in real life. The variation of stress levels (between characters, situations and micro-stresses) was also discussed as things they would take into account in real life situations. Participants reported that the randomness and potential huge variety as to which patients and scenarios they got in the game made them consider many aspects of real -life and clinical situations as the representation of patient and scenarios covered the typical/ routine as well as the rare and difficult and the need to be able to deal with anything. In discussing the relevance of the game to clinical situations the main underlying dimension was of aspects of their daily working life and the need to adapt (plans change, choices affect others) as well as time pressure and building stress which they would consider in real life situations.

Evaluation question 5a- Did the game seem to be more real than a lecture/ tutorial/ scenario?

Although this question was not asked directly participants discussed the relevance of the game to real life clinical scenarios and reported being absorbed in the game. The different aspects of real life and clinical situations that were discussed provides some evidence that the experience of playing the game felt real, however this was not directly compared to lectures/ tutorials or scenarios.

Evaluation question 6- Does the game facilitate discussion or acknowledgement of how decisions could be influenced by time, stress, patient opinion and the larger dental team?

The discussion of factors that could influence decisions was noted in in the Theme 5- teamwork where participants talked about discussing opinions and decisions. Theme 3- Personal Realisations (Influence of time, stress, patient satisfaction on decision making). In Theme 3- Personal realisations they talked about different aspects of this with the underlying dimensions of pressure they talked about time (hard to save time, different procedures take up different

amounts of time, need to keep eye on the clock), stress (stress slowly builds, affects decisions and time management) and that watching how others are doing is also a factor in their decision making. Participants also discussed “Influencing Factors” as a main theme with the underlying theme of this again being pressure with time pressure and concern about themselves and the rest of team maxing out for time/ stress/patient satisfaction. They discussed that this affects their decisions in that they are still trying to make appropriate decisions rather than ones that allow “survival”. They expressed that decisions are influenced by balancing time/ stress/ patient satisfaction in the game.

Evaluation question 7- Did players pick up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters?

Participants did discuss this in Theme 3- Personal realisations where the main underlying dimension was about identifying useful resources and how to improve themselves. They discussed that the Character resources were relevant to them and picked out training courses, challenge worksheets, resilience and being well rested as particular resources they would find useful or keep in mind for the future. They also discussed the need for constructive self-reflection, the importance of looking after their own wellbeing and of asking for help. Additionally, when discussing the subtheme of “things that are out of your control” there was an underlying dimension of reflexivity where being prepared for the unexpected and remembering that things can go better or worse were noted.

6.7.2 Conclusion of Results from Focus Groups

The focus groups provided rich data and evidence that the game was an enjoyable experience with no major issues that made it unplayable. There was some limited evidence that it felt real to the participants and was certainly relevant to real-life and clinical situations. There was a lot of discussion in the focus groups about how the different influencing factors affected decisions, so the game appears successful in this respect. Participants reported that the game reduces anxiety about future experiences, highlighted the need for constructive reflection and made them consider what they would do in future when faced

with similar situations. The participants also picked up on ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters.

6.8 Discussion of Evaluation Results

There is a lack of consensus about key analysis factors for evaluation serious games (Abdellatif et al., 2018, Connolly et al., 2012, Calderón and Ruiz, 2015). Questionnaires are the most common technique used to evaluate serious games with the Likert scale as the preferred method(Calderón and Ruiz, 2015, Connolly et al., 2012). Interviews are the second most used technique (Connolly et al., 2012, Calderón and Ruiz, 2015).This evaluation used pre- and post-test questionnaires, the GEQ and focus groups to improve rigour. The Likert questionnaire we developed assessed attitudes rather than knowledge as the purpose of the game and the pre and post-test results were similar. This may be because the pre-test results were relatively high, or it may be due to the small sample size being unable to detect a relatively small change in attitudes. It is acknowledged that attitudinal change is harder to assess and requires more longitudinal follow up which would be useful but not possible due to the time constraints of doctoral research. Additionally, it can be argued that to see real proof that the serious game has a benefit over the standard teaching and training in child protection further research is required comparing a group who received standard training to those who play the game as part of their training. This will be considered for future work but was not possible during the period of doctoral study.

The results from the core module of the GEQ suggest the game is playable and does not offer a negative or annoying experience that would hamper the evaluation and serious game approach. The results from the social presence module of the GEQ suggest the game works as a co-operative game with players being involved psychologically and behaviourally with each other. It is difficult to compare these results with the results of the GEQ from other published games with supporting literature due to the wide variation in how the results from the GEQ are presented and that many published research papers which use the GEQ have modified the GEQ in some way. The purpose of using the core module of the GEQ in this research was to ensure that the game was playable and did not

offer a negative experience that would hamper the overall approach or, indeed the rest of the evaluation. In this respect the game scored moderately to fairly for the competence and sensory and imaginative immersion dimensions, moderately for the flow dimension, not at all for the tension/ annoyance and negative affect dimensions, slightly for the challenge dimension, and fairly for the positive affect dimension which shows that it was indeed playable with no negative experiences. The purpose of including the social presence module of the GEQ was to check that it worked as a co-operative game. The game scored moderately to fairly for the "Psychological Involvement- Empathy" and "Behavioural Involvement" of the social presence module and not at all to slightly for the "Psychological Involvement- Negative Feelings" which suggests it does work as a co-operative game.

The results from the focus groups provided rich data to answer the evaluation questions and provided answers to the questions which were picked up in the main themes Relevance to Real Life, Personal Realisations, Experience and expectations of the game, Teamwork and Influencing factors. The audit trail is shown in the results and verbatim transcriptions found in Appendix 17 so that the process is as transparent as possible. As noted previously there are challenges in evaluating serious games, especially for assessment of change in attitudes, beliefs, behaviours, and in complex topics. Qualitative evaluation is therefore useful as it provides rich data of the participants experiences and helps to triangulate results from the pre- and post-test questionnaires and the GEQ. Importantly the results from the focus groups showed that the game reduces anxiety about future experiences, highlights the need for constructive reflection and made participants consider what they would do in future when faced with similar situations. Participants also reported that the game had relevance to real life situations.

6.9 **Evaluation Summary**

The overall main research question was "What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?" and this evaluation aimed to answer the second part of this question, namely can a serious game provide an effective support for training in child protection?

The game had been designed with 3 main purposes and the pre- and post-test questionnaires, game experience questionnaire and focus groups have all provided evidence that the game has been successful in its 3 main purposes, namely:

1. Put child protection into the context of the working day of a dental practice in order to facilitate reflection on previous experiences and attitudes thereby influencing future choices.

2. Highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making.

3. Introduce the game players to ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters, so that they can use this in their future professional decisions and lives.

There is evidence from the evaluation that the serious game can provide an effective support for training in child protection as it has been successful in its 3 main purposes.

We hypothesised that the game would help participants reflect on their experiences of safeguarding/ child protection concerns and give them potential tools to use in these situations in the future and the evaluation has shown evidence of this.

Participants enjoyed the game and it made them think about their own concerns /anxieties/ fears about potential cases and how to act despite competing pressures which is what we hypothesised it would do.

Chapter 7 Conclusion and Recommendations for Future Work

7.1 Conclusion

The research question for this thesis was “What factors affect referral of child protection concerns by dental team professionals and can a serious game provide an effective support for training in this subject?”

This thesis has offered a methodical investigation of the factors affecting referral of child protection concerns by dental team professionals and the conceptualisation and development of a serious game. The aim of this research was to investigate the factors that affected referral and whether a serious game intervention could provide an effective support for child protection/ safeguarding training for dental team professionals. The preceding chapters have shown this is indeed the case and the conclusions are summarised in this chapter. This research included the first qualitative in-depth interviews with dental team professionals in Scotland and was aimed at understanding the reality of their professional lives regarding child protection concerns. The research also included the design, development, and evaluation of a serious game for use in the training and teaching of child protection to dental team professionals which has not previously been reported in the literature.

A persistent gap between the proportions of dental team professionals that suspect abuse or neglect in their paediatric patients and those who refer for appropriate help was identified in the literature. This was noted to be a global issue and, in fact, was not limited to dental team professionals. Other healthcare and education professionals were also identified as not always referring cases of suspected child abuse or neglect.

The main barriers to referral for dental team professionals were broadly grouped into uncertainties (about the diagnosis or procedures), fears (of making the wrong diagnosis, of violence to the child or dental team professional) and lack of knowledge (of referral procedures). We explained that these barriers must be overcome because child abuse and neglect have significant short- and long-term effects on the victims as well as their wider societal circumstances and early

identification leading to the correct help for children and young people can minimize these negative effects.

We identified that there are many different factors that affect how dental team professionals chose their CPD topics. In the UK safeguarding of children is a recommended CPD topic but to encourage uptake of CPD in this area training needs to be convenient, not too costly and be a topic that is easily discussed with colleagues.

Serious Games enable interactive and cognitive engagement with content. They can have a major role in education for areas of the curriculum that require engagement and reflection. Matching the game mechanics to specific learning outcomes is key to serious game development. There are many serious games in the field of health, but none have been reported that are targeted at dental professionals, and currently none could be found that have areas of child protection as their subject or that attempt to address the fears of dental team professionals in their professional lives. Various significant barriers to referral had previously been identified in the literature and in-depth qualitative interviews were undertaken with dental team professionals in Scotland to understand the reality more thoroughly for them around this subject. One of the over-arching themes from these interviews was fear and so a serious game was developed through a Learning Mechanics-Game Mechanics (Arnab et al., 2015) approach and incorporated elements of cognitive behaviour therapy to address some of the elements of fear. The game aimed to:

1. Put child protection into the context of the working day of a dental practice in order to facilitate reflection on previous experiences and attitudes, thereby influencing future choices.

2. Highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making.

3. Introduce the game players to ways of coping with or managing the personality traits or elements of disordered thinking that they may have in common with the game characters, so that they can use this experience in their future professional decisions and lives

The game was evaluated with final year dental students at Glasgow Dental Hospital and School through pre- and post-test questionnaires, the game experience questionnaire and focus groups, and was found to be successful in its aims.

The Learning Mechanics- Game Mechanics model (Arnab et al., 2015) was helpful, and in fact, integral to this project as the researcher was not used to game design but was familiar with intended learning outcomes. The LM-GM model made clear how ILOs can be integrated into a game and linked with game mechanics. The LM- GM model has been "designed to allow different users to describe games on the basis of different pedagogical approaches" and "allow users to freely relate learning and gaming mechanics" (Arnab et al., 2015) to describe serious game situations. In this research project LM-GM was used to identify which learning mechanics and game mechanics would be used and for expressing their dynamic relationships through the Gameplay Loops (Chapter 5, Section 5.3.1). Arnab et al (2015) argue that LM-GM can be used to aid serious game design and can be used by domain experts (rather than only game designers) interested in developing serious games and this project is certainly an example of that. The most challenging aspect of using LM-GM was making the decision on the most suitable learning mechanics for each ILO as there were several learning mechanics that had the potential to be useful or pertinent.

7.1.1 Were the Objectives Met?

There were 5 main objectives for this research project, and they have all been met as summarised in this section.

Objective 1 was to thoroughly investigate the factors related to referral of child protection concerns by dental teams in Scotland and prioritise them (Chapters 2, 3 and 4). This was completed successfully and provided important information including that the main factors that were barriers to the referral of child protection concerns by dental team professionals in the literature fears, uncertainties, and lack of knowledge. This fed into the in-depth interviews that were undertaken with dental team professionals in Scotland which allowed us to identify that an overarching theme of fear was present, and this was the priority barrier to be targeted. This was the foundation of the world of reality from the

triadic game design (Harteveld, 2010). This approach to understanding the barriers for dental team professionals in Scotland had not previously been reported.

Objective 2 was to understand the issues from the perspective of dental team professionals practicing in Scotland (Chapters 3 and 4). In-depth interviews were completed and provided information around the issues involved in the referral of concerns about child abuse and neglect. Through purposive sampling 18 dental team professionals who represented both dentists and dental care professionals from 6 Scottish health boards were interviewed. The interviews allowed a thorough exploration of the issues involved and identified how important fear was as an issue in the professional's reality. This type of investigation of this topic had never been undertaken with Scottish dental teams before and brought a new understanding to the issues that they face in their professional and personal lives when it comes to experiences of concerns about child abuse and neglect.

Objective 3 was to investigate suitable pedagogic practices for approaching and intervening in these factors (Chapter 2). After exploring potential pedagogic practices, a social constructivism approach including inquiry based, collaborative and reflective learning was identified as appropriate. A serious game approach can be inquiry-based, collaborative and supportive of reflective learning. No evidence from the current literature was found of this approach having been used to address this topic previously.

Objective 4 was to investigate and develop a serious game approach to support the delivery of teaching and training in child protection/ safeguarding to dental professionals based on the evidence gathered in objective 1 (Chapter 5). A table top game was developed to address fear about referral of concerns regarding child abuse and neglect through the inclusion of elements of cognitive behaviour therapy using Learning mechanics- Game Mechanics (Arnab et al., 2015). The game had 3 main aims:

1. To put child protection into the context of the working day of a dental practice thus facilitating reflection on previous experiences and attitudes and thereby influencing future choices.

2. To highlight how factors such as time, stress, patient satisfaction and other external (uncontrollable) events may impact upon decision making.

3. To introduce the game players to ways of coping with or managing the personality traits or elements of disordered or unhelpful thinking that they may have in common with the game characters, so that they can use this game experience in their future professional decisions and lives.

The game was developed, tested, and adjusted to produce a playable game. This was the first reported example of a serious game approach being used in the subject area.

The final objective, objective 5 was to evaluate the serious game that was developed (Chapter 6). The game was evaluated by pre- and post-test questionnaires, the game experience questionnaire (IJsselsteijn et al., 2013) and focus groups. The participants' attitudes towards child protection and safeguarding in dentistry were roughly neutral before playing the game and remained so after the game from the results of the pre- and post- test questionnaires. The results from the core module of the GEQ suggested that the game is playable and does not offer a negative or annoying experience. The results from the social presence module of the GEQ suggested that the game worked as a co-operative game with players being involved psychologically and behaviourally with each other. The main themes from the focus groups were Relevance to Real Life, Personal Realisations, Experience and expectations of the game, Teamwork and Influencing factors. In the focus groups the participants reported reflecting on personal and professional experiences. They reported that the game reduced anxiety about future experiences, highlighted the need for constructive reflection and made them consider what they would do in future when faced with similar situations. The focus groups provided evidence of participants reflecting on their previous experiences and how their decisions were influenced by time, stress, and patient factors both in the game and in "real life". In the focus groups the participants discussed that the Character resources were relevant to them and discussed training courses, challenge worksheets, resilience and being well rested as particular resources they would find useful or keep in mind for the future. They also discussed the need for constructive self-reflection, the importance of looking after their own

wellbeing and of asking for help. This produced evidence that the game was successful in all 3 of the main aims.

7.2 Key Findings and Contributions to Knowledge

7.2.1 Key Findings from Literature Review

The literature review illustrated the problem of dental team professionals not always referring their concerns about potential child protection or safeguarding issues and for the first time brought together the results of research with over 12000 dental team professionals from all corners of the world to demonstrate that this is a global issue. Other key findings from the literature were that the main barriers to the referral of child protection concerns by dental team professionals in could be grouped into fears, uncertainties, and lack of knowledge. Prior to this literature review the assimilation of all the previous studies regarding barriers had not been reported, therefore this has contributed to knowledge as it summarises the results of studies with a total of over 10000 participating dental team professionals. In addition, the literature review has clearly shown the issues are not unique to dental team professionals.

7.2.2 Key Findings from Interviews

The in-depth interviews were the first of their kind investigating the reality of dealing with child abuse and neglect concerns for dental team professionals in Scotland. This type of investigation of this topic had never been undertaken with Scottish dental teams before and brought a new understanding to the issues that they face in their professional and personal lives when it comes to experiences of concerns about child abuse and neglect. The interviews provided rich information about factors that affected referral. These were factors related to culture, the dental practitioner themselves, training factors, referral factors, the decision difficulty and, overwhelmingly, fear. The in-depth interviews provided important information about the reality of this for Scottish dental team professionals and identified the overarching theme of fear as one of the key issues. This led to fear being the target for the serious game intervention also provided ideas of what other desired training to address these factors could be.

7.2.3 Key Findings from Evaluation of Serious Game Intervention

This is the first reported example of using a serious game to address the fears of dental team professionals with regards to child protection, in fact it is the first time a serious game has been used this way to address any professional decisions in dentistry. The serious game reduced anxiety about future experiences, highlighted the need for constructive reflection and made participants consider what they would do in future when faced with similar situations. This has never previously been reported for a serious game in this field. The participants also picked up ways of managing the personality traits or elements of disordered thinking that they had in common with the characters in the game and that contribute towards their fears. Again, this method of using elements of CBT in a game to address fears in relation to dental team professionals has never previously been reported. Playing the game resulted in discussions and reflection about how the different influencing factors affected decisions. The serious game intervention did not have a measurable effect on attitudes towards child protection measured with the pre- and post-test questionnaire, however. The GEQ demonstrated that the game worked as a cooperative game and players were psychologically and behaviourally involved with each other. The focus groups provided evidence of participants reflecting on their previous experiences and how their decisions were influenced by time, stress, and patient factors. This adds to the body of evidence on the evaluation of serious games as well as showing the, albeit limited, success of the current game.

This thesis has also presented the use of the LM-GM model (Arnab et al., 2015) by a domain expert without a games design background and serves as a successful example of how it can be used to integrate ILOs when developing a serious game to be used in teaching and training.

7.3 **Limitations**

7.3.1 Limitations of In-depth Interviews

The main methods that had been used in the literature to identify the barriers to referral for dental team professionals were quantitative studies (which reported the percentages of dental team professionals who agree with the suggested barriers or attempted to link respondent characteristics to their likelihood of

reporting) and focus groups looking to explore what the barriers may be. These methods contributed to knowledge of the presence of the barriers but not to why these barriers persist and how they could be overcome. The in-depth questionnaires that we conducted attempted to address unexplored areas. As qualitative research involves some abstraction and interpretation of the raw data it is possible that another researcher may have constructed alternative themes. To address this, we left a clear audit trail so that readers would be able to follow how the research was done and the relevance of the decisions that were taken.

7.3.2 Limitations of Serious Game Design

A serious game intervention for use in the teaching and training of child protection in dentistry has never been reported in the literature. Current interventions tend to be procedural or targeted at the perceived lack of knowledge, but none attempt to overcome barriers. It is not possible to say whether a different approach or area of the subject would have had a greater impact. Potentially a multi-player on-line serious game may have had a greater impact, but this was not possible given the time limits of the doctoral research, the lack of available funding for such a large development and the lack of previous significant experience in serious game development of the author. The benefits of a tabletop game are that it can be played anywhere without the need for access to computer equipment or internet connection.

7.3.3 Limitations of Evaluation of Serious Game

As previously noted, one limitation was the use of dental students as the participants in our evaluation of the serious game. The literature review addressed the problem of not always referring suspected cases of CAN by qualified dental team professionals and the game was intended to be used in qualified individuals, however the time constraints in applying for NHS permissions and getting access to dental practices meant that the pragmatic option was to recruit a population of final year dental students who were close to graduating and therefore about to become qualified dental team professionals. There are challenges in evaluating as learning from a serious game can be assessed quickly for knowledge but the assessment for change or

complex topics must be longitudinal. Due to the time constraints of doctoral research, we were limited in the evaluation and although the focus groups did provide evidence that the game met it aims it would benefit from further investigation to provide more robust evidence, perhaps by way of a randomized controlled trial (RCT). In this situation an RCT would involve recruiting, for example, a group of dental practices who would play the game and compare them to a group of practices who would receive standard training in child protection and neglect and them comparing their attitudes pre and post-delivery of training. There is, however, debate as to whether RCTs are of benefit in the evaluation of serious games (Westera, 2015). One side of the argument is that they are required and are currently lacking (Connolly et al., 2012) while others feel that RCTs are not appropriate as the variables cannot be adequately controlled in research on teaching methods (Shaver, 1983) and there is a lack of consensus the most appropriate statistical tests and parameters to use to determine whether effects are significant (Lew, 2013, Johnson, 2013). RCTs are well accepted methods in dentistry and are seen as providing high quality evidence so despite the arguments against them being used for serious game evaluation an RCT could, in theory, make the game more acceptable to dental team professionals and improve the adoption of it as a teaching and training method. Alternatively longitudinal research to measure the impact of the training with and without the serious game would provide good evaluation evidence as only once the individual dental team professionals have been in a situation where they can apply their learning from the game would we know the impact. Despite these limitations the evaluation was conducted using techniques commonly used in the literature and did produce evidence that it met its aims and was an enjoyable experience for the participants.

7.4 Recommendations For Future Work

Although this work has produced some evidence that this game is effective future work could include further testing of the current game which might include:

1. A randomised controlled trial with a control group of dental students who would receive their child protection teaching and training without the use of the

serious game compared to an intervention group who would play the game as part of their teaching and training.

2.A randomised controlled trial with a group of dental practices from which all the staff would receive their child protection training without the use of the serious game compared to an intervention group who, as teams in practices, would play the game as part of their training. The groups would have their attitudes compared with pre and post-test questionnaires.

3. Longitudinal follow up of referral rates in dental team professionals who have played the game compared to a matched control group of dental team professionals who have not played the game.

4. Long term monitoring of the gap between suspicion and referral rates for dental professionals in Scotland who have played the game.

5. Use of the pre- and post- test questionnaire with larger groups and at an additional point in time to see if there are any demonstrable changes in attitudes that were not picked up due to the sample size involved in the evaluation.

Longitudinal research such as that proposed in items 3 and 4 above would provide good evidence of the effect of the game as only once the individual dental team professionals have been in a situation where they can apply their learning from the game would we know the true impact. Longitudinal studies are, of course, more expensive and time consuming but are of high value in this situation. The RCTs discussed above would be useful and provide high quality evidence which is generally well accepted in the dental field. This may encourage the adoption of the serious game or increase the speed at which it is adopted, and they are less costly than longitudinal studies, but they would not demonstrate the true impact of the game.

Future work will also plan include integration of the serious game intervention into the undergraduate curriculum for dental students in Glasgow Dental School as well as use of the game in continued professional development for dental team professionals.

This project has shown that there are other barriers to referral which could be targeted by a serious game intervention, and this is deserving of further investigation given the positive results of the evaluation of the serious game in this project.

Future collaboration with a group who are skilled in the development of games is another possibility. Further work on the game may also include translation into other languages as the “gap” between those who suspect and refer is a global phenomenon.

This work may also go some way to supporting the collection of information regarding how many children are referred to social services in Scotland, and what proportion of those referrals come from health professionals which currently is not collected by The Scottish Government's Children and Families Analysis Team. Without this information it is difficult to get an objective figure as to how many healthcare professionals, let alone dental team professionals, make child protection referrals to social work in Scotland and determination of the gap between suspicion and referral relies on the self-report of dental team professionals.

There has also been interest in the game from other undergraduate subject experts through informal discussions. Notably those involved in the delivery of veterinary medicine have expressed interest in exploring the game to help prepare students more fully for the stresses of general practice. In veterinary medicine there are issues related to the association between the abuse of animals and the abuse of children. The game may be a useful addition to veterinary teaching, as well as raising awareness among their students of the time-management, personality types, colleague and client expectations that contribute to the working pressures within practices.

Appendix 1 Topic Guide for In-Depth Interviews

The Dental Team and Child Protection

Research Topic: The landscape of child protection in dentistry
Research question:
What is involved in the decision by a member of the dental team to refer a paediatric patient or not and what influences the decision?

1. Introduction
    - Introduce study, its aims and researcher
    - Brief discussion of ethical issues
2. Background
    - Length of time qualified
    - Length of time in current place of work
    - Type of work
    - Community served
    - Typical day
    - Ever referred
    - Approach to patient care/ views on holistic care
3. Dental teams and child protection
    - Definitions
        - Child protection
        - Child abuse
        - Neglect
        - Welfare concerns
        - Safeguarding
        - Referral
    - How does child protection relate to dental teams?
    - Responsibilities
4. Training
    - CPD- picking topics
    - Training in child protection/safeguarding
        - What
        - When
        - How often
        - Why
        - Good/bad points
        - Ideal
            - Attributes
            - Type
            - Topics
5. A time you had concerns about a child patient
    - What happened
    - What did you do

- Feelings
- Refer/not
- Decision
- Why do you think some people don't refer?
- Why do you think some people do?
- Discussion
- Helps/ hinders
- Getting it right/wrong- what does this mean?
- Other people
- Time
- Situation
- Barriers/ enablers

6. Rules/ Regulations
    - What are you aware of?
        - GDC
        - CYPA
        - Local
        - Practice policy
        - National guidance
7. Wider attitudes
    - Feelings about involvement in Child protection in general
    - Outside of work
8. Conclusion and thanks
    - Is there anything else you would like to add?

Appendix 2 NHS Ethical Approval Not Required

NHS
Health Research Authority

MRC Medical Research Council

Do I need NHS REC approval?

To print your result with title and IRAS Project ID please enter your details below:

Title of your research:

The landscape of child protection in dentistry:an investigation

IRAS Project ID (if available):

174720

Your answers to the following questions indicate that **you do not need NHS REC approval for sites in Scotland.** However, **you may need other approvals.**

You have answered ***'YES'*** to: Is your study research?

You answered ***'NO'*** to all of these questions:

Question Set 1

- Is your study a clinical trial of an investigational medicinal product?
- Is your study one or more of the following: A non-CE marked medical device, or a device which has been modified or is being used outside of its CE mark intended purpose, and the study is conducted by or with the support of the manufacturer or another commercial company (including university spin-out company) to provide data for CE marking purposes?
- Does your study involve exposure to any ionising radiation?
- Does your study involve the processing of disclosable protected information on the Register of the Human Fertilisation and Embryology Authority by researchers, without consent?
- Is your study a clinical trial involving the participation of practising midwives?

Question Set 2

- Will your study involve research participants identified from, or because of their past or present use of services (adult and children's healthcare within the NHS), for which the UK health departments are responsible (including services provided under contract with the private or voluntary sectors), including participants recruited through these services as healthy controls?
- Will your research involve collection of tissue or information from any users of these services (adult and children's healthcare within the NHS)? This may include users who have died within the last 100 years.
- Will your research involve the use of previously collected tissue or information from which the research team could identify individual past or present users of these services (adult and children's healthcare within the NHS), either directly from that tissue or information, or from its combination with other tissue or information likely to come into their possession?

Question Set 3

- Does your research involve recruiting adults who lack capacity to consent for themselves, including participants retained in study following the loss of capacity?
- Will your research involve whole organs retained from a post mortem examination carried out on the instructions of the Procurator Fiscal?
- Will your research involve the analysis of DNA from bodily material, collected on or after 1st September 2006, and this analysis is not within the terms of consent for research from the donor?

Question Set 4

- Is your research health-related and involving prisoners?
- Does your research involve xenotransplantation?
- Is your research a social care project funded by the Department of Health (England)?

If your research extends beyond **Scotland** find out if you need NHS REC approval by selecting the *'OTHER UK COUNTRIES'* button below.

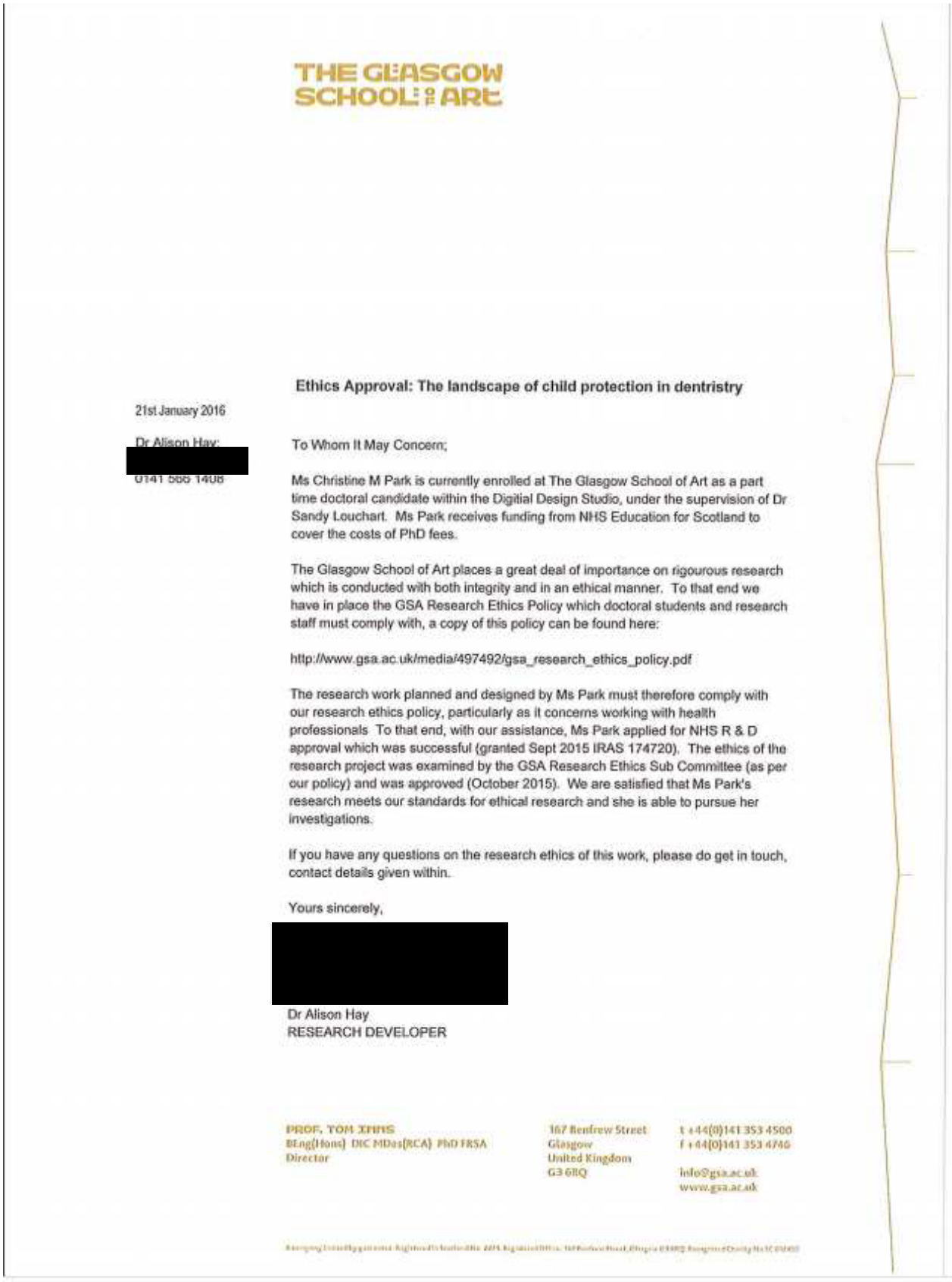
OTHER UK COUNTRIES

If, after visiting all relevant UK countries, this decision tool suggests that you do not require NHS REC approval follow this link for final confirmation and further information.

Print This Page

NOTE: If using Internet Explorer please use browser print function.

Appendix 3 GSA Ethical Approval



THE GLASGOW SCHOOL OF ART

Ethics Approval: The landscape of child protection in dentristry

21st January 2016

Dr Alison Hay
[redacted]
0141 566 1408

To Whom It May Concern;

Ms Christine M Park is currently enrolled at The Glasgow School of Art as a part time doctoral candidate within the Digitial Design Studio, under the supervision of Dr Sandy Louchart. Ms Park receives funding from NHS Education for Scotland to cover the costs of PhD fees.

The Glasgow School of Art places a great deal of importance on rigourous research which is conducted with both integrity and in an ethical manner. To that end we have in place the GSA Research Ethics Policy which doctoral students and research staff must comply with, a copy of this policy can be found here:

http://www.gsa.ac.uk/media/497492/gsa_research_ethics_policy.pdf

The research work planned and designed by Ms Park must therefore comply with our research ethics policy, particularly as it concerns working with health professionals To that end, with our assistance, Ms Park applied for NHS R & D approval which was successful (granted Sept 2015 IRAS 174720). The ethics of the research project was examined by the GSA Research Ethics Sub Committee (as per our policy) and was approved (October 2015). We are satisfied that Ms Park's research meets our standards for ethical research and she is able to pursue her investigations.

If you have any questions on the research ethics of this work, please do get in touch, contact details given within.

Yours sincerely,

[redacted]

Dr Alison Hay
RESEARCH DEVELOPER

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Appendix 4 Participant Information Leaflet

Participant Information Sheet

The landscape of child protection in dentistry

We would like to invite you to take part in our research study. Before you decide we would like you to understand why the research is being done and what it would involve for you. One of our team will go through the information sheet with you and answer any questions you have. We'd suggest this should take about 10 minutes. Please talk to others about the study if you wish and ask us if there is anything that is not clear.

(Part 1 tells you the purpose of this study and what will happen to you if you take part. Part 2 gives you more detailed information about the conduct of the study).

Part 1

What is the purpose of the study?

This study aims to discover what is involved in the decision by dental team members to refer suspected cases of child abuse and neglect. This research is part of a larger PhD by the main researcher (Christine Park).

Why have I been invited?

You have been invited because you work, or have worked as a member of a dental team in Scotland.

Do I have to take part?

It is up to you to decide to join the study. We will describe the study and go through this information sheet. If you agree to take part, we will then ask you to sign a consent form. You are free to withdraw at any time, without giving a reason.

What will happen to me if I take part?

You will be interviewed by one of the researchers at a location and time convenient to you. This interview will last approximately 1 hour and it will be audio recorded. The researcher may also take notes. The study is expected to take 3 years but you will only be interviewed on one occasion.

What will I have to do?

You will have to agree to and take part in an in-depth interview with one of the researchers.

What are the possible disadvantages and risks of taking part?

Before participating you should consider carefully whether discussing issues around child protection in dentistry would be uncomfortable or upsetting for you and take advice if necessary.

What are the possible benefits of taking part?
We cannot promise the study will help you but the information we get from this study may help develop improved training in recognising and reporting of child protection concerns by dental teams and may help to influence policies surrounding this.

What happens when the research study stops?
The results will be written up and the findings will be published in scientific journals.

What if there is a problem?
Any complaint about the way you have been dealt with during the study or any possible harm you might suffer will be addressed. The detailed information on this is given in Part 2.

Will my taking part in the study be kept confidential?
Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. The details are included in Part 2.

Part 2

What will happen if I don't want to carry on with the study?
If you withdraw from the study, we will destroy all your identifiable data and recordings.

What if there is a problem?
If you have a concern about any aspect of this study, you should ask to speak to the researchers who will do their best to answer your questions (Christine Park 0141 211 9666, Christine.park@glasgow.ac.uk). If you remain unhappy and wish to complain formally, you can do this. Details can be obtained from The Glasgow School of Art Graduate School on 0141 558 1408.

Will my taking part in this study be kept confidential?
If you join the study, some parts of the data collected for the study will be looked at by authorised persons from the Glasgow School of Art and Glasgow Dental School. They may also be looked at by authorised people to check that the study is being carried out correctly. This data will have your name and address removed so you cannot be identified. All will have a duty of confidentiality to you as a research participant and we will do our best to meet this duty

What will happen to the recordings of the interviews?
The recordings of the interviews will be transcribed with all identifiable details removed. The audio recordings will be kept for 1 year after the conclusion of the research.

What will happen to the results of the research study?
The broad scientific results of the study will be used as part of a wider PhD study by the main researcher. The results will be published in scientific journals and will be made

available to participants by email if they wish them. You will not be identified in any report or publication.

Who is organising and funding the research?
The research is sponsored by Glasgow School of Art and is funded by NHS Education for Scotland.

Who has reviewed the study?
This study has been reviewed and given favourable opinion by

Further information and contact details

General information about qualitative research:
http://www.healthknowledge.org.uk/public-health-textbook/research-methods/1d-qualitative-methods/section1-qualitative-methods-health-research

Specific information about this research project contact:
Christine Park (Clinical lecturer/ Part time PhD student)
Glasgow Dental School/ Digital Design Studio
[redacted]
01412119666

Advice as to whether you should participate contact:
Christine Park:
Richard Welbur
Paul Anderson; [redacted]

Who to approach if unhappy with the study

Prof Richard Welbury
Professor of Paediatric dentistry
Glasgow Dental Hospital & School
378 Sauchiehall Street
Glasgow. G2 3JZ
G511EA

Dr Sandy Louchart
Senior Research Fellow
Digital Design Studio
Glasgow School of Art
The Hub, Pacific Quay, Glasgow.
01415661173

[redacted]

Appendix 5 Consent Form for In-Depth Interviews

Title of Project: The landscape of child protection in dentistry

Name of Researcher:
Christine Park, Digital Design Studio, Glasgow School of Art/ University of Glasgow
Supervisors:
Dr Sandy Louchart, Glasgow School of Art
Prof Richard Welbury, Glasgow Dental Hospital &School, University of Glasgow

Please initial box

1. I confirm that I have read and understand the information for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, and without my legal rights being affected. ☐

3. I understand that relevant sections of my data collected during the study, may be looked at by individuals from Glasgow School of Art and Glasgow Dental School, where it is relevant. I give permission for these individuals to have access to my data. I give my consent to the use of data for this purpose on the understanding that:
   - All names and other material likely to identify individuals will be anonymised.
   - The material will be treated as confidential and kept in secure storage at all times.
   - Any personal identifiable material will be destroyed once the project is complete.
   - The material may be used in future publications, both print and online. ☐

4. I wish the researcher to contact me by email with the results of this study ☐

5. I agree to take part in the above study. ☐

_____ _____ _____
Name of Participant Date Signature

_____
Email address (if wish to be contacted with results of study)

_____ _____ _____
Name of Researcher Date Signature

Appendix 6 Research Protocol for In-Depth Interviews

Research protocol for "The landscape of child protection in dentistry: an investigation"

Contents

2. Rationale & background information

Despite increases in the amount of child protection training available for dental teams since 2006 there remains a 26% gap between the proportion of general dental practitioners who have suspected child abuse or neglect in one or more of their paediatric patients (37%) and the proportion who had referred suspected cases (11%) (Harris et al, 2013). This gap between suspicion and referral is not unique to Scotland. Previous work used initial in-depth interviews with key informants to produce a topic guide for focus group research (Welbury et al, 2003). This study elicited background issues (including isolationism, lack of holistic approach to patient care and attitudes to further training and professional development), perceptions and behaviour in child protection issues and inhibiting and motivating factors in child protection (difficulty in identifying abuse, concern about the outcome and need for certainty before action). Since then quantitative methods have consistently shown that the gap between dentists who suspect and refer in Scotland is affected by lack of certainty of the diagnosis, fear of violence to the child, fear of consequences to the child from statutory agencies, lack of knowledge of referral procedures, fear of litigation, fear of violence to the general dental practitioner and concerns of impact on dental practices (Harris et al., 2013, Cairns et al., 2005). However this fails to tell the whole story as dental professionals are not the only healthcare professionals to have a gap between those who suspect and those who refer. As many of the identified fears have been targeted by training it is clear that all that is involved in the decision by a dental professional to refer is not yet fully understood. We do not know what feelings/ emotions are involved for the referrer or their team members. We also do not yet know how referral is affected by beliefs, previous experience, time pressure and emotions and how work done in the area and science of decision making could be

applied to this situation in dentistry. There may be other factors not yet postulated and so before this gap can be targeted we must first understand why it exists and whether it will ever be possible to eliminate it. This then begs the question as to why it would be important to address the gap at all. The answer lies in the assumption that all of the children whom the dentists have suspicions about must have some welfare concerns, or else the dentists would not be suspicious. If all the children for whom dentists were concerned about were referred to appropriate agencies many more children could have their welfare protected and promoted. That would benefit the individual child (prevent morbidity and mortality) and also benefit society. All types of abuse and neglect are associated with poorer mental health and other longer-term health consequences (cancer, chronic lung disease, fibromyalgia, irritable bowel syndrome, ischaemic heart disease, liver disease, reproductive health problems). In light of this if you can identify and refer children as early as possible the benefits to society could be vast.

Once we understand everything involved in the decision to refer it will give us the potential to facilitate actions to target barriers and promote enablers of referral. Analysis on its own is not enough but it is an important starting block as without it policy will be ill informed and training may not deliver what dental teams want, or need. In 2013 I reported that 15 % of Scottish dentists had never had any form of child protection training, nor had they read “Child Protection and the Dental Team” which is a widely available, well respected resource for dental teams. Only 29 % of dentists had had child protection training at undergraduate level and 55% at postgraduate level. There are courses in child protection training available to dentists but it is clear these are not being taken up “across the board”. Partly this may be because protection training is not mandatory for general dental practices. In 2015 the General Dental Council finally made it a recommended continued professional development (CPD) topic for all members of the dental team but it is still not mandatory. It is important to understand how members of the dental team select subjects to include in their 5 year CPD cycles. Reviews suggest that dentists own interests are important as well as the method of delivery of the CPD (Firmstone et al, 2013, Maidment, 2006, Barnes et al., 2012). There is a gap in knowledge with regard to how what the best way to provide child protection training is and what the views are of dental teams regarding this. My research with DDS aims to plug that gap.

3. References

Barnes E, Bullock AD, Bailey SER, Cowpe JG, Karaharju-Suvanto T (2012) A review of continuing professional development for dentists in Europe. European Journal of Dental Education 16: 166-178

Cairns AM, Mok JYQ, Welbury RR (2005) The dental practitioner and child protection in Scotland. British Dental Journal 199, 517–520; discussion 512; quiz 530–531.

Firmstone VR, Elley KM, Skrybant MT, Fry-Smith A, Bayliss S, Torgerson CJ (2013) Systematic Review of the Effectiveness of Continuing Dental Professional Development on Learning, Behavior, or Patient Outcomes. Journal of Dental Education 77 (3): 300-315.

General Dental Council (2015) Safeguarding become recommended CPD http://www.gdc-uk.org/Newsandpublications/Pressreleases/Pages/Safeguarding-becomes-recommended-CPD.aspx

Harris CM, Welbury R, Cairns AM (2013) The Scottish dental practitioner’s role in managing child abuse and neglect. British Dental Journal 214 (9): E24 DOI:10.1038/sj.bdj.2013.435

Harris J, Sidebotham PD, Welbury R (2006) Child Protection and the Dental Team: An introduction to safeguarding children in dental practice. Sheffield: Committee of Postgraduate Dental Deans and Directors.

Maidment Y (2006) A comparison of the perceived effects on Scottish general dental practitioners of peer review and other continuing professional development. British Dental Journal 200 (10): 581-584

Welbury RR, MacAskill SG, Murphy JM, Evans DJ, Weightman KE, Jackson MC, Crawford MA (2003) General dental practitioners' perception of their role within child protection: a qualitative study. European Journal of Paediatric Dentistry 4: 89-95

4. Study goals & objectives

I aim to discover what is involved in the decision by a member of the dental team to refer a child about whom they have welfare concerns. This research study asks the questions- "What is involved in the decision by a member of the dental team to refer or not refer a paediatric patient to appropriate services and what influences the decision?"

5. Study design

My research design will be qualitative in depth exploratory interviews with research participants to fully explore situations when research subjects have had child protection concerns. There will only be one interview with each research subject. Principle inclusion criteria are: current or recently active member of a Scottish dental team (retired not more than 2 years previously) holding, or having held, full registration with the general dental council at the time of their activity with a dental team, fluent English speakers and able to understand written English and over 16 years old. Principle exclusion criteria are: any condition or circumstance which may affect the participants capacity to consent to involvement in the research project such as illness or injury, anyone who after reading the participant information feels that involvement in the research would be too upsetting or cause an exacerbation of any current medical condition or those with no relevant experience of working in a Scottish Dental team.

A purposive sampling matrix (appendix 1) has been selected to give a heterogeneous/ broad cross section of members of the dental team to allow comparative understanding. The target population included dental practitioners, dental nurses and dental hygienists/therapists working in dental primary care in Scotland. Fifteen initial purposive selection criteria were identified and refined to 12 primary and 3 secondary criteria. Primary criteria were entered into a sampling matrix table to give a sample size of 18 to 50 participants which is in keeping with average participant numbers in qualitative research.

The topic guide (appendix 2) for in-depth exploratory interviews was developed using a "bottom up" approach. All topics of interest were listed then sorted under main and sub topic headings. Topic guide development resulted in 8 main headings to explore the research question of "What is involved in the decision by a member of the dental team to refer a paediatric patient or not, and what influences the decision?" Each main heading was followed by between 2 to 14 sub topic headings.

The data collection period for the in depth interviews is expected to last for 1 year followed by transcription and analysis (see appendix 3).

6. Methodology

In-depth exploratory interviewing techniques will be used to discover what feelings, personal factors, experiences, environmental factors and other influences are involved in the decision to refer a paediatric patient whom dental professionals have concerns about. This qualitative technique will map the range of responses from a selection of general dental practitioners in Scotland. A cross sectional sample will be selected. Volunteer participants who are happy to discuss cases when they had concerns about a child (whether they referred or not) will be sought from the population of members of the dental team in Scotland. This will be done by way of calls for participants sent through local dental societies such as the West and East of Scotland BSPD and BDA, as well as invitations sent through social media to dental contacts which can then be shared with a wider audience. In addition local word of mouth will also be used. If participant numbers remain small and data saturation is not met, or areas of the participant selection matrix identified as important are missed, then consideration of advertisements seeking participants in relevant Scottish Dental Media can be placed. Valid consent will be gained from all participants. This will include a signed consent form for the interview participants.

7. Safety considerations

Identification of members of the dental team to interview about their involvement in cases where they have had concerns about paediatric patients may raise concerns as people who feel they may have not acted as they should have might not be willing to talk about it. This will be addressed through careful development of the topic guide for the interviews which will involve asking participants to recall one or 2 occasions they have been involved in through a story telling style. No pressure will be placed upon participants and they are free to withdraw at any time. If a participant decides to withdraw no part of their contribution will be used in the research.

Discussions around concerns about paediatric patients may bring up concerns or distresses. The interviewer is trained to refer participants onto appropriate services should any unresolved issues arise. For example the interviewer may refer the participant to their local child protection services.

8. Data management & analysis

The audio recordings in-depth interviews will be transcribed verbatim and thematic analysis carried out to discover answers to the research questions. This will then be related back to the current thinking and ideas in this field and any similarities or differences discussed. Qualitative methods will be employed for the data analysis using an inductive approach employing an emergent framework to group data and then look for relationships. This will involve organisation of the data collected, identification of an explanatory framework, coding of the data plus modification of the framework, initial descriptive analysis of the data followed by second order analysis. Second order analysis will identify recurrent themes and patterns as well as identifying respondent clusters. The data will be searched to answer my research questions and allow development of hypotheses. Original audio recordings will be kept for 1 year post PhD viva and the transcriptions kept for 10 years. Personal data will be kept on an encrypted USB stick and paper copies of consent forms will be kept in a locked filing cabinet in a locked staff office in Glasgow Dental Hospital. To ensure confidentiality of personal data a unique code identifier system for pseudonymisation of the data will be used which will not be shared with anyone else. No third party will have access to this code.

9. Quality assurance

As this is a PhD study the scientific quality review has been undertaken by the researcher's supervisors and through review by the Glasgow School of Art. A regular supervision arrangement with supervisory team is in place as well as annual review and progression events as part of student progress through Glasgow School of Art. At the progression events representatives from the supervisory team (made up of supervisors from both the Digital Design Studio and Glasgow Dental School) as well as NHS Education for Scotland will attend.

10. Expected outcomes of the study

The study will identify and explain the reasons behind the ever present gap between the proportions of members of the dental team who suspect abuse/ neglect in their paediatric patients and those who actually refer their suspicions onto appropriate services. As this gap is not exclusive to dental teams and it is an international issue understanding of this gap will create the opportunity for targeted interventions to be developed. As well as having a likely impact on the design of child protection training for dental teams this results may influence policy. If the results to identify areas for targeted action this will potentially impact on the health and wellbeing of society as earlier identification of children at risk of or suffering from abuse and neglect paves the way for earlier interventions which reduce long term morbidity and mortality. Some lives will be saved and some will be improved.

11. Dissemination of results and publication policy

Results will be published and disseminated in scientific journals. If participants wish to be informed of the results they will be emailed to the participants. Any results which will impact on policy will be communicated to the relevant policy makers.

12. Duration of the project

My plan over the next 3.5 years continuing on a part time basis is:

- Literature review first draft to be completed September 2015
- Progression event in September 2015
- Complete NHS ethic/R & D application by September 2015
- Participant invitation/recruitment (Sept - Dec 2015)
- In depth interviews/ data collection (Sept 2015- Sept 2016)
- Transcription of Interviews will begin as fieldwork commences and be complete approximately 3 months after the end of interviews
- Analysis of results will then take approximately 6-9 months
- Writing up of final results will begin in year 4 and last until submission (approx. 12 months)

Please see appendix 3 for the relevant Gantt chart.

13. Problems anticipated

As this study is a part time PhD project the timeframe will have to be adhered to but this is often tricky when balancing a clinical profession. The solution to this will be careful planning and undertaking of all tasks involved and early identification of any issues that may set back deadlines. A further problem may be in the recruitment of participants. As this is qualitative research the minimum number of participants that would be felt adequate to map the landscape as it relates to child protect ion in dentistry is 18, with a maximum of 50. This seems to be a reasonable achievable target but it may change if data saturation is reached early.

14. Project management

PhD student and Chief Investigator: Mrs Christine Park

Academic Supervisors: Dr Sandy Louchart, Digital Design Studio, Glasgow School of Art
Prof Richard Welbury, Glasgow Dental School, University of Glasgow

Research Sponsor: Glasgow School of Art Research & Graduate School

15. Ethics

Participants will be invited to participate and the researcher will go through an information leaflet with them to help them to decide whether they wish to participate. Only if the participants agree of their own free will and sign the consent form will the interviews proceed. Identification of members of the dental team to interview about their involvement in cases where they have had concerns about paediatric patients may raise concerns as people who feel they may have not acted as they should have. No pressure will be placed upon participants and they are free to withdraw at any time. If a participant decides to withdraw no part of their contribution will be used in the research. Discussions around concerns about paediatric patients may bring up concerns or distresses. The interviewer is trained to refer participants onto appropriate services should any unresolved issues arise. For example the interviewer may refer the participant to their local child protection services.

If participants find topics embarrassing, sensitive or upsetting the interview can be stopped at any point that the participant requests. The interviewer is an experienced paediatric dentist who can give advice regarding self-referral onto local counselling services, occupational health or other suitable qualified professionals as may be found necessary. It will be made clear to participants at the start of interviews that although the interviews are confidential if anything is said that would suggest a child or any other patient or person's safety is at risk that those comments cannot be kept confidential but will be reported to the appropriate agency, and this would be the only reason the list of participants against the interview lists would be used to identify a participant.

The study has been deemed not to require NHS ethics approval but ethics approval has been sought from the Glasgow School of Art.

Appendix 1

Sampling Matrix for mapping the landscape of child protection in dentistry

Sampling rationale:-

Purposive sample: a heterogeneous/ broad cross section of dentists and other members of the dental team to allow comparative understanding.

- Target Population
    - Dental practitioners, dental nurses and dental hygienists/therapists working in primary care/ general dental practice/ public dental service

Initial purposive selection criteria:

- Age
- Gender
- Regional location
- Number of dentists in practice
- Deprivation area of practice- SIMD quintile
- Family unit composition/ marital status
- NHS only or mixed NHS/ private
- Income level
- Full time or part time employment
- Small or large community
- Living in same community as work in
- Previous referral status
- Years since qualification
- Type of dental care professional

Primary Criteria

- Years since qualification
- Gender
- SIMD area of practice
- Full time/part time employment
- Previous referral status
- Number of dentists in practice
- Living in same community as work in
- Family unit composition/ marital status
- NHS only/ mixed NHS/private
- Small/ large community
- Type of dental care professional
- Previous child protection training status

Secondary criteria

- Income level (absorbed in type of employment, and type of dental care professional)
- Regional location (absorbed in SIMD quintile)
- Age (absorbed in years since qualification)

		Have referred		Never referred		Family/marital status	Small community/large community	Living in same community as work	
		M	F	M	F			yes	no
Less than 5 years qualified		1-3	1-3	2-4	2-4	mixture	mixture	1-3	2-4
5-15 yrs qualified		1-3	1-3	2-4	2-4	mix	mix	2-6	2-6
15 + years qualified		1-3	1-3	2-5	2-5	mix	mix	3-8	2-6
Employment status	Full time	3-5		6-8		mix	mix	mix	mix
	Part time	1-5		6-8		mix	mix	mix	mix

Child protection training	yes	6-10	6-10
	no	6-10	6-10
SIMD of practice	SIMD < 3	4-5	6-8
	SIMD 4 or 5	1-3	6-8
Type of practice	NHS only	4-6	4-6
	NHS/ Private	6-8	6-8
	Private Only	2-4	2-4
Type of dental care professional	dentist	12-40	
	other	6-10	

Range for total sample 18- 50 participants split between health boards/ regions

Appendix 2

Topic Guide

The Dental Team and Child Protection

Research Topic: The landscape of child protection in dentistry
Research question:
What is involved in the decision by a member of the dental team to refer a paediatric patient or not and what influences the decision?

Introduction

- Introduce study, its aims and researcher
- Brief discussion of ethical issues

Background

- Length of time qualified
- Length of time in current place of work
- Type of work
- Community served
- Typical day
- Ever referred
- Approach to patient care/ views on holistic care

Dental teams and child protection

- Definitions
    - Child protection
    - Child abuse
    - Neglect
    - Welfare concerns

    - Safeguarding
    - Referral
- How does child protection relate to dental teams?
- Responsibilities

Training

- CPD- picking topics
- Training in child protection/safeguarding
    - What
    - When
    - How often
    - Why
    - Good/bad points
    - Ideal
        - Attributes
        - Type
        - Topics

A time you had concerns about a child patient

- What happened
- What did you do
- Feelings
- Refer/not
- Decision
- Why do you think some people don't refer?
- Why do you think some people do?
- Discussion
- Helps/ hinders
- Getting it right/wrong- what does this mean?
- Other people
- Time
- Situation
- Barriers/ enablers

Rules/ Regulations

- What are you aware of?
    - GDC
    - CYPA
    - Local
    - Practice policy
    - National guidance

Wider attitudes

- Feelings about involvement in Child protection in general
- Outside of work

Conclusion and thanks

- Is there anything else you would like to add

Appendix 7 Participant Invitation for In-Depth Interviews

Would you like to discuss issues around child protection and dentistry?

We are currently recruiting members of dental teams in Scotland to be involved in research aiming to discover all that is involved in the decision to refer a suspected case of child abuse/ neglect and what prevents some people from doing so. You would be interviewed by the researcher on a one off basis at a time and location convenient to you. The researcher will travel to your preferred location. Interviews will be face to face and last approximately 60 minutes.The information we get from this study may help develop improved training in recognising and reporting of child protection concerns by dental teams and may help to influence policies surrounding this. This study is part of a doctoral research project which is funded by NHS Education for Scotland.

For further information please contact: Christine Park on [redacted] at any time or 0141 211 9666 (Tues or Fri only).

Appendix 8 Initial Thematic Framework for In-depth Interviews

Topics of interest recurrent across data set and relevant to evaluation question:

1.Culture Factors

1.1 Cultural acceptance of dental caries

1.2 Culture of the dental practice

1.3 Dental record not following child

1.4 Effect of local area

1.5 Fear of complaints

1.6 Financial factors

1.7 Hearsay

1.8 Input from other agencies

1.9 Policies and procedures

1.10 Professional vs member of the public

2. Decision difficulty

2.1 Difficult decisions

2.2 Straightforward decisions

2.3 The family involved

2.4 They type of children that are of concern

3. Dental professional factors

3.1 Approach to care

3.2 Background of the dental professional

3.3 Confidence

3.4 Experience

3.5 Feeling and emotions involved

3.6 Instinct

3.7 Personality

3.8 Wider inputs to the dental professional

4. Fear of getting it wrong

4.1 Causing issues where none exist

4.2 Desire for soft approach

4.3 Fear of making things worse

5. Referral Factors

5.1 Lack of feedback

5.2 Previous experience of referral

5.3 Problems surrounding what is meant

5.4 Time

6. Training Factors

6.1 Availability

6.2 Characteristics of desired training

6.3 Choosing CPD topics

6.4 Previous experience of training

6.4.1 Good points

6.4.2 Bad points

Appendix 9 Initial Consultation Cards

Pain

5

This patient has been having pain for the last 24 hours. It kept them awake last night. When you examine this patient you find that a premolar/ primary molar (child) is carious and non-vital with an associated buccal swelling

Treat the patient	2	2	2
Extended exam	Not playable		
Arrange Review	0	0	-1
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Root canal treatment

10

This patient has attended for root canal treatment on a molar

Treat patient	2	1	2
Extended exam	Not playable		
Arrange Review	Not playable		
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Ulcer

5

On examination of this patient you find an ulcer which the patient tells you has been present for 4weeks.

N. B. "Arrange review" cannot be played alone but may be played with "Extended exam"

Treat patient	Not playable		
Extended exam	2	2	-2
Arrange Review	1	1	-1
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Bruising to face

5

You see what looks like a slap mark on the patient's face

Treat patient	Not playable		
Extended exam	2	3	-2
Arrange Review	Not playable		
Refer	2	1	-1
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Straightforward extraction required

5

This patient needs a straightforward extraction.

Treat patient	0	0	0
Extended exam	Not playable		
Arrange Review	Not playable		
Refer	1	1	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Neglect

5

You note multiple carious teeth with draining abscesses. You check on the computerised records system and this patient has previously required extractions under general anaesthetic

Treat patient	5	4	2
Extended exam	2	1	-1
Arrange Review	1	1	-1
Refer	2	2	-3
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Pain

5

The parent accompanying this child tell you the child has been in pain for 3 weeks but this is the first time they've brought the child in in over 1 year. They've been missing school/ nursery and not eating properly.

Treat patient	3	3	2
Extended exam	2	1	-1
Arrange Review	1	1	-1
Refer	2	3	-2
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Examination- No changes/ everything looks stable

5

This patient has attended for an examination and everything looks stable

Treat patient	Not playable		
Extended exam	Not playable		
Arrange Review	1	1	-1
Refer	Not playable		
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Difficult extraction required

7

This patient has come in for an extraction and it is proving much more difficult than expected

Treat patient	5	2	-1
Extended exam	Not playable		
Arrange Review	Not playable		
Refer	2	3	-1
Ask forhelp or discuss	0	0	0
Give to a colleague	0	0	0

Appendix 10 Other Initial Cards

Mrs Alpha

Mrs Alpha has been working in this practice for 10 years. She likes things to run smoothly and works very efficiently. She tends to always think the absolute worst will always happen. She gets very anxious if things don't go as planned or she finds something unexpected, or something unexpected happens. She really struggles to make referrals as she assumes the worst thing possible will happen.

Starting levels: 5 / 9

time cost for treat patient: -1 less

Refer cost x3 stress

Mrs Alpha

Mr Bravo

Mr Bravo is a young professional who has been working at this practice for a year. He is very willing to help his colleagues but feels responsible whenever things do not go as planned or he cannot resolve a situation himself. Patients really like him as he is very thorough.

Starting levels: 8 / 6

"Take patient from colleague" x3 patient satisfaction and no effect if negative value.

Patient satisfaction always add +1 to total

Refer cost x2 stress

If "ask colleague for help" and no one helps x2 stress

Mr Bravo

Ms Charlie

Ms Charlie has been working in this practice for 5 years. She worries that patients and others think badly of her and takes every little criticism to heart. She is very self critical of her work and has extremely high standards.

Starting levels: 7 / 7

patient satisfaction additional +1 for "treat patient"

Treat patient +1 stress
Refer +1 stress
Discuss +1 stress
If "ask colleague for help" and no one helps x3 stress

Dr Delta

Dr Delta is longest serving member of staff in this practice. He tends to focus on his weaknesses and overlooks his strengths. He thinks that things never go right for him, if something is going to go wrong it will happen to him! He focuses far more on that rather than that he is well liked by his patients and colleagues.

Starting levels: 4 / 10

Patient satisfaction always add +2 to total

Extended examination +1 stress
Refer +1 stress

Dr Delta

Ms Charlie

Annie

33
Annie has been a patient of yours for many years. She is a compliant patient and not anxious.

	0
	0
	0

Brayden

64
Brayden has partial dentures with a few teeth left and is a heavy smoker and drinker. He only attends every 2 years or so, unless he has problems. He is an anxious dental patient.

	0
	+1
	-1

Colin

12
Colin is a nervous teenager but does manage to cope with treatment eventually .

	1
	0
	0

Harry

24
Harry has been a patient at this practice since he was a child. He is a regular attender.

	0
	0
	0

Danni

17
Danni is a somewhat withdrawn teenager. She is still at school. Her oral hygiene is poor and she is attending to have root canal treatment of a first permanent molar

	0
	0
	0

Evelyn

8
Evelyn is a slightly anxious 8 year old whose family are all fairly irregular attenders .

	+2
	+2
	+1

Fraser

2
Fraser is a boisterous 2 year old. His parents are grateful to anyone who can cope with him.

	1
	1
	2

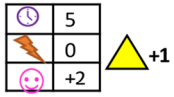
Gillian

6
Gillian is a shy 6 year old who is quite happy to attend the dentist.

	0
	0
	0

Treat patient

You have decided to treat this patient



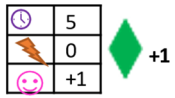
Cost to resolve: 1 coping card

Fully resolved : 1 event card, 1 coping card

Unresolved: 1 event card plus

Extended examination

You did not get enough information from the initial consultation and wish to do an extended examination



Cost to resolve: 1 coping card

Fully resolved: 2 event cards, 1 coping card

Unresolved: 2 event cards plus

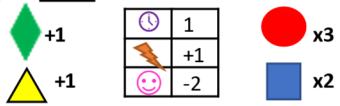
Arrange a review

Cost to resolve: 1 coping card

Fully resolved: 1 event card, 1 coping card

Unresolved: 1 event card plus

Refer



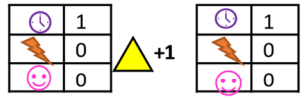
Cost to resolve: 2 coping cards

Fully resolved: 1 event card, 2 coping cards

Unresolved: 1 event card plus

Discuss

This player / All other players



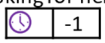
Cost 2 resolve 2 coping cards (can be from any players)

Fully resolved: All players 1 coping card each

Unresolved: This player 1 event card

Ask for help

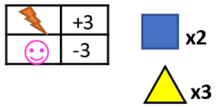
Player asking for help:



Cost to resolve: 1 coping card from player asking for help, 1 coping card from player agreeing to help

Fully resolved: 2 event cards, 1 coping card

If no one agrees to help:



Give patient to colleague

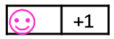
Player accepting patient takes all time costs.

Cost to resolve: 1 coping card from player giving patient away, 1 coping card from player accepting patient

Fully resolved: 1 coping card to each player involved

Take patient from colleague

Player taking patient takes all Time cost associated with patient



Cost to resolve 1 coping card from player giving patient away, 1 coping card from player taking patient

Fully resolved: 1 event card to each player involved

Rested
You have recently come back from a holiday and are feeling well rested.

Dealing with challenging patients

You have recently completed a training course in how to deal with challenging patients

Dealing with challenging patients

You have recently completed a training course in how to deal with challenging patients

Resilience
You are feeling particularly resilient today and can cope with whatever the day throws at you.

Resilience
You are feeling particularly resilient today and can cope with whatever the day throws at you.

Practical skills
Your practical hand skills are great today. You have been working hard recently improving in areas you felt you had less experience in.

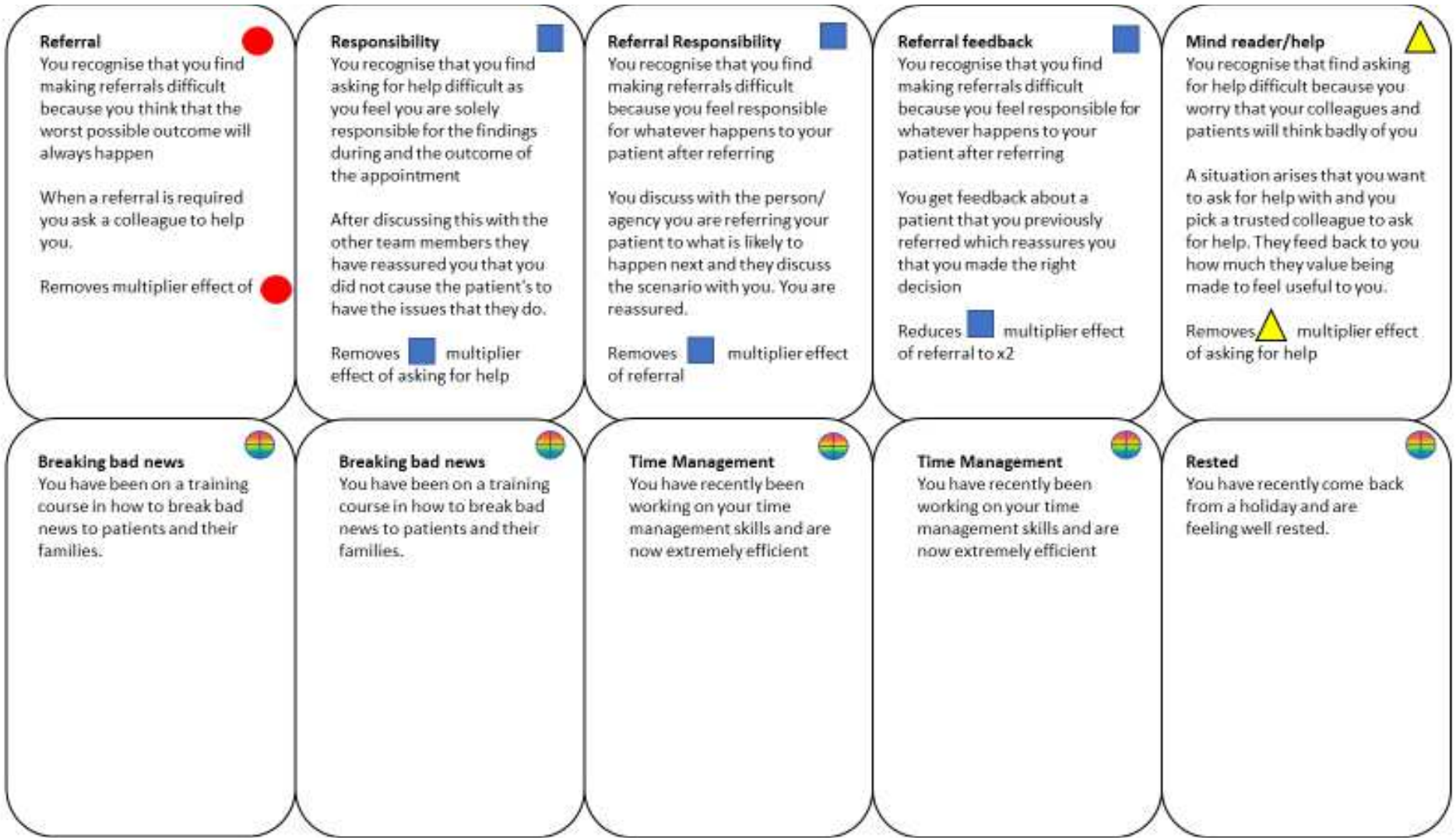
Practical skills
Your practical hand skills are great today. You have been working hard recently improving in areas you felt you had less experience in.

Managing complaints
You have undertaken a managing complaints training.

Managing complaints
You have undertaken a managing complaints training.

Referral concern
You have realised that always expecting the worse to happen is making referrals more stressful for you. You go back and look at a selection of the referrals you have previously made to hospitals and social work departments and are heartened to see that all the patients you have referred are still your patients.

Removes +1 stress effect of


Referral
You recognise that you find making referrals difficult because you think that the worst possible outcome will always happen
When a referral is required you ask a colleague to help you.
Removes multiplier effect of
Responsibility
You recognise that you find asking for help difficult as you feel you are solely responsible for the findings during and the outcome of the appointment
After discussing this with the other team members they have reassured you that you did not cause the patient's to have the issues that they do.
Removes multiplier effect of asking for help
Referral Responsibility
You recognise that you find making referrals difficult because you feel responsible for whatever happens to your patient after referring
You discuss with the person/ agency you are referring your patient to what is likely to happen next and they discuss the scenario with you. You are reassured.
Removes multiplier effect of referral
Referral feedback
You recognise that you find making referrals difficult because you feel responsible for whatever happens to your patient after referring
You get feedback about a patient that you previously referred which reassures you that you made the right decision
Reduces multiplier effect of referral to x2
Mind reader/help
You recognise that find asking for help difficult because you worry that your colleagues and patients will think badly of you
A situation arises that you want to ask for help with and you pick a trusted colleague to ask for help. They feed back to you how much they value being made to feel useful to you.
Removes multiplier effect of asking for help
Breaking bad news
You have been on a training course in how to break bad news to patients and their families.
Breaking bad news
You have been on a training course in how to break bad news to patients and their families.
Time Management
You have recently been working on your time management skills and are now extremely efficient
Time Management
You have recently been working on your time management skills and are now extremely efficient
Rested
You have recently come back from a holiday and are feeling well rested.

Fire Alarm!

The practice fire alarm has gone off and everyone must evacuate

All players:

Patient cancellation

Your next patient has cancelled. Remove the next patient from your list.

This player only:

Power cut

There is a power cut within the practice but it comes back on quite quickly. Everyone is now running slightly late though

All players:

Birthday Party

It is one of your colleagues' birthday's today and there is cake and pizza in the staffroom

All players:

Birthday Party

It is one of your colleagues' birthday's today and there is cake and pizza in the staffroom

All players:

Last patient of the day cancels

Your last patient of the day has cancelled. Remove the last patient of the day from your list

This player only:

Last patient of the day cancels

Your last patient of the day has cancelled. Remove the last patient of the day from your list

This player only:

Last patient of the day cancels

Your last patient of the day has cancelled. Remove the last patient of the day from your list

This player only:

Passed the Practice Visit

The whole practice has passed the practice visitation!!

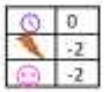
All players:

A whole family cancels

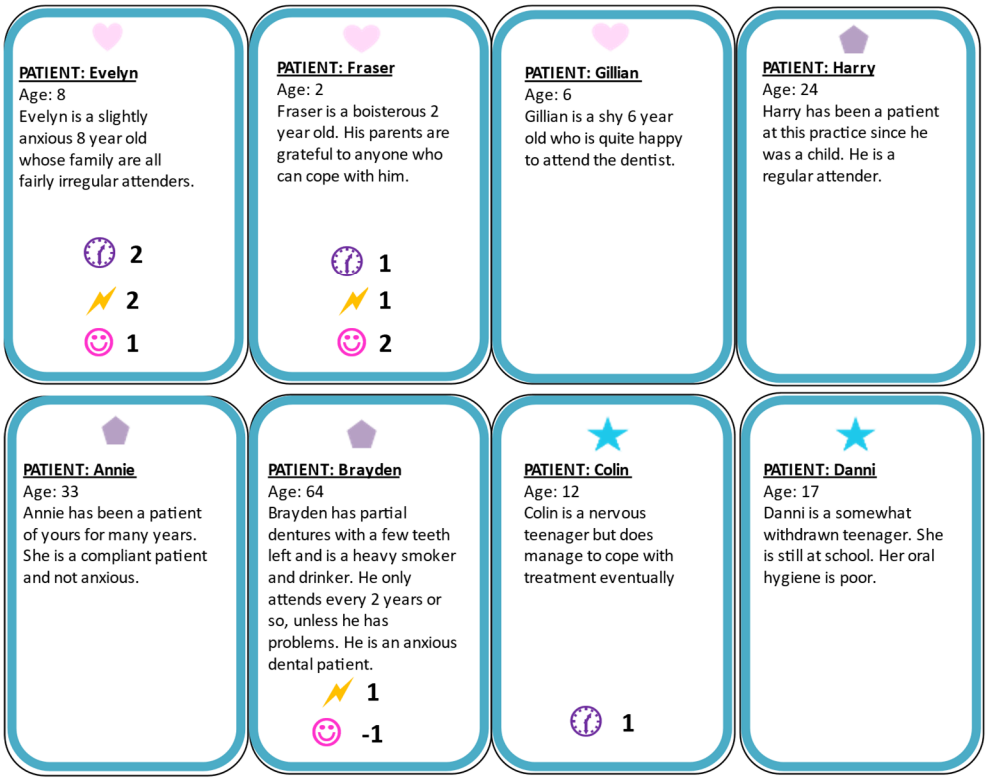
A family who were all booked in to see different dentists at the same time cancel. The next time this can happen is not for months as everyone is very booked up.

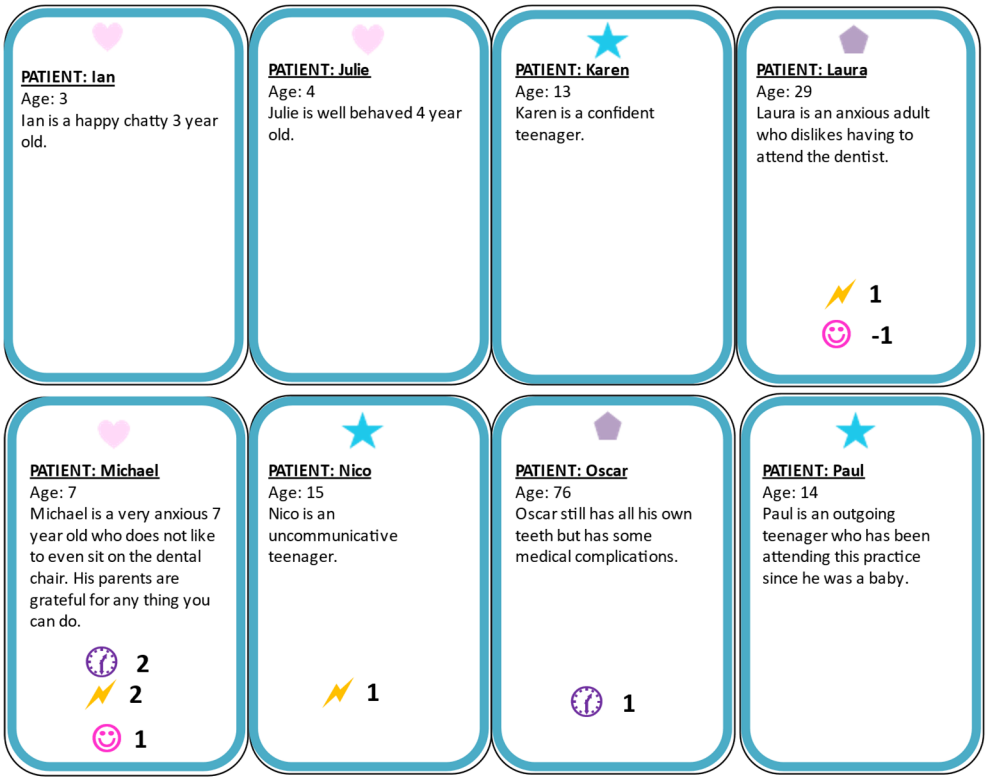
All players remove and discard their next patient.

All Players:



Appendix 11 Final Cards





PATIENT: Quentin
Age: 42
Quentin is always in a rush to get back to his work.

☺ -1

PATIENT: Richard
Age: 9
Richard enjoys school and likes to tell you all about the things he has been doing.

1

PATIENT: Susan
Age: 10
Susan does not like the dentist and cries every time she come in.

1
1

PATIENT: Tina
Age: 16
Tina likes the dentist and would like to be a dentist in the future.

-1
☺ 1

PATIENT: Ursula
Age: 55
Has been a patient for many years and many of her family attend the practice.

PATIENT: Violet
Age: 81
Violet has been a patient of the practice for a long time. She finds she is getting a bit slower these days and her mobility is reduced.

1

PATIENT: Wendy
Age: 5
Wendy is a chatty 5 year old who likes the dentist.

PATIENT: Xavier
Age: 11
Xavier is polite young man who enjoys coming to the dentist.

Mrs Alpha
Mrs Alpha has been working in this practice for 10 years. She likes things to run smoothly and works very efficiently. She thinks the absolute worst will always happen. She gets anxious if things don't go as planned, or something unexpected happens. She really struggles to make referrals as she assumes the worst thing possible will happen.

SKILLS Fast treatment
Treat task card 1 -1

CHALLENGES
Refer task card x3

Mrs Alpha

STARTING LEVELS
5 ☺ 12

Mr Bravo
Mr Bravo is a young professional who has been working at this practice for a year. He is willing to help his colleagues but feels responsible whenever things do not go as planned or he cannot resolve a situation himself. Patients really like him as he is very thorough.

SKILLS Helpful, well liked
If accept **Give to colleague** task card
Extra ☺ 4
Extra ☺ 1 for **ANY other** task card

CHALLENGES
Refer task card x2
Ask for help task card x2

Mr Bravo

STARTING LEVELS
8 ☺ 9

Dr Delta
Dr Delta is longest serving member of staff in this practice. He tends to focus on his weaknesses and overlooks his strengths. He thinks that things never go right for him, if something is going to go wrong it will happen to him! He focuses far more on that rather than that he is well liked by his patients and colleagues.

SKILLS well liked
Extra ☺ 2 for **ANY** task card

CHALLENGES
Extended exam task card extra 1
Refer task card extra 1

Dr Delta

STARTING LEVELS
4 ☺ 15

Ms Charlie
Ms Charlie has been working in this practice for 5 years. She worries that patients and others think badly of her and takes every little criticism to heart. She is very self critical of her work and has extremely high standards.

SKILLS well liked
Treat task card ☺ 2

CHALLENGES
Treat task card 1
Refer task card 1
Discuss task card 1
Ask for help task card x3

Ms Charlie

STARTING LEVELS
7 ☺ 10

Miss Echo

Miss Echo has been working in this practice for 15 years. She is very self critical and thinks she cannot tackle difficult situations. She is otherwise friendly and outgoing.

SKILLS Friendly
Treattask card 1

CHALLENGES
Refertask card x2
If **Treat Difficult extraction/ restoration**consultation card 2

Miss Echo

STARTING LEVELS

5 10

Mr Foxtrot

Mr Foxtrot has been working in this practice for 8 years. He does not enjoy treating children and young people and finds that stressful, he thinks they all hate him. He is brilliant at difficult or complex treatment and really enjoys them.

SKILLS Good at difficult treatment
If **Treat Difficult extraction/ restoration**consultation card -2

CHALLENGES
Child **Teenager** patient cards 2

Mr Foxtrot

STARTING LEVELS

6 8

Pain

This patient has been having pain for the last 24 hours. It kept them awake last night. When you examine this patient you find that amolar is carious and non-vital with an associated buccalswelling

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Root canal treatment

This patient has attended for root canal treatment on a molar

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

10

Ulcer

On examination of this patient you find an ulcer which the patient tells you has been present for 4weeks.

N. B. "Arrange review" cannot be played alone but may be played with "Extended exam"

TASK OPTIONS:
Extended exam
Arrange review PLUS Extended exam
Refer
Ask for help
Discuss
Give to a colleague

5

Bruising to face

You see what looks like a slap mark on the patient's face

TASK OPTIONS:
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Straightforward extraction required

This patient needs a straightforward extraction

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Neglect

You note multiple carious teeth with draining abscesses. You check on the computerised records system and this patient has previously required extractions under general anaesthetic

TASK OPTIONS:
Treat
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Pain

The parent accompanying this patient tells you the child has been in pain for 3weeks. This is the first time they've brought the child in in over 1 year. They've been missing school/ nursery and not eating properly.

TASK OPTIONS:
Treat
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Examination- No changes/ everything looks stable

This patient has attended for an examination and everything looksstable.

TASK OPTIONS:
Arrange review
Give to a colleague

5

Difficult extraction required
This patient has come in for an extraction and it is proving much more difficult than expected.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

7

Restoration
This patient has come in for a planned filling on one of their anterior teeth.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Trauma
This patient has had an avulsion of the upper left central incisor.

TASK OPTIONS:
Treat
Refer
Ask for help
Give tocolleague

10

Trauma
This patient has an enamel dentine pulp fracture which occurred 4 days ago. This is the first time they have been brought to see a dental professional since the injury occurred. The parent says they have been too busy to bring them.

TASK OPTIONS:
Treat
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

10

Dental neglect
This child has caries in some posterior teeth. You note in their history that there have been 3 treatment plans for restoration of these teeth over a few years but they are all incomplete because the patient is not brought to treatment appointments.

TASK OPTIONS:
Treat
Refer
Ask forhelp
Discuss
Give to colleague

5

Caries
A new family attend the practice bringing their child as the child's nursery/ school teacher expressed concern about their front teeth. On examination the incisors are decayed to the gum level.

TASK OPTIONS:
Treat
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Lost front tooth
You note that one of this patient's front teeth is missing. When you ask about this the family tell you that it was just found on the pillow one morning.

TASK OPTIONS:
Treat
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Irregular attender
You note carious cavities in most of the posterior teeth. You last saw this patient a year ago for restorations and put them on an enhanced preventive plan. The family has cancelled 4 appointments and not brought the patient to another 3 appointments in the last year.

TASK OPTIONS:
Treat
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Grip mark
You see what appears to be finger tip marks on one side of this child's mouth and a thumb mark on the other extra-orally. Intra- orally you note bruising at the junction of the hard and soft palate.

TASK OPTIONS:
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5

Restoration
This patient has come in for a planned filling on one of their back teeth.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Gingivitis
This patient says their gums are bleeding when they brush their teeth. On examination their oral hygiene is poor and you see marginal gingival inflammation throughout their mouth.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Aesthetics
This has creamy yellow/brown marks on their central incisors which they dislike.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

5

Difficult restoration required
This patient has come in for a restoration and it is proving much more difficult than expected.

TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

7

Examination- No changes/ everything looks stable
This patient has attended for an examination and everything looks stable.

TASK OPTIONS:
Arrange review
Give to a colleague

5

Pain
This patient has been having pain for the last 24 hours. It kept them awake last night. When you examine this patient you find that a molar is carious and non-vital with an associated buccal swelling

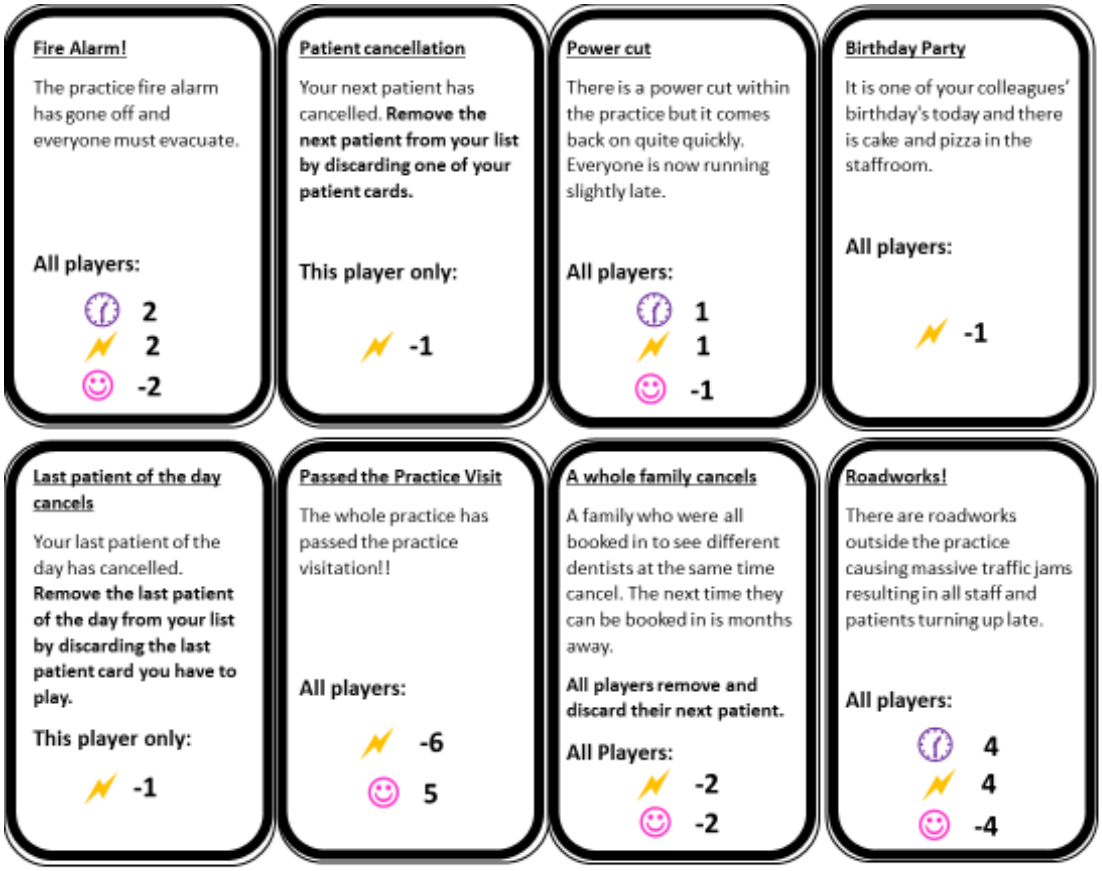
TASK OPTIONS:
Treat
Refer
Ask for help
Give to colleague

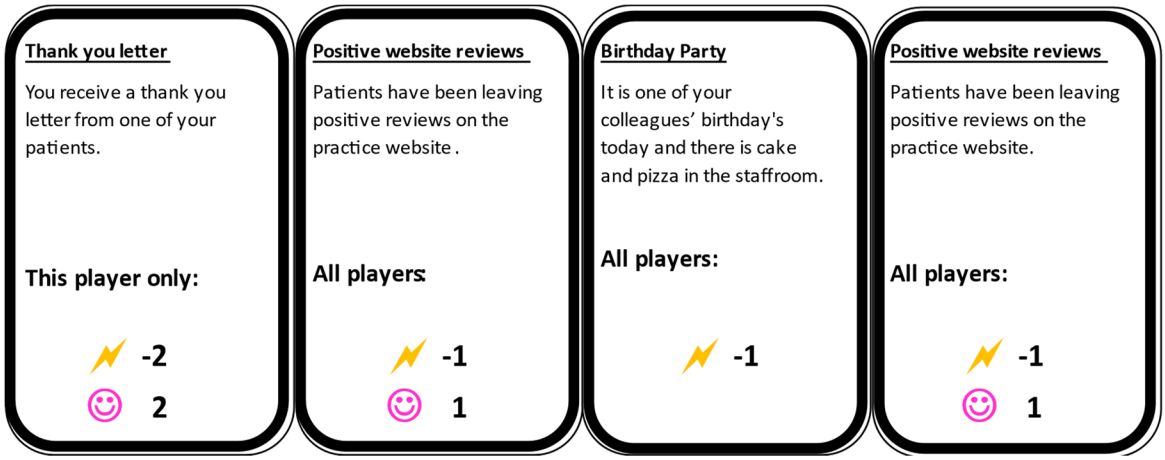
5

Neglect
You note multiple carious teeth with draining abscesses. You check on the computerised records system and this patient has previously required extractions under general anaesthetic

TASK OPTIONS:
Treat
Extended exam
Arrange review
Refer
Ask for help
Discuss
Give to colleague

5


Fire Alarm!
The practice fire alarm has gone off and everyone must evacuate.
All players:
2
2
-2
Patient cancellation
Your next patient has cancelled. Remove the next patient from your list by discarding one of your patient cards.
This player only:
-1
Power cut
There is a power cut within the practice but it comes back on quite quickly. Everyone is now running slightly late.
All players:
1
1
-1
Birthday Party
It is one of your colleagues' birthday's today and there is cake and pizza in the staffroom.
All players:
-1
Last patient of the day cancels
Your last patient of the day has cancelled. Remove the last patient of the day from your list by discarding the last patient card you have to play.
This player only:
-1
Passed the Practice Visit
The whole practice has passed the practice visitation!!
All players:
-6
5
A whole family cancels
A family who were all booked in to see different dentists at the same time cancel. The next time they can be booked in is months away.
All players remove and discard their next patient.
All Players:
-2
-2
Roadworks!
There are roadworks outside the practice causing massive traffic jams resulting in all staff and patients turning up late.
All players:
4
4
-4


Thank you letter
You receive a thank you letter from one of your patients.
This player only:
-2
2
Positive website reviews
Patients have been leaving positive reviews on the practice website .
All players:
-1
1
Birthday Party
It is one of your colleagues' birthday's today and there is cake and pizza in the staffroom.
All players:
-1
Positive website reviews
Patients have been leaving positive reviews on the practice website.
All players:
-1
1

RESOURCE:
Rested
You have recently come back from a holiday and are feeling well rested.

RESOURCE
Dealing with challenging patients
You have recently completed a training course in how to deal with challenging patients.

RESOURCE:
Resilience
You are feeling particularly resilient today and can cope with whatever the day throws at you.

RESOURCE:
Practical skills
Your practical hand skills are great today. You have been working hard recently improving in areas you felt you had less experience in.

RESOURCE:
Managing complaints
You have undertaken a managing complaints training.

RESOURCE
Breaking bad news
You have been on a training course in how to break bad news to patients and their families.

RESOURCE:
Time Management
You have recently been working on your time management skills and are now extremely efficient.

RESOURCE:

RESOURCE:
Referral
You have realised that always expecting the worse to happen is making referrals more stressful for you. You go back and review a selection of your previous referrals to hospitals and social work departments and are heartened to see that all the patients you have referred are still your patients.

Removes extra **1** for **Dr Delta** for **Refer** task card.

RESOURCE:
Referral
You recognise that you find making referrals difficult because you think that the worst possible outcome will always happen

When a referral is required you ask a colleague to help you.

Removes **x3** effect for **Mrs Alpha** for **Refer** task card.

RESOURCE
Asking for help
You recognise that you find asking for help difficult as you feel you are solely responsible for the findings during and the outcome of the appointment.

After discussing this with the other team members they have reassured you that you did not cause the patient's to have the issues that they do.

Removes **x2** effect for **Mr Bravo** for **Ask for help** task card.

RESOURCE:
Referral
You recognise that you find making referrals difficult because you feel responsible for whatever happens to your patient after referring.

You discuss with the person/ agency you are referring to what is likely to happen next and they discuss the scenario with you. You are reassured.

Removes **x2** effect for **Mr Bravo** for **Refer** task card.

RESOURCE
Referralfeedback
You recognise that you find making referrals difficult because you feel responsible for whatever happens to your patient after referring.

You get feedback about a patient that you previously referred which reassures you that you made the right decision

Removes **x2** effect for **Mr Bravo** for **Refer** task card.

RESOURCE
Asking for help
You recognise that find asking for help difficult because you worry that your colleagues and patients will think badly of you

A situation arises that you want to ask for help with and you pick a trusted colleague to ask for help. They feed back to you how much they value being made to feel useful to you.

Removes **x3** effect for **Ms Charlie** for **Ask for help** task card.

RESOURCE:
Referral
You recognise that you find making referrals difficult because you worry that the patients and families will think badly of you. You challenge your thinking as to whether this is true or not and realise that none of your patients have ever deregistered because you referred them.

Removes extra **1** for **Ms Charlie** for **Refer** task card.

RESOURCE:
Extended examination
Your thinking style is making extended examinations more difficult for you. You complete a thought identification and challenge worksheet which you use to test out if your fears are really true or not.

Removes extra **1** for **Dr Delta** for **Extended exam** task card.

RESOURCE
Discuss
You have realised that worrying how others perceive you is not helpful. You complete a thought investigation and challenge worksheet regarding you thought of " Everyone will think I'm stupid if I discuss a case at the team meeting" which makes you feel panicky. You come to a more balanced conclusion and plan how to reinforce this.

Removes extra 1 for **Ms Charlie** for **Discuss** task card.

RESOURCE
Treat
You realise that becoming so stressed when treating patients is unhelpful. You take time to note what you are thinking and feeling at the moments before/ during treatment that you feel worst. You challenge these thoughts and feelings and look for evidence that they may not be true and plan how you are going to reinforce this evidence.

Removes extra 1 for **Ms Charlie** for **Treat** task card.

RESOURCE
Difficult treatments
You have decided that you want to feel more confident in managing difficult extractions and enrol on a suitable skills course.

Removes extra 2 for **Miss Echo** for Treating **Difficult Extraction** consultation card

RESOURCE
Referral
You recognise that you find making referrals difficult because you think you cannot handle difficult situations.

You look for evidence to support this thought and realise that you have managed every difficult situation that has presented itself before and got through it.

Removes x2 effect for **Miss Echo** for **Refer** task card.

RESOURCE
Children and Teenagers
You have decided that you will explore why you dislike treating children and what it is you find stressful about it. You complete a thought investigation and challenge worksheet the next time you notice you have felt stressed when treating a child/ young person and put into practice some methods of being calm when treating children/ young people.

Removes extra 2 for **Mr Foxtrot** for **child/ teenage patient cards**

TASK: Treat
You have decided to treat this patient. 5 / 0 / 2

Cost to resolve: 1 Resource card

Resolved : 1 Event card
1 Resource card
Unresolved: 1 Event card plus additional 2 / 2 / -2

TASK: Extended exam
You wish to do an extended exam. 5 / 0 / 1

Cost to resolve: 1 Resource card

Resolved: 1 Event card
1 Resource card
Unresolved: 2 Event cards plus additional 2 / 2 / -1

TASK: Arrange review
-1

Cost to resolve: 1 Resource card

Resolved: 1 Event card
1 Resource card

Unresolved: 1 Event card plus additional 1 / 1 / -2

TASK: Refer
1 / 1 / -2

Cost to resolve: 2 Resource cards
Resolved: 1 Event card
2 Resource cards

Unresolved: 1 Event card plus additional 1 / 2 / -2

TASK: Discuss
This player **All** others
1 / 0 — 1

Cost to resolve: 2 Resource cards (can be from any players)

Resolved: All players **1 Resource** card each

Unresolved: This player 1 Event card

TASK: Ask for help
This player **AND Player helping**
1 / 1

Cost to resolve: 1 Resource card from player asking for help, **1 Resource** card from player agreeing to help.

Resolved: 2 Event cards
1 Resource card
Unresolved: 1 Event card plus additional 2 / -2

TASK: Give to colleague
-3 / -1

Cost to resolve: 1 Resource card from player giving patient away, **1 Resource** card from player accepting patient

Resolved: 1 Resource card to each player involved
Unresolved: 1 Event card plus additional 3 / -2

Appendix 12 Game Evaluation Protocol

Protocol for Evaluation of Serious Game Designed to Address Fears involved in Child Protection Concerns of Dental Professionals.

PhD student/ Lead Investigator:

Christine Park

Part Time PhD Student School of Simulation & Visualisation, Glasgow School of Art

Senior Clinical University Teacher/ Honorary Consultant in Paediatric Dentistry, Glasgow Dental Hospital & School, University of Glasgow

PhD Supervisors:

Dr Sandy Louchart, School of Simulation & Visualisation, Glasgow School of Art

Prof Richard Welbury, Glasgow Dental Hospital & School School, University of Glasgow

Rationale and Background Information

Despite increases in the amount of child protection training available for dental teams since 2006 there remains a 26% gap between the proportion of general dental practitioners who have suspected child abuse or neglect in one or more of their paediatric patients (37%) and the proportion who had referred suspected cases (11%) (Harris et al, 2013). This gap between suspicion and referral is not unique to Scotland. Previous work (Welbury et al, 2003) elicited background issues (including isolationism, lack of holistic approach to patient care and attitudes to further training and professional development), perceptions and behaviour in child protection issues and inhibiting and motivating factors in child protection (difficulty in identifying abuse, concern about the outcome and need for certainty before action). Since then quantitative methods have consistently shown that the gap between dentists who suspect and refer in Scotland is affected by lack of certainty of the diagnosis, fear of violence to the child, fear of consequences to the child from statutory agencies, lack of knowledge of referral procedures, fear of litigation, fear of violence to the general dental practitioner and concerns of impact on dental practices (Harris et al., 2013, Cairns et al., 2005). However dental professionals are not the only healthcare professionals to have a gap between those who suspect and those who refer. The gap still exists despite many of the identified fears being targeted by training so it is clear that all the factors involved in the decision by a dental professional to refer are not yet fully understood. This then begs the question as to why it would be important to address the gap at all? The answer lies in the assumption that all the children for whom dentists have suspicions must have some welfare concerns, or else the dentists would not be suspicious. Consequently, if all the children for whom dentists were concerned were referred to appropriate agencies then many more children could have their welfare protected and promoted. That would benefit the individual child (prevent morbidity and mortality) and also benefit society. All types of abuse and neglect are associated with poorer mental health and other longer-term health consequences (cancer, chronic lung disease, fibromyalgia, irritable bowel syndrome, ischaemic heart disease, liver disease, reproductive health problems). In light of this if you can identify and refer children as early as possible the benefits to society could be vast.

The first part of my PhD research aimed to discover what is involved for dental teams in the decision to make a child protection referral. I undertook 18 in-depth interviews with members of dental teams throughout Scotland, transcribed them verbatim and undertook thematic analysis. This work provided a variety of themes, one of the overriding ones being “fear” including fear of making the wrong decision. It also highlighted the importance of team working in potential child protection concerns. From this work I designed and created a serious game based loosely based on the structure of a day in general practice. The importance of play in the learning process has been discussed for decades. There is general agreement that learning through play is an efficient way to learn and game-based approaches have provided valuable contributions to many health domains. However, game-based health interventions are often targeted at patients or parents of patients rather than at practitioners or students.

‘Serious Games’ allow players to engage interactively and cognitively with content. They are often used in order to reach out to an audience that would often find it difficult to engage with a topic or understand complex causal problems. A game can break down these complex problems over time and allow players to reflect on the game, its premise, their in-game behaviours and own real-life behaviours regarding these problems. Consequently, a serious game can have a major role in education in areas of the curriculum that require engagement and reflection.

Using the key information from the thematic analysis of the interviews, a list of criteria and skills that could be developed through serious game play was compiled. We also created a shortlist of existing table top games with promising characteristics on which to base our game.

Matching the game actions, or ‘game mechanics’ to specific learning outcomes is a key element of serious game development for game-based learning. Using an approach called ‘Learning Mechanics-Game Mechanics’ we matched different learning verbs from Bloom’s Taxonomy with different game mechanics, or game actions. This is a collaborative game where all players need to help each other for the team to stay in the game. In the game all players are working in a dental practice. Each players’ character has traits of “disordered thinking” and there are resources available in the game based on the “Five Areas” approach from cognitive behaviour therapy which is a well-researched method of tackling fear and anxiety (Williams CBT reference) .The aim of the game is to get through the working day in the available time, balancing your character’s stress levels and patient satisfaction levels. If any player reaches the ‘fail zone’ of stress or patient satisfaction the game is over for everyone. The collaborative nature of the game means that all the players must work together, sharing resources and helping each other with tasks that each character finds difficult, including referring a child patient because of concerns regarding neglect.

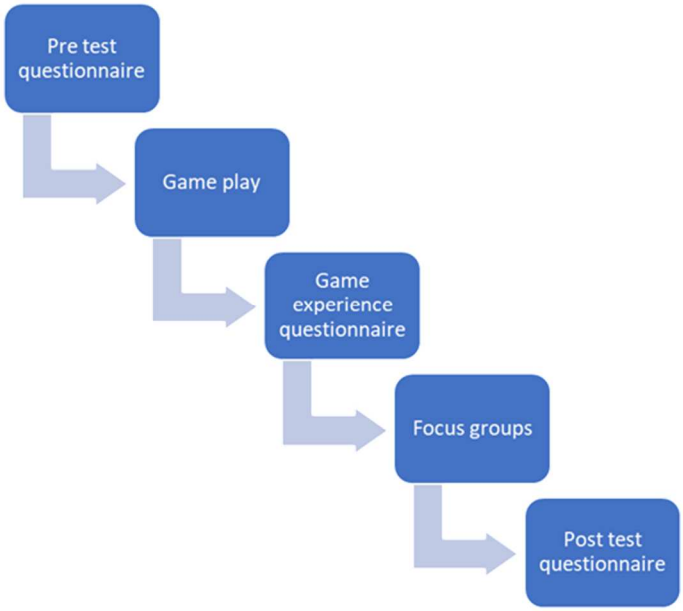
The game facilitates discussion and reflection about why some people find it difficult and what colleagues can do for each other to support each other making referrals. It shows parallels between other areas of professional life where decisions must be made and helps lessen or reduce the anxiety around concerns over child protection or abuse. The game has been designed as a light entertainment game that can be played as part of a workshop or CPD session. The game should be played first and provides cases for discussions later in the workshop. It helps to contextualise the discussion around child protection whilst still allowing relevance to players by featuring a familiar setting (dental practice).

The game has undergone play testing with current serious game design students at Glasgow School of Art and with groups of dentists and current/former dental students.

Study Goals & Objectives

This goal of this study is to evaluate the serious game that been developed. I am interested in whether there is any change in attitudes from before to after playing the game as well as whether the game actually works as a vehicle to help facilitate students and dental team members' reflection. We will also assess the impact of the approach. The type of impact I am looking for is evidence of reflection on previous experiences or considerations of what participants would do in their real working lives if any of these situations occur, and discussion or acknowledgement of how decisions can be influenced by time, stress, patient opinion and the larger team.

Study design



There are three elements to the evaluation, namely a pre and post-test questionnaire, a game experience questionnaire and focus groups. The questionnaire used for both pre and post- tests has been piloted and tested for validity and reliability. Pre-tests will be distributed 2 weeks before the game play sessions. Game play sessions will last approximately 60 minutes directly followed by the game experience questionnaire. The Game Experience questionnaire has previously been validated and used for board games. There will then be a break and focus groups will follow directly on from the game play sessions. The focus groups will be made up of a maximum of 6 participants and there will be a maximum of 4 focus groups. Post-tests will be distributed to participants 6 weeks after playing the game.

Recruitment of participants

All final year dental students at Glasgow Dental Hospital and School will be invited to participate in playing the serious game under investigation. Participation will be voluntary although it is recognised that as the researcher is a member of University staff there are ethical considerations of a dependent relationship (teacher-student). All potential participants will be provided with a participant information leaflet prior to providing voluntary informed consent if they wish to take part in the research. There are between 70 and 80 students in final year at Glasgow Dental Hospital. The aim is to recruit 12 to 24 students to participate in the evaluation (up to 6 can play the game at any time). Participants will be free to withdraw at any time during the study duration. It is recognised that the timing of this research is an important ethical consideration because if the students were to express low levels of perceived confidence and knowledge this could be distressing to them, and sufficient time should be available to them to address their concerns between the period of the research and their final OSCE examination which is

acknowledged as a high stakes examination. For this reason the research will be done at the beginning of the students' final year when all of their formal teaching in child protection is complete but there is still sufficient time to address any perceived concerns about confidence or knowledge regarding the subject. Participants will be recruited by an email invitation sent to all the BDS 5 dental students.

Recruitment and Pre- tests 16th July – 26th July

Play tests, Game Experience questionnaire and focus groups 29th July -9th August

Post-tests 9th -20th September

Analysis of results 23rd September to 26th October

Methodology

Child protection is a complex area and there is no published evidence to suggest that one way of teaching it is better than the others. Current teaching methods include lectures, small group scenario-based teaching, online modules and intense full day training such as the National Child Protection Recognition and Response training. My previous qualitative interviews demonstrated a desire for teaching/ training in this area to be done in teams and dissatisfaction with currently available training (PhD research, not yet published).

Safety Considerations

The venue for the focus groups has been chosen as University tutorial rooms in Glasgow Dental Hospital & School during working hours when other staff members and students will be around.

Data management & Analysis

Data from the pre and post-test questionnaires will be entered into SPSS and the baseline mode and frequency from the pre-tests for each question will be compared to the mode and frequency of the post-tests.

Data from the game experience questionnaire will be compared to existing data on normative values from other games.

The focus groups will be audio recorded and the recordings kept on an encrypted USB stick before being transcribed verbatim with all identifying factors removed. Transcripts will then be thematically analysed. Original audio recordings will be kept for 1 year post PhD viva and the transcriptions kept for 10 years. Personal data will be kept on an encrypted USB stick and paper copies of consent forms will be kept in a locked filing cabinet in a locked staff office in Glasgow Dental Hospital and School. To ensure confidentiality of personal data a unique code identifier system for pseudonymisation of the data will be used which will not be shared with anyone else. No third party will have access to this code.

Quality Assurance

As this is a PhD study the scientific quality review has been undertaken by the researcher's supervisors and through review by the Glasgow School of Art (GSA). A regular supervision arrangement with the supervisory team is in place as well as annual review and progression events as part of student progress through Glasgow School of Art. At the progression events representatives from the supervisory team (made up of supervisors from both the GSA School of

Simulation & Visualisation and Glasgow Dental School) as well as NHS Education for Scotland will attend.

Expected outcomes of the study

The study will evaluate the serious game that been designed.

The data from the pre and post-test questionnaires will be quantitative and used to look for a change in the post test values compared to the pre-test values. This data will be used to look for any evidence of a change in attitudes.

The focus group data will be transcribed and thematically analysed. In this data I will be looking for evidence of how the game has potentially addressed fears, discussion of the CBT element is included in the topic guide. Additionally, in the focus groups I am looking for evidence of reflection on previous experiences or considerations of what participants would do in their real working lives if any of these situations occur, and discussion or acknowledgement of how decisions can be influenced by time, stress, patient opinion and the larger team

Dissemination of the results & publication policy

Results will be published and disseminated in scientific journals. If participants wish to be informed of the results they will be emailed to the participants. Any results which will impact on policy will be communicated to the relevant policy makers. Any results which will impact on teaching and curricula of the dental undergraduate students will be communicated to the relevant teaching committees.

Duration of the project

Recruitment: 16th July to 26th July

Data Collection: 27th July- 20th September

Analysis of results: 23rd September to 26th October

Problems Anticipated

As this study is a part time PhD project the timeframe will have to be adhered to but this is often tricky when balancing a clinical profession. The solution to this will be careful planning and undertaking of all tasks involved and early identification of any issues that may set back deadlines. A further problem may be in the recruitment of participants. As this is mixed methods research the minimum number of participants that would be felt adequate to evaluate the game in the focus groups is 12 with a maximum of 24. This seems to be a reasonable achievable target but it may change if data saturation is reached early.

Project management

PhD student and Chief Investigator: Mrs Christine Park

Academic Supervisors: Dr Sandy Louchart, School of Simulation & Visualisation, Glasgow School of Art

Prof Richard Welbury, Glasgow Dental School, University of Glasgow

Research Sponsor: Glasgow School of Art Research & Graduate School

Ethics

Participants will be invited to participate and the researcher will go through an information leaflet with them to help them to decide whether they wish to participate. Only if the participants agree of their own free will and sign the consent form will the questionnaires and focus groups proceed. No pressure will be placed upon participants and they are free to withdraw at any time. If a participant decides to withdraw no part of their contribution will be used in the research. Discussions around concerns about paediatric patients may bring up concerns or distresses. The focus group facilitator is trained to refer participants onto appropriate services should any unresolved issues arise. For example the interviewer may refer the participant to their local child protection services.

If participants find topics embarrassing, sensitive or upsetting the focus group can be stopped at any point that the participant requests. The facilitator is an experienced paediatric dentist who can give advice regarding self-referral onto local counselling services, student support services, occupational health or other suitable qualified professionals as may be found necessary. It will be made clear to participants at the start of focus groups that although the focus groups are confidential, if anything is said that would suggest a child or any other patient or person's safety is at risk then those comments cannot be kept confidential but will be reported to the appropriate agency. This would be the only reason the list of participants against the focus group lists would be used to identify a participant.

The study has been deemed not to require NHS ethics approval, but ethics approval has been sought from the Glasgow School of Art and from the School of MVLS at Glasgow University.

Appendix 13 Evaluation Participant Information Sheet

Title of study

Evaluation of a Serious Game for Training in Safeguarding / Child Protection

Invitation

It is widely known that there is a gap between the proportions of dental team members who suspect child abuse and neglect in paediatric patients and the proportion who go on to refer suspected cases. One of the reasons that dental team members struggle with this topic is due to fear. We have developed a serious game to be used as a tool in the teaching and training of dental team members in safeguarding / child protection. We are proposing to evaluate this serious game. We would like you to take a few minutes to read this information leaflet before deciding if you would like to help us with this research.

What is the purpose of the study?

The aim of this study is to evaluate the serious game designed for use in the teaching / training of dental teams in safeguarding/ child protection. We are aiming to identify the strengths and weaknesses of the game, whether it affects attitudes of dental team members with regards to safeguarding/ child protection and how it may do this.

Why have I been invited to take part?

We are asking you to take part in the research because you are either a qualified member of the dental team or studying to become a qualified dental team member and you have been given the opportunity to play the serious game being researched. We believe you can provide important information to us that is relevant to the evaluation that we are undertaking.

Do I have to take part?

Participation is entirely voluntary. We would like you to consent to participate in this research because we believe you have an important contribution to make. If you do not wish to participate you do not have to do anything in response to this request and you are still very welcome to play the game.

What will happen if I take part?

If you are happy to participate in the research we will ask you to read this information sheet, sign the consent form and return it to us. You will then be given a questionnaire to complete before playing the game. Immediately after playing the game you will be given another questionnaire to complete and then sent a follow up questionnaire approximately 6 weeks later which we ask you to return to us. You will also be invited to participate in a focus group with others who have played the game.

What are the possible benefits and risks of taking part?

Whilst there may be no personal benefits to you of taking part in this study the information you provide will be beneficial in the development of this serious game, with the overall aim of assisting in safeguarding/ child protection. You will be asked questions about your attitudes towards safeguarding / child protection and discussing this can be upsetting for some people your answers will be kept confidential. As everyone will have had different experiences there are contact details for organisations that can help

attached to this leaflet should you be upset by any of the questions asked in the questionnaire or during the focus groups.

Will my taking part be kept confidential?

All information you provide to us will be kept confidential. Only members of the research team will have access to this information. All data collection, storage and processing will comply with the principles of the Data Protection Act 2018. Information arising from the evaluation will only be made public in a completely unattributable format or at the aggregate level to ensure that
no participant will be identified. We must however inform you that if you disclose information that may result in you or anyone else being put at risk of harm we may have to inform the appropriate authorities. If this situation arises we will discuss all possible options for ourselves and you before deciding whether to take any action.

How is the project being funded?

This PhD is funded by NHS Education for Scotland.

What will happen to the results of the study?

All information provided by you will be stored anonymously on a password protected computer with analysis of the information obtained undertaken by the research team based at The Glasgow School of Art and The University of Glasgow. The data will be stored in archiving facilities in line with the Glasgow School of Art and the University of Glasgow retention policies of up to 10 years. Your data will form part of the study result that will be published in expert journals, presentations at regional, national or international conferences and student theses. Your name will not appear in any publication. Anonymised direct quotes from the focus groups will be used in resulting publications and reports.

Who should I contact for further information?

If you have any questions or require more information about this study, please contact me using the following contact details:

Christine Park [redacted]
The Glasgow School of Art- School of Simulation and Visualisation,
The Hub, Pacific Quay, Cessnock, Glasgow G51 1EA
0141 566 1450

What if I have further questions, or if something goes wrong?

If this study has harmed you in any way or if you wish to make a complaint about the conduct of the study you can contact GSA using the details below for further advice and information:

Dr Sandy Louchart [redacted]
The Glasgow School of Art- School of Simulation and Visualisation,
The Hub, Pacific Quay, Cessnock, Glasgow G51 1EA
0141 566 1450

The Glasgow School of Art (GSA) is committed to producing research and knowledge exchange that is of the utmost rigour and of the highest quality. Please refer to our

Research and Knowledge Exchange Ethics Policy at the following link: http://www.gsa.ac.uk/media/861048/gsa-research-ke-ethics-policy-2016.pdf; For further information or to make a complaint contact: Colin Kirkpatrick, Head of Research and Enterprise, The Glasgow School of Art, [redacted]

Thank you for reading this information sheet and for considering taking part in this research. Please keep this sheet for future reference

Contact details for relevant helpful organisations

Parentline: 08000 28 22 33
NSPCC: 0808 800 5000
Breathing Space: 0800 83 85 87
https://www.mygov.scot/report-child-abuse/

Appendix 14 Evaluation Consent Form

Research Project Title: **Evaluation of a Serious Game for Training in Safeguarding / Child Protection**

Lead Researcher: Christine Park

Contact Details: [redacted]
School of Simulation & Visualisation, Glasgow School of Art, The Hub, Pacific Quay, Cessnock, Glasgow G51 1EA

Please initial boxes

1. I confirm that I have read and understand the participant information sheet for the above study; ☐
2. I have had an opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
3. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, without my legal rights being affected. ☐
4. I agree to my focus group being audio recorded and understand that these will be kept anonymous and destroyed within 12 months of submission of the PhD thesis ☐
5. I understand that the recorded focus group will be transcribed word by word and the transcription stored for up to 10 years in Glasgow School of Art archiving facilities in accordance with data protection policies and regulations. ☐
6. I agree to the transcription of the audio recordings being made publicly available in publications, presentations, reports or examinable format (dissertation or thesis) for the purposes of research and teaching – I understand that these will remain anonymous; ☐
7. I agree for the data I provide to be anonymously archived in the Glasgow School of Art data repository (RADAR) and that other researchers can have access to this data only if they have scientific and ethical approval, and agree to preserve the confidentiality of this information as set out in this form for *future* research or teaching purposes. ☐
8. I agree to take part in the above study. ☐

9. I am happy to be contacted about any future studies and agree that my personal contact details can be retained in accordance with the Data Protection Act 2018 ☐

Name of participant	Date	Signature
Name of person taking consent (if different from researcher)	Date	Signature
Researcher	Date	Signature

Appendix 15 Ethical Approval for Evaluation

THE GLASGOW SCHOOL OF ART

25 July 2019

Dear Christine Park

Following our review of your Preliminary Ethical Assessment Form for your project, 'Evaluation of a Serious Game for the Teaching/ Training of child protection/ safeguarding to dental teams', your evaluation protocol, participant information materials and consent form, I am pleased to confirm that your planned research activities have been approved by the GSA Research Ethics Committee, and you may proceed on the basis you have described.

Should there be any significant changes to your methodology or approach during the project, that would necessitate further ethical review, please raise this with your primary PhD supervisor as soon as possible.

We hope that the next stage of your research generates useful insights and data, and look forward to hearing more about the outcomes in due course.

Yours sincerely

[redacted]

Colin Kirkpatrick
Head of Research and Enterprise
The Glasgow School of Art

PROF. IRENE MCARA-MCWILLIAM
Director

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Appendix 16 Evaluation Permission from Dean of Dental School

University of Glasgow

Dental School

22nd July 2019

Mrs Christine Park
Senior Lecturer in Paediatric Dentistry
The University of Glasgow Dental School
378 Sauchiehall Street
Glasgow
G2 3JZ

Dear Christine

Re: Evaluation of serious gaming tool for the teaching of child protection

I write to provide permission for you to run the evaluation of the tool you have developed as part of your PhD project among students at the University of Glasgow Dental School, once all appropriate ethical approvals have been provided.

Best wishes

[redacted]

Jeremy Bagg

Appendix 17 Pilot Evaluation Questionnaire

N.B Items 3, 4, 5, 6, 16, 17, 18, 19 and 20 were reverse scored

Questionnaire for attitudes towards safeguarding/ child protection concerns

Thank you for helping with the pilot testing of this questionnaire which is going to be used to help evaluate a game I have designed to help with teaching of safeguarding/ child protection to dental teams.

Please read each statement and indicate whether you "strongly disagree", "disagree", "neither agree or disagree", "agree" or "strongly agree" by circling the relevant response.

I would find it easy to report a suspected case of physical child abuse	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I would find it easy to report a suspected case of child neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I would find it difficult to report a suspected case of physical child abuse	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I would find it difficult to report a suspected case of child neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am fearful of reporting a suspected case of child abuse / neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am anxious about reporting a suspected case of child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am confident I would be able to report a suspected case of child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am confident I would be able to refer a suspected case of child abuse / neglect appropriately	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am confident I can identify the signs of physical child abuse	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am confident I can identify the signs of child neglect	1	2 disagree	3	4 agree	5 strongly agree

	strongly disagree		neither agree or disagree		
I am confident I know how to raise concerns about child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am confident I can recognise my legal responsibilities regarding child abuse/ neglect	1 strongly disagree	2 disagree	3 Neither agree or disagree	4 agree	5 strongly agree
I am confident I can act on my legal responsibilities regarding child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I can recognise my ethical responsibilities regarding child abuse / neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I can act on my ethical responsibilities regarding child abuse /neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am worried about getting things wrong if I suspected child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am worried about missing cases of child abuse / neglect in my paediatric patients	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I fear identifying suspected cases of child abuse/ neglect	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I fear my patient's opinion of me	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree
I am anxious about my patients' opinion of me	1 strongly disagree	2 disagree	3 neither agree or disagree	4 agree	5 strongly agree

I have some further questions about this questionnaire and would be grateful if you would answer below:

1. Are the name of questionnaire and the items asked acceptable? Yes/ No
   Any comments?_____

2. Is the scale used acceptable? Yes/No

Any comments?_____

3. Would this measure a person's attitude towards safeguarding and child protection? Yes/No
   Any comments?_____

4. Are any questions offensive, inappropriate to ask or irrelevant? Yes/No
   Any comments or indicate which questions?_____

5. Are the questions clear? Yes/No
   Any comments?_____

6. Any further comments?_____

Thank you for your time!
Christine Park

Contact: Christine Park [redacted]

Appendix 18 Focus Group Topic Guide

Focus group Topic Guide

Stage 1:

Welcome and thank you for coming *(Put at ease with friendly conversation)*

Once all have arrived- More formal start with personal introduction, outline of research topic, background information on purpose of study and its funder

So as you know I am Christine Park and I am evaluating the serious game that I have designed which you all have recently played. The game was designed in response to interviews I undertook with dental team members across Scotland who expressed a desire for a different type of training in child protection rather than the usual lectures.

(Stress confidentiality and voluntary nature of participation)

Explanation of what will happen to the data and how findings will be reported and disseminated

This focus group will be in form of discussion and please do not wait to be invited before contributing, everyone's views are of interest and my aim is to hear as many different thoughts as possible. Feel free to say what you think and if you agree or disagree with others.

This session is audio recorded for my benefit. I will transcribe the session and ensure all names or other identifiers are removed. Please try to avoid using names if possible but don't worry if you do as I will remove them. Please don't talk over each other so that I can transcribe.

Stage 2:

Individual introductions

Brief comment about composition of the group as a whole, noting similarities

Stage 3*: (Recording begins)*

Opening topic

Please tell me your initial thoughts / impressions of the game

(Neutral, general easy to talk about or more conceptual that want spontaneous thoughts)

Stage 4:

Discussion

Characters

Patients

Scenarios

Resources

Events

Collaborative nature of the game

Time

Stress

Patient satisfaction

How did it make you feel? Why?

How has it influenced you? Why?

What will you take away?

What will you change having played this game?

What will you do differently having played this game?

What applications do you think this game has?

(Keep mental note of what is being said and probe group as a whole and individual members using open questions)

Stage 5:

Ending the discussion

Is there anything else anyone wants to say before we finish? Is there anything we've left out you want to discuss?

Finish on a positive and completed note. End and thank, stressing how helpful

Appendix 19 Focus Group Transcripts

Focus Group 1

I: Em, so the opening topic is really, em, if you could just tell me what your initial thought or impressions of the game were.

F1: Um, for me, eh, at first I thought it looked complicated, by then when I, when we started playing the board game it was actually pretty simple. Yeah, and quite enjoyable to play.

M1: Mmhm, yeah so after we had one or two rounds of the game I found that, eh, I was really enjoying it, I was enjoying it the whole way through and I found that I was able to follow the rules and follow the steps, em, and I found it particularly relevant and interesting to myself as a dental student.

I: OK, em in particular what did you think about the different characters that you got the opportunity to play, or that you saw other people playing?

F1: Um, I thought they were quite realistic, like, um, obviously different characters have different strengths, different, um, challenges and, um, I just thought it was ,like, well thought of basically the different characters, yeah.

I: OK

M1: I liked that they all had, em, a different backstory, a different, em personalities, different attributes, em, I felt especially that you could see some of these attributes in myself and others that I could see in , I could imagine in other people and how the situations would turn out specifically.

I: So what sort of things?

M1: So in terms of some people being, eh, worried to treat children, some people being worried to ask for help or refer, em, some people particularly being self-critical, em, all these different things that would add to their stress level, but then in a real life situation I can see how not working on those human factors that would play into your own practice, or play in a real life situation so it made it very interesting. I liked the try of different characters with each round.

F1: Yeah, also some people are good at, like, difficult restorations or difficult extractions and obviously that would take them less time and cause them less stress than others.

M1: mmhmm

F1: which is nice

I: What sort of similarities did you see with yourselves then?

M1: So, eh, I guess focussing on, focussing on weaknesses and not so much focussing on strengths

F1: Yeah

M1: Em, being worried about doing difficult procedures for sure, I imagine that would put stresses up. Em…and maybe, maybe having a difficult time with wanting to refer or ask for help with colleagues. I imagine those type of things I could see, mmhmm.

F1: And for myself, um, being stressed around children and teenagers. I don't know why, but, um, maybe it has something to do with them, wanting them to like me (laughs).

M1: I thought as well with the characters it was good with the game mechanics that then because people had different strengths and weaknesses you can then start to implement that working as a team, and thinking "oh well this person can work with this patient really well, maybe I should ask them for help?" And so

that was good, maybe that translates into real life situations as well where you know people have different strengths and weaknesses.

I: OK and moving on from the characters, what did you think, or what were your opinions about the different sort of patients that were in the game?

M1: So I really enjoyed all the different patients. I thought it was good there seemed to be a lot of variety, em, and a lot of different, eh, opinions that they would have of you and how that would affect just slightly different things with your management of them. Em, I felt that if it was to do with child protection and things I thought that maybe more of that could have come up, I don'y know if it was just the cards that we picked up, but I felt that more of those situations presented to myself would have been helpful.

I: Ok, yeah.

F1: And um, yeah different patients have obviously different personalities and they contribute differently to your day and I guess, like, how anxious patients are, or how they interact with you can affect, like, your patient satisfaction or your stress levels or even take more time up in your day, that was, like… I don't know the word for it, but like, em, it was just realistic I guess, yeah.

M1:Again with that I think, going back to the variety of the patients I guess if I could imagine in a real life scenario you're gonna get different things coming in the door, all the time and so I felt like that was good, you know when you're pulling up a card you're like "oh I've got this today and who knows what's going to come up" so I thought that was interesting.

I: And, em, the sort of scenarios that came up in the game, what did you think about them?

F1: I thought they were like, um, things that you would expect to get in a normal dental practice in a day, like pain or abscesses or difficult restorations. I didn't really come across anything that you wouldn't see which is good for the game.

M1: Yeah definitely it was all very relevant, em, very interesting as well, I think, when you would pull something out and go "oh so this is what I'd have to do today". I liked that different scenarios matched different patients so obviously it then sort of tied in , it seemed to go well together. Em, and so then because there were so many different scenarios it would play in to how you would, you were then thinking about lots of different things that you would do, eh, and it was covering a lot of aspects of, sort of, practice.

F1: I like how the symbols on the scenarios matched to different kinds of patients like child, teenager, adult and like obviously the adult card wouldn't match, wouldn't be compatible to be played with a child and that was good.

M1: Yeah it allowed it to all, sort of, make sense as you played it then, you were able to place yourself into that type of scenario.

I: And the options that you had for the, em, the tasks that you could do, what did you think about them? Did you think it was realistic or did you feel they were a bit limiting or not really what you would have done or what did you think about the tasks?

F1: They were really the textbook options, aren't they? Treat, refer, review, not really much other option I think.

M1: Uh-huh, I think they were all realistic options and it was fun to use them all. I thjnk in terms of, just for fun of the game I think it would have been good if there was more pressure to cooperate, just like swap patients round and sort of discuss things so if there was more incentive to do that, rather than treat, I think it would be more fun, like as a game thing but I think realistically the treat option was what was going to come up a lot of times. So you know it made sense to do that.

I: How do you feel that kind of related to what you see or what you would expect to see or, and do, in your sort of day to day practice? Those options?
M1: Em, yeah I felt like these scenarios all sort of covered things that would come up in practice. Em, and I guess it was useful, em to see, with options like "discuss", "give to a colleague", how that would then affect time and stress levels and for specific people and how that would work so , not only illustrates what you could do in that situation but how its going to affect, maybe human factors in your practice, things that would go on.
F1: Um, well obviously for the treat card just now, it all had the same, like for almost every task it took the same time, it took the same amount of stress and patient satisfaction, but obviously that wouldn't be the same in real life, yeah. But I guess it would be hard to incorporate that into the boardgame I guess, but realistically some treatments would tale less time or more time and, ah, depends how well you do as well, it in terms of patients satisfaction.
I: Yeah, OK. Em, so some of the cards, the yellow cards in it, were your resource cards, eme, did you read any of the staff that was on any of the resource cards?
F1: I did.
I: And what did you think about the sort of resources that were there for you?
M1: So, em, I liked the resources, I liked how theses are things that you could use as a resource yourself. Things about, em, taking a training course in patient management or giving bad news, things like that. And then when you had resource cards specific to certain characters, so, em, I don't know, character A would be stressed about dealing with children, then you would luckily get a resource card that said they'd started to think about why they have trouble with that and so they would reflect and put it in a challenge worksheet and so that reduces your stress. I feel like its good, it kind of illustrates to myself, maybe subconsciously or whatever, that, you know, if there's challenges, personal challenges within myself, that can be solved and these are maybe types of ways that that can be resolved.
I: Is that, that sort of resource, that sort of challenging your sorts of thoughts and things, is that something you'd come across before?
M1: In everyday life?
I: Yeah or in anything you've done or found difficult? Is that the sort, is that something that had been suggested or that you'd come across before, or?
F1: Given my limited experience, not yet, but I think it would appear at sometime in the future.
M1: I think throughout the uni course, em, a lot of, a lot of emphasis has been on reflection and why reflection is important, especially as practitioners, you know everyday you need to be thinking about what went well, and what went wrong but have a healthy balance of that as well. Being able to be constructive with it, without damaging yourself cause you could, I imagine you could reflect and just say "oh I'm terrible at this and terrible at that" and so its not helping you, so I guess it kinda illustrated what good reflection is, in a sense.
I: Yeah so the sort of challenging those sort of thoughts and things.
M1: Yeah, yeah to be able to challenge those thoughts and how by challenging those thoughts that became helpful to that person.
F1: Like for my character just now, Mr Foxtrot, he was stressed when he deals with children and teenagers but, I luckily had the resource card that says, like he looked into it and, like actually researched and found out about calming techniques or whatever, I don't remember. Like techniques he could use to manage his stress around child and teenagers and then, um, that helps reduce

the extra stress round it, children and teenagers and that was actually very … I don't know was it lucky or?? I guess what I'm trying to say is there's a solution to the stress whereas some people would just, like accept they'll be stressed around children and teenagers.

I: and you had mentioned that that's something sometimes you feel a wee bit stressed about, was something like "Oooo!"

F1: Mmm, there's something I can do about that! (laughs)

I: Ok, good. Em, so one of the other cards in it was the events cards, the black cards, em what did you think about those?

M1: Those were fun! (laughs) I really enjoyed that! Yeah it was a bit of the unexpected, the excitement

F1: suspense

M1: And then oooo, right ok well we all have to do this and eh, so that was a fun part came out of nowhere and it was always at the end so it added things and it also, I think, just gave good examples of things that can happen, things that can go wrong, things that can go well and just

F1: Yeah things that are out of your control basically. Um, you never know what might happen and I guess you need to be prepared for that.

M1: Yeah it illustrates that point that you need to give yourself leeway for things aren't going to go exactly as planned. So in terms of negative events, you know, that can add things that youjust wouldn't expect.

I: How did it make you feel having no control over what the event was going to be?

M1: Em, I think it added a bit, in terms of the game it just added a bit of excitement, yeah. It was just that it was good fun and..

F1: It was but at the same time you kind of need to be realistic and practical about your actions, like just now my last patient, the event kind of was the, the life or death moment, I know (laughs) so, em, I could have referred my patient but I chose not to because sensibly, like in real life, I would treat the patient but, like I couldn't because of the event.

I: Yeah. In real life you're not going to lose, you're just a bit late

M1: run over time, just a bit late, yeah

F1: Had a bad day, you know

I: Yeah annoy your nurses and all of it

M1: Yeah, yeah

I: Ok. Em you mentioned the collaborative nature of the game , what did you think about that, that em, it was what everybody was doing was affecting what you were doing and you couldn't just play to win?

M1: Yeah, no that was good, yeah. Em I like games like that anyway and so it was definitely a fun aspect. Its obviously, its good, obviously highlights teamwork and how you are going to be working as a team within a practice so I felt it was helpful.

F1: Its not like we are competing against each other so there wasn't like that competitive nature today.

I: How do you think that kind of reflects, em, your sort of dentistry journey and where you are in your sort of professional journey?

M1: yeah, well definitely throughout the years everyone's seemed to work as a team and stick together, help each other out so that's good and I hope that that continues into , eh, the professional career, realistically in practice that that's how it is, that people like to work together and help each other out. Em, the fact that different characters had different backstories and personalities I guess that would highlight that its important to know who you work with and what

their strengths and weaknesses are in a sense, you know, cause you know, it can help.
F1: And you have to look after them as well, like make sure they have enough time for everything and, um then you start to root for their strengths and help them out if they're , if they have any challenges or, yeah.
I: OK, so you both obviously like the sort of collaborative nature, em, can you think of anyone that you maybe know of, or that you've been aware of in your year or other years who is more competitive? Em, if you don't particularly think you are?
F1: (laughs)
M1: Mmmhmm, em, like specific examples? No I can't think of any particular student that's trying to spearhead their way, you know trample on the hands of others but, eh, I can certainly imagine go-getters and people that are very very ambitious and want to try and get ahead of everyone, em, I mean certainly when we work in a team I find myself comparing my performance and that to other people, not to the extent that I would want them to do worse, but just that I would like to do better. Yeah in a sense, yeah.
I: certainly while you were playing I could see that you were kind of watching what each other was doing and just making sure everyone was ok. How do you think it would have been different if you were playing with someone who was just making sure that all their bits were ok and no one else was?
M1: Yeah , em I think if the game was slightly more difficult and there was like, you could play to have one winner at the end if they could sort of steal the win that would be interesting, that could happen and, eh, to be honest in a game sense I could imagine myself wanting to steal the win, and whatever but, em, yeah so that would be interesting I could imagine that someone would end up working for themselves and helping themselves, but realistically when they need help I don't think they're going to get much back if they put themselves in that situation
I: (Laughing)
F1: Even if we were playing with someone like that they would know that the end result of the game is if someone else dies you die as well, so, they have no choice but to be collaborative.
I: They have to do it (laughs). Em so in the game, obviously there were some elements of time and some elements of stress and some elements of patient satisfaction. Obviously the time is very, sort of linear so what did you think about they way the time was in the game and , em, can you see how that would relate to sort of, life?
M1: Em, yeah, definitely obviously it was realistic in term of you're only going to get more pressure, you know, because it was linear and you're only, you're gonna reach, you don't want to reach the end of that. There's no really any realistic like, there wasn't a lot to save time and stuff it was just that a lot was adding on and so it just sort of shows you that you do need to try and keep on top of things. Em, I liked the different, like different procedures it kind of highlighted how that would take up more time and how different aspects would take up more of your time, you know so it was all sort of relevant in terms of that aspect.
F1: But one thing I'd like to say is that if a patient cancels like it doesn't mean that your next patient could come in earlier, I mean, you obviously have a , like an empty slot there and you have to squeeze in the next patient later on in the day so you don't actually have more time at the end of the day and get to leave early.
I: So you're thinking in real life?

F1: Yeah in real life
I: So the one at the end of the day cancels you get to leave early but the one in the middle of the day, you just don't have to rush so much with that root treatment (laughs) on the one before, yeah, ok. Em, what about how the sort of stress and patient satisfaction were represented in the game, what did you think about that?
M1: Em I enjoyed it. I liked that stress was obviously a factor in the game in itself you know you've got to take care of yourself and take care of how you're doing while all this is going on while you're treating patients. Em, it didn't seem as if they got to any extremities at any point in the game so I don't know if maybe just a change in numbers would add a bit more pressure on to these aspects. Em, and so you'd need to maybe consider them more in the game play? But it was definitely good as a visualisation of how things can go up and down and change as you go. And I think that because of the stress, eh, with each different character had different stress levels and different things that were going to stress them out that was interesting as you picked someone else, right well, I need to consider how I'm going to treat this patient or whats going to make me stressed out in this situation and so there was a lot to think about but it was interesting.
F1: It was interesting to see like every task you get it results in a different amount of stress and you can like plan that out really and I guess that's not really applicable to real life (laughs).
I: (laughs) Be nice if it was. Em, overall how did the game make you feel?
M1: So…
F1: I was just like in the moment I guess, I enjoyed it in the moment.
M1: Yeah it made me feel happy, I was enjoying it as I was playing, I wasn't thinking about much else, I was very focussed on the game, em, I was invested and it was good because while I was invested though its obviously so relevant for ourselves that it allowed, you could get a wee bit of subconscious reflection throughout that and a wee bit of thinking about things that you've, that have maybe come up and scenarios that you've done and..
I: So where was your mind going when you were thinking those kind of things?
M1: Mind going? Emmm, nowhere drastic but, eh, my mind was sort of going back to certain, maybe clinical situations. So for example in some patients where we had a child and what would come up and then I'm going "what would I do in that situation?" when it came to the task and so I would then picture myself in a situation where this came up and I'm going "right what would I actually do?" So sometimes you could play to win and maybe not get so much of your levels up, but realistically its good to play right what would you actually do and therefore how would that actually affect things that are going on? So.
F1: I actually imagine myself like in a clinical practice, all of us, and then well, eh, basically just playing like that, not really thinking about, um, what I would actually do, but thinking in terms of the game, uh. Like you said just now that we could, um, pick 2 task cards and, in my head that was like "why would you do that?" I mean in the game, obviously, because that would take up more resources and stuff. But obviously in real life you would want to do what's best for the patient.
I: Ok. So how do you think it has influenced you, if it has influenced you at all?
M1: So I think, certainly the biggest influence is, the main lesson that I got from it is that its going to be important to really think about yourself and how, what you find challenging, any situations that you find stressful and, if that is the

case, what you can then do? So how you can reflect on it and how you can work on these things to actually reduce your stress in real life. It shows you that you're not just stuck with that card, or that aspect of yourself, you can work on these things and it can benefit.
F1: I was thinking about that too but, um, I think the biggest takeaway is that, um, I need to keep in mind that in a dental practice you're actually working with other people and you need to take care of them as well and you're not just taking care of yourself, basically. I keep forgetting that we're a team, you know? And you know, you just tend to take care of yourself.
M1: Yeah
I: Em, so is there anything that you would change having played it? Or anything you would do differently having played the game?
M1: Personally I would just , find it, like enjoy a little bit if it was a wee bit more challenging, if there was a wee bit more of the cooperation involved. And I don't know if that would just be with the, the pressures of the limits, maybe we just got lucky and we had some easy games, but it seemed, but it would be useful I think to then have to start discussing more with players. Em, and just from an aesthetic point I think the resource slot, if you had 3 there that would be just useful. That's a minor things but.
I: And anything on a personal or professional level then that you would do differently in the future having played this game? Or anything personally or professionally that you would want to change having played this game?
M1: So, em…..Personally I think there was some, there were a few patients where I was particularly worried and think "Oh I should refer this patient" but then, upon reflecting, realising that it wasn't as concerning an issue as possible so maybe it would cause me to then not be so anxious, or trigger happy, to do that and actually reflect on what's going on in a realistic situation.
F1: Not over think about the situation so much?
M1: Mmhm yeah just take it in a logical fashion, and, you know, because also these things can be very emotive I imagine if theres difficult scenarios that came up and so, just by going through a series of questions or thinking about things properly, you actually make more of a correct decision, or an appropriate decision.
F1: And for myself if I think that something causes me stress, or makes me anxious, I can probably look for a solution to that. Like, I can do something about it, basically. Like obviously the children and teenager I can probably…. Really practice more, or, um, find a solution to that, to reduce the stress level.
M1: I think also just, em, what I might take as I go in to maybe VT or just practice, to really get to know my team mates and, you know, realising that people do have strengths and weaknesses and just sort of thinking about that as I work in , and how we all work together, em , could be useful in general for us, for myself, as a team, as a profession, it just would help everyone.
I: And what applications do you think this game has? How would you use it if it was yours? How do you think it could be used?
M1: If it was mine? I think it could be used, eh, definitely, definitely for student teaching for sure just to get people to start thinking about what practice life is like, what scenarios come up, that you have to think about different options, em, and that different things can happen in a day that you can't expect. So it starts to just give you a picture of how a normal, or how a day can go, how a working day can go. Em, so I think its useful for that. I think it would be useful for people in a practice, maybe as a team building exercise, em for sure. It would be useful for practices to, sort a, you know, and it would be fun as well so it wouldn't be so stressful, em, but it can definitely sort of highlight how we can

all work together, and I think that would be a lesson that's definitely prevalent in that.
F1: I think you can even, like, give it to your patients so that they would know how it feels like to be a dentist. Like in your practice, maybe you can put it in the waiting room for them to play (laughs).
I: (laughing) So they know how much they stress you out?
F1: (laughing) yeah
I: (laughing) Em, is there anything else that either of you would want to, em, say or add before we finish? Or is there anything, em, we've left out that you wanted to discuss?
M1: Eh..
F1: (quietly) Don't think so.
M1: No I think we're ok.
I: Thank you very much, you've been very helpful this morning, so thank you very very much indeed.

<u>Focus Group 2</u>
I: So the first thing I would like to ask you is really just to tell me your initial thoughts or impressions of the game, what did you think about it?
F2: I loved like the design set up and I thought it was a good way to do it. Em, I just like expected more difficult challenges within the cards. So we had like a few, so just like more so we can learn more how to deal with difficult like child protection, em, scenarios.
F3: I like the, that you have a selection of things that you can do, em, but I didn't realise until quite far in that you can do more than one thing to treat.
M2: I like the time and pressure, sort of, or stress scales you had. That was a really good way of measuring, in response to what you did how it would affect the rest of the team. But I would agree with other comments said that I didn't really feel that it did challenge me in any sort of child protection issues as much as they did come up and you thought that scenario kind of rings a bell with something to do with neglect or abuse. I didn't feel like anything happened in the game that would have, that had to deal with it kind of thing.
I: Ok. Any other general thoughts or impressions?
F4: I thought it was really, em, like you could see all the thought process behind it cause obviously the wee symbols had to match with the cards and they all kind of intersected almost. Em, like they said unless there's another thought process behind it, what would you do kind of thing, and its talked about after.
F5: It sort of reminded me in a way, when we started, sort of Monopoly type game, where you've got your own cards, but you're also watching what other people are doing and I like that it was a sort of team effort, sometimes you'd be watching if other peoples stress levels were going up, or if they were running out of time , how could you help them kind of thing, but then I guess in a game I don't know if you're meant to be against other people, or theres a sort of competitive edge to it but, yeah I thought it was quite interesting.
I: Em so if we move on then to discuss some of the bits of the game in particular, so what did you think about the different characters that were in this game? So we had Mrs Alpha, Mr Bravo, Miss Charlie, Dr Delta etc, what did you think about the different characters and, em, their sort of skills and

the things they found challenging or the bits of personality that were written about them?
F6: I thought they were quite relatable, the personalities.
I: Relatable to yourself or to other people that you know, or?
F6: Relatable to myself and other people I know (laughs). Both, yes.
M2: I'd agree, I feel like my character, I was Dr Delta, I kind of related to that a lot in terms of never quite knowing if things were going well but actually things were going well its more just you're internal stress and obviously, em, with that character you were getting extra stress points for certain things that kind of rung true with me if that was happening to myself I'd probably also start to fell stressed with what was going on. Em, so I felt that you can get more involved with your character if you can relate to some parts about it, and they were all stresses and characteristics of dentists I felt it was quite relatable to that.
F3: I think it would be quite good if, so some of the resource cards linked to the characters, if maybe you started off with one that did link to your character, just because, well I never had one that linked to mine at all, and its just kind of a get out of jail card, if you were running out of time or stress or whatever, be quite good.
F2: Yeah I'd agree, like maybe have the resource card like linked to the situation a bit more, rather than just like using it, em, freestyle.
M3: I think its good that each character has their strength and weaknesses so its kind of, whenever you do a task you know if its, like you can use one less time and from that you can help others, more, like your team mates.
I: Em, ok, and then if we move onto the different sorts of patient cards that came up, what did you think about the different sorts of patients that were pitching up in your waiting room?
F6: That they're good examples of the patients that we would expect to get so its, theres a lot of thought gone into it, you can obviously see theres a lot of thought gone into the game, you know all the different scenarios, the patients, you know they are kind of typical of what we would expect to, base, yeah it's a good, em, preparatory kind of tool.
M2: I liked the waiting room idea because it means like its almost like real life where you're going round and you're waiting to see what you're going to get next and you don't really know what's coming, obviously because they are all face down, but as you go round and see what everyone else is getting, you kind of think "whats my next one going to be?" and it kind of has that same sort of real life affect of you don't know what's going to come through the door next and you're having to sort of think on your feet as you do it.
F4: I did think though near the end, we were discussing it, em, that when you realised there was a time pressure and that and you had all the other things to think about, it did kind of not affect, it shouldn't affect what you do to, as in, that might be the next bit, but the way you would approach the case changes slightly to what we've been taught. I know it shouldn't, but these others factors that you're thinking about influence it definitely.
F5: Yeah so we were thinking if you should in practice, necessarily refer, but in terms of the game you don't wanna lose a stress point or something (laughing). So if you were playing it just as a game rather than as a clinician then you might not necessarily do the right thing (everyone laughs).
F3: Definitely some way of thinking, "mm I should do this but actually I don't want to because I'll lose so I'll do something that's maybe not great for the patient" (laughs).

I: That is a fair point and part of what the game is. So were there particular scenarios that you thought "oh this is what I'd actually do but in the game I'm not going to do it!", or vice versa?
F5: Don't think I…Ones with child protection I think you definitely, there's a set way you need to do it, but the other ones that were a bit more basic as in treat or review you could sway maybe, but the child protection ones I think should just be "that's it".
I: Ok, but in the game did you think you were making different decisions than you would make in real life then?
F7: I was thinking there is a lot of patients left and you are running out of time you would probably refer when you could, I mean, ask a colleague for help rather than treating it yourself, kind of thing, to not lose, to not lose the game.
I: And what sort of parallels do you think that has to practice, where you're going to be working and you will run out of time?
F4: I think it is important that you are always keeping your eye on the clock in terms of what you've got coming up and what you're trying to achieve that day, em, so being aware of how stressed you were or how your time was moving on was quite important as you were doing other things throughout the day which I thinks kind of similar to how you'll be in practice.
F3: asking for help as well if, say, a colleague in the practice has had a cancellation or something, being able to say, "I'm half an hour behind, would you be able to take on a patient?" Maybe depending on the patient, I suppose, em.
F5: I also don't know how it works in practice, that if your last patient does cancel- can you just leave? Or do you need to stay cause that would obviously, if in general you would, were asking for help, and they weren't there or they'd gone home. Would you just expect then to stay, or?
F6: I think it makes you more aware of working as a team so then if you, em, have a patient that's cancelled and you can see someone else is , you know, short on time, then you can say to them "I have patient's cancelled, I can help you out" so maybe make you more aware of that.
F4: Yeah I think it'd be good in terms of it being a game if you were doing more swapping with other people and looking at their board more to say, "right you've got loads of time, can you take this?" I know it doesn't happen as much in actual practice, em, but I think it would have been quite good because we were sort of doing that towards the end of the game but by that point nobody had time left, so (everyone laughs) We sort of couldn't (laughs). And up until that point I think we were just trying to treat everything and then all ran out of time (everyone laughs).
I: Em, ok. What did you think of the different scenarios that came up? The sort of patient things that they came in with? So the green cards, the sort of different scenarios…… That was the ones that was like pain, em, some of you got and others didn't, there was like endodontics, there was trauma, there was some neglect, there was some bruising and there was various things. What did you think of the scenarios?
F3: I think they were quite good because its random so…..it was good in a sense that you kind of just have to deal with what comes in which could happen in real life, you could have a patient for an endo booked in but actually somethings gone wrong in the week since you last saw them and booked them in and you need to sort that out first. So it could end up being like a difficult endo or, so it does seem to link in with what could happen in practice.
M3: I feel like the scenarios are quite diverse. Not many, I don't know if I wasn't very attentive, but I didn't feel like there were many scenarios to do with child

protection, like, I felt it was more a…. the common things that a general dental practitioner would see, not so much like, not very much focus on child protection, child neglect.
F4: Yeah I agree I don't think I got any, but maybe if we had played it for longer or something we would have come across it more.
M3: Maybe we just haven't gone through all the cards.
M2: On that same token I feel like, as much as there was a lot of things you normally see, having the few times where the child protection issue did crop up it was almost like that's what would happen in practice, it wouldn't be every patient that walked in the door would have bruising or whatever so its almost like it catches you on edge and you have to sort of think about it, cause in reality I don't think that will be your bread and butter of practice is going to be child neglect so it will be when you don't expect it, so its almost a little bit like its like real life, that's kind of how I thought it was like.
I: Any other comments on the scenarios?
F5: I think it was good that the game wasn't really competitive, I'm a particularly competitive person (everyone laughs) but, em, in the way that if someone had a scenario and they were deciding what to do people would chip in and say "well yeah I think you should refer or" cause it just makes you, discuss the topic and think about it as a team, rather than being like, well I'm going to cover my board and not let you know what I'm doing, sort of thing.
I: Yeah so that sort of collaborative nature of it?
F5: Uh-huh
I: What did everyone else think of that, of the collaborative stuff?
F4: If it was to be used in practice as a team exercise it would be really good, just cause you would have everyone, get everyone talking rather than just "I do this" that's it.
F5: cause you wouldn't really learn much from that being stuck in your way, but
F3: I quite like the idea that you'd be in the game as a team rather than fighting against each other to beat each other.
F6: Yeah I think the way its designed, it em, you know you need to work as a team because if you don't ,one person loses then we all lose, you know that's the way its designed so.
F2: Yeah at first I was like "how do I win?" (everyone laughs) but then realised no, it's a group thing.
(everyone laughing)
F4: I'm not treating anything, I'll just win! (laughing continuing)
I: Em, so some people would, perhaps, not enjoy that because it is collaborative em, its not competitive you can't win on your own, em, did you see any sort of parallels with maybe practice life with that?
F2: Yeah for sure, it just kind of like, it just kind of seemed like real life almost even though its just a game, I could imagine in my head, like we'd all be working together, and it would all affect all the team members and stuff so yeah it was good in that way.
I: Is there anyone you've come across in your careers so far who you think would be the person who would just want to, just look at their board and not anybody else's? (everyone laughing)
F6: Yes, I think some people are very competitive so, which is not a bad thing, but I think working in a dental practice you *have* to work together as a team. Which is emphasised by this board game (laughing).
I: Em and the yellow cards, the resource cards, so they were obviously quite different, some tagged to some characters, what did you, did you have any thoughts on the things that came up in the resource cards, em, anything that

surprised you or anything that didn't surprise you, anything that you found useful, anything, any other sort of comments on the resource cards?
M2: I liked then as they were like, not unexpected things, but having things like resilience or you've been well rested that is a resource that you have you just don't think about it as a resource, being well rested, being resilient will stand you in good stead for things that are going to come through your door that day so, that was surprising but I was like "oh that is a resource that would be good to have" on a day you were stressed or something like that so it was quite good. I liked the variation in the resources.
F3: If you could, the resources just seemed like, cause unless they were linked to you it didn't really matter which one you played, if they had like the shapes on like the patient card does and it has to link to the treatment, or whatever, when you play it then, and if you don't have it then you ask people for it, so it's a bit more collaborative. Because it just seemed like you were just playing it for, you weren't really reading it to see if it linked with what was happening, cause it didn't really matter.
I: Did anyone get any of the resource cards that tagged to their character? That helped with their character's challenges?
M2: I think I had one but I didn't play it, I had one linked to my character.
I: You had one that was helping you if you like?
M2: Yeah.
I: Can you remember anything about it?
M2: No I don't think, I didn't read it properly so but I knew it had like a diamond on it so I had that one.
F5: I think mine was that, em, if there was something difficult my stress level would go up a lot and then the card said that em, you were developing, you were sort of remembering that things stressed you out in the past but actually they ended up ok, so, that brought it back down if that makes sense?
I: Is that, is that something that you would find useful in the future that sort of knowing that theres ways to challenge the things that you find difficult?
F5: Uh-huh, I think its just sort of looking at the bigger picture and being like, well yeah I've done this before and its not had a terrible outcome so, sort of managing anxiety levels and procedures, em, yeah.
F6: I think, em, one of the resource cards I read was something like "you're not good at somethings and you did a course and you feel better about it" so I think that's a good resource and it just makes you think what you can do to go improve yourself and increase your resources but in terms of the game, I wasn't a big fan of the resources I'm afraid because I just felt like we were just playing it as another participant side and eh, not really using it because it wasn't matched to you, but in real life I think, they'd give you an idea of what your resources can be and how to increase your resources.
F7: And I liked how that sometimes when other players requires more than three resources they would need to get help from other players and sometimes the players that helped wouldn't be able to replenish the cards so you were left with two cards which is quite realistic in real life, em, that you might spend more energy and then, um less resources, so yeah.
I: Em, so the event cards, the black cards, what did you think about those?
F6: It was good when we had, like a whole family cancelled (everyone laughs) everyone's stress like, em, decreased you know and em, you were more likely to win as well because you have more time and everything else, so I think that's a, in terms of this game, you know you're wanting to have less patients and, em in real life I think its not really that good if patients cancel.

M2: I like just how it threw a spanner in the works, just when you think everythings going fine and then like the roadwork thing happened and everyone loses all the points immediately (everyone laughs) so I think it added a bit of excitement into the game in terms of like everyone's like right ok I have literally five minutes left to do another two patients or something, em, so I think it added a bit extra bit of, em, excitement into the game but also, is also very realistic when things are going well and, obviously by Sod's law somethings going to happen that's going to knock it off or make it better, so, em, I liked that element of the game. It kind of added a bit more to it.
F5: And I like that it, em, sort of incorporated every player again, so that if you were just sitting listening and someone else's turn you then had to affect your board and things like that as well.
I: Em, so time's obviously represented in a way, if you like, in this game, what did you think about this sort of way of managing time in the game? Compared to real life?
F2: It was a good way to visualise it, you can clearly see like you don't want to be in the red and then blacks obviously you don't want to be there because everyone loses (laughs).
M2: Also it also blocked the time out like it would be in practice in terms of, you know, if you have anything booked it would take you so many minutes so it almost blocks your day up into bits. So you could see like at one point you said to me "oh you've seen two patients already and you're halfway through your day so obviously you're kind of on track to finishing on time if you've seen two patients in half your time" so, em, it did help to chunk up a bit and make it more easy to see how far along you were and eh, how long things were taking cause you could see how far your counter moving as you went along.
I: Any other comments about the time?
I: Any the way the stress and the patient satisfaction were represented in the game, what did you think about that? So that's your sort of lightening flashes and your smiley faces.
F3: I quite liked that the different characters started on different ones because it depends on your personality and time management and your rapport with the patients, not everyone's just going to start on ten and ten or, so it was quite nice that things changed.
F4: I think its quite effective cause you're using the counters to, and your watching it going up and down so you're constantly having to look back at it and check when you're reading your cards and stuff like that.
F2: Also the characters, had like different skills and I liked how it matched with that so like, oh this one was good at , like fast treatment so it took them less time, yeah.
F6: I think its good I mean the stress and the happiness because that is something that you need to focus on and I think that when you are in practice then you're not necessarily going to be looking after, you should be looking after your own mental wellbeing, but I think when you are focussed on that patient and focussed on treating patients, and impressing your VT trainer or whatever, then, em, your focus isn't necessarily on your mental wellbeing and this game kind of refocuses that, you know, stress is important and you need to be able to deal with stress effectively, so.
I: Em, how did playing this game make you feel and why? Or did you go through a range of emotions and what was it that made you feel like that?
M2: First of all kind of confused, I had not idea what I was aiming for (everyone laughs) then kind of got more into it and then, em, I enjoyed it overall. I wouldn't say it made me feel really competitive or anything, I was more like

enjoying just kind of getting along with it and see how it went, but I wouldn't say. I'd say definitely a bit confused at the start but once you got the hang of it, it gets easier.
F6: I felt, you know, very similar I thought, I was a bit apprehensive because there seemed to be *a lot* of different things going on and, em, you know when you explained it initially I was like "ok I'm still not sure" and then em, you know, once I got the hang of it, you know, it was pretty straight forward but then, em, and I think that we worked really well as a group, you know with the time and everything, but, em, because you said the other team lost and we won I was like "oh yes!" (everyone laughing). So I think that brings out the competitive side because you know you're still kind of competing against another team, but you know you're working as a team to compete, so, em. I really enjoyed it, I think it depends who you're with as well I suppose, but I feel like the people we were playing the game with were all, em, helping each other and it was a good game.
F3: I like the idea of rounds, so if you beat the four then you'll go up and the next day you'll have five and see how you can manage that. I think there's probably a limit to how many you can have (everybody laughs) but, em, yeah quite liked that part. That made me feel a bit competitive, em, not against other people but against the game kind of thing (everyone laughing).
F2: Yeah I liked how we liked working as a team, it felt like a real practice situation, em, but after a while I was just like right I want to be challenged more, I think that was just my thing.
M3: I think the aspect of teamwork come in later in the game, cause at the start everybody is just treating because we have a lot of time left and then near the end we start to ask people for help and spread our load.
I: Em, how would you say the game has influenced you, if it has at all? And why or what will you take away having played this game?
M2: Probably that the, that your actions are actions, things that affect you within the clinical environment will also affect other people who are working with you, for example a lot of these cards, a lot of these events that happened throughout the game, they affect people's stress levels or how much time they had, or their patient satisfaction so I think more than the child protection issues it probably highlighted more just the idea that as much as you're working independently your actions and things that happen to you will affect the working day of everyone else there.
F3: I liked the stress levels, stress management things that you might think are normally quite trivial could affect you and you'd not even realise it but its slowly building up, you know having loads of traffic or, eh, power cut and evrythings slowly building up and you might be getting more and more stressed and not really realising it but it might be affecting how you're treating the patients and time management and things like that.
F4: Yeah I agree with that and its sort of like each of these characters started with different stress level but each of your days could start on a different stress level and its like all these sort of micro stresses could be something that really affects your practice and you might not be aware of, em so its quite an interesting perspective on it.
I: Is there anything that you would change in the game, you've mentioned that you didn't like resources and you might tag them to different things, so anything else you change in the game?
M2: Maybe a different pathway for the child protection issues in terms of when you've got that card, something else happens in the game which you then have to go down what you do about that in terms of do you go with a local approach,

do you speak to their parents, do you talk to your team members, do you talk to the local health board, like go through the whole process that was in the local policy for the practice or the health board just to maybe explore that option and then.. I don't know how, what would happen but just sort of another avenue just to explore that as a separate issue.

I: Ok. Anything else anyone would change?

F5: I'd quite like if you had to swap cards more with other players, because I think we did start doing that towards the end but I don't know if it was just our game, we didn't really do that at all at the start so it would be quite good if, you know, you only had one resource and you didn't have the one you wanted you have to ask someone else for their resource or something.

F3: Maybe having, eh, for different scenarios, maybe a preferred or like optimum approach of your treatments so that you don't tell them but if, say, you were running out of time and you were thinking oh I'll just refer because I've not got enough time, that you would get the points on the card but if you did the proper pathway that is kind of like the proper approach then you get maybe bonus points so its more incentive to, rather than I've not enough time I'll just do the thing that's going to cost me less, actually I'll get less stress points if I did the right thing. I don't know, something.

I: Anything else anyone would change?..... And is there anything or what would you change in your personal or professional approach or life, em, having played this game? Or what would you do differently in you personal or professional lives having played this game that you might not have thought of doing before?

F6: I think being more aware of my stress levels, em, cause I think the game really focusses on that and, em, just generally look out for other people because if their stress levels are like through the roof then we all lose, not just in the game but in life! (Laughs).

F4: I think as well being aware of what's happening in other surgeries when you're working in a practice not just what you've got in that day but looking at the bigger picture and how many patients someone else has or how they're coping as well rather than just, you know, within your surgery.

F2: And I liked the thing about like reflecting on being aware of what you're good at and stuff so if you're not good at something like go to a course and try and do something about it, yeah think about constantly.

I: Ok, Anything else?.... So what applications do you think this game has? When should we make you play it?

F3: Teamwork. Maybe a bit lower down in , when you're a student just to get, like the ball rolling on the fact that you do have to work together in a practice and its not just an individual game like it might seem in op tech where you're not really bothered about what, like any one else is doing.

M2: Maybe in VT as well I suppose you could have it, or even beyond that in practices like if they're having staff training days or whatever like that could be quite fun, or even in departments in hospital just to have a more informal, maybe a bit of a competitive style of training thats not as, maybe just normal sit down listening to something or reading a document, it's a bit more of an interactive way of delivering a training session.

F3: Tailoring it to specific ones as well so you could do one that's specific to, like, endo if you're needing a bit more of a boost or something that's specific to paeds, it's be quite good.

F6: I think it'd be *really* good in practice because I think that people are, you know, so focussed on their own surgery, their own book that they don't actually see what their colleagues are doing and if they need help and I think this would

really help just in general practice so you're aware of what other people in your practice are doing, you know, and you can help, you can manage your stress, you know if you're aware of what other people are doing. Basically just work in a team, that's really important, yeah.

I: Any other applications that you guys can think of?

M2: probably during sort of third, fourth year time when you're doing child protection training for paeds in lecture form there could be tutorials where this is one of the lesson plans is doing this game, em, in a sort of tutorial session.

I: Some of your other colleagues have suggested it for revision? What do you think about that?

F3: OSCE revision maybe, it'd be quite good for, just for if there was a case where you had an actor and it was, what are you going to do? Then it's kind of refreshing everything that you could do for different scenarios.

M2: Maybe if the treatment options, or the task cards you get, em, if they said the options were to treat, refer, whatever, em for revision you had to go through those treatment options and those referral pathways as part of getting points, so as part of decreasing stress or whatever, the points system would be, I think that would be more applicable to revision cause just saying you're going to treat something doesn't make you think about what the treatment would be, but if you had to actually, sort of, go through that in terms of what would be the options then that's probably more a revision process then just saying treat or refer.

I: Ok. Is there anything else anyone wants to add or say before we finish? Or anything that we've left out that you wanted to discuss?

I: Thank you so much for your help, its been great. I really, really appreciate it, em, cause I just couldn't do it without you, em, without people who volunteer to evaluate it before it goes out to everybody so thank you very, very much.

<u>Focus Group 3</u>

I: So, the opening topic was really I'd like to know what your initial thoughts or impressions of the game were having never played it before and just seeing it today?

M4: I like the fact it was a game, but we all had to sort of work together to complete it rather than being at loggerheads with one another, especially as us working as a dental team, thought that was quite good.

F8: Yeah, you had to like pay attention to what everyone else was doing so you could all win together rather than competing, I liked that.

F9: I like how it was quite relatable so, in like the sense, certain cards you would draw you actually had to think about what would you actually do in practice rather than doing it for the sake of the game, which I thought was actually quite good.

I: Em, and there were different characters on the game, so a couple of you played a couple of different ones, em, and obviously say what the other characters were, what did you think about the different characters and their personality aspects?

F8: I thought they were quite relatable, can't remember which one I had, but I was reading it and I was like this is me!! (everyone laughs)

F9: I initially thought that as well when I picked up the card and you asked if I was happy with the character I was, like, yeah this is actually how I am in

situations so, em, and I did have a read at a couple of the other ones and they were relatable to what I imagine a lot of dentists would be.
I: Em what about the patients that came up as you were playing the game, what did you think about that?
M4: You could sort of tell how each sort of patient, especially like my second character you could see how treating different patients affected how the game sort of went on. Like I was always sort of circling the patient satisfaction drain (laughs). No, it was really interesting to see and how it all matched up and sort of how it all ran. I enjoyed it.
F9: I like how it was like situations that would actually come in, it wasn't like really bizarre things that you'd probably never see so, like, some of the scenarios like come in in pain and stuff it was stuff that you would be treating, you'd have to like make decisions on, so.
F8: I actually wasn't expecting it to be a board game, I actually thought it was going to be like an online game but I liked how it was a board game because it felt like we were playing it together rather than just on the computer, playing it online.
I: Em, and the different sort of scenarios that came up, you thought they seemed quite sensible like the sort of things that would come up?
F9: Yep
I: Any other comments about the different sort of scenarios, so the green cards? Anything you would have changed or any comments you want to make about the different scenarios?
M4: They all seemed quite appropriate, they didn't feel sort of too abstract or something that you'd not really see, it was always something well within your remit, although like particular circumstances you'd probably be put in, so I thought that was quite appropriate.
I: Em and the yellow cards, the resource cards did you take a chance to read any of them when you were playing them? What did you think about the resource cards and the sorts of things that were there?
F9: I read them, a few of mine were similar on the first game, em, I just found it confusing like what ones to play, em, whether you could play, like sometimes it said, requested two, em like what ones you would chose but I'd imagine that would just be something that you would learn as you played the game, but yeah.
I: Ok. Any other questions, eh comments on any of the resources? Did anyone have any that helped their character? Not in this one?
M4: Don't think so, no.
I: Em so some of them were tagged to different characters so they would reduce your stress, or what have you, and they sort of gave you suggestions of whatever your personality trait was that you found difficult, em, there were resources in there that were tagged to give you suggestions as to how you might get over that. Em, the events that came up, what did you think about them?
F9: That was the black cards, yeah?
I: It was the black cards, yeah.
F9: Yeah I thought that was stuff as well that was quite relatable, like some of the situations that could happen in a practice and you do have to deal with them not just as you as an individual but as a practice and it was good that you had to then do that, let everyone know what had happened and how you would adjust the game based on the event card. Quite liked that.
I: What in that you would make different decisions based on it, or?
F9: yeah so, like, for example like the power cut one, it doesn't just you back, like it sets everyone back and you have to kind of relay that to the rest of the

team or like the roadworks or the patients cancelling, how it doesn't just affect your character it affects everyone elses, which is also true, I'd imagine, in what a practice would be like, It wouldn't just affect you. Quite liked that.
I: Any other comments on the events?
M4: I liked how it all continually reinforce what the patient would respond it it, so like their levels of satisfaction and what, things that are completely unavoidable but still have an impact on how they see you and the practice.
I: Em, what did you like about that?
M2: Its sort of reinforcing that even though there's things that we have to, sort of, manage its always going to influence the running of the practice, not just for the individual, for the whole entirety of it.
I: Ok, yep. Any other comments?..... And you mentioned the sort of collaborative nature of the game, what, em, did you think about that and compared to real life? Or what you imagine real life practice is like, or even being on clinics just now?
M4: So continually having to think about your own management of things and how everyone else is sort of managing it as well cause, especially if like you wanted to pass a patient onto another person but if they've got, if they're already maxing out for time and, or maxing out stress or patient satisfaction you can see how that would affect not just them but the patient and.. everythings linked! (everyone laughs).
I: Any other comments on the collaborative bit?
F9: Em pretty much what he said.
F8: On like a game level I liked how other people's actions affected you as well cause like you were always paying attention like when you're playing like a board game like Monopoly or something, when its someone else's turn you're not really paying attention, not really affect you that much, but as everyone was reading out their things I was like listening and also learning as they were, like how they would deal with it and things like that.
I: Em, does anyone play collaborative games? In general? Do you prefer a competitive game where you can win over other people? (everyone laughs)
F9: I've never actually, I'd never played one so, not playing a game that someone didn't win was different but it was actually good because you are constantly aware of like actions, I have to play in a way that's going to benefit everyone else, rather than just myself which is different, obviously, to a competitive game but I quite liked it.
M4: Its like can we survive rather than can we win, yeah, can I win, sorry.
I: Now it might be yourself or it might be other people you know; can you imagine how it might have been different if you had had someone who's very focussed on themselves?
M2: Yeah definitely.
I: what do you think the difference might have been?
M2: So if you don't play collaboratively then you won't succeed (laughs).
I: Em and in the game obviously time was just measured in the units what did you think about that? Doing it that way?
F9: Yeah I liked it
F8: Yeah I liked it.
I: Yeah?
M4: Sort of things stacked up and if you were just referring or treating or just doing both or reviewing you can see how that sort of takes up your day and, especially if you have stresses and you have to think about patient satisfaction on top of it you can sort of be able to make appropriate decisions in that

moment rather than, just doing something because you think its probably not the most appropriate thing to do but you can survive by it, if that makes sense?
I: So you felt there was a bit of, of pressure or something? In your decision making or?
M4: Little bit of pressure, yeah and sort of looking at where everyone else is at also.
I: Mmhm, em, and you mentioned that you were looking at the stress and patient satisfaction as well
M4: Mmhm.
I: Was that the same for you guys? Or what did you think about how those were sort of represented in the game?
F9: Em I liked it as well, em, cause I was like aware of when people were lower on the patient satisfaction, so then if I had to pick an events card that was lower I was like "oh no, is this going to, this is gonna affect them, like this is gonna put it borderline" so.
I: So if you were circling
M4: Circling the drain!
F9: (laughing) I was very aware of that, so I was like, Oh no! Yeah I liked, liked the patient, so its two kind opposites so although you're trying to keep the patient satisfaction up you're also wanting to keep your stress down, em so its that balance with a lot of the cards.
M4: And you see how different personalities in the game affect to different stresses and different patient satisfaction and like different treatments and things, you can see how that also affected things.
I: Anything else?
I: Em so how did it make you feel playing that game? How did you feel when you were playing it?
F9: Like you actually, em, when you were asked a question related on …. I think it was the bruising, actually made you think like what would you actually do in that situation. Em, cause right now its not something that we have to think about majorly but it is going to be something you're gonna have to deal with, so, to think about that now is actually, like it gets you thinking now like if that to present, what would you do? So I quite liked having to think about that.
M4: Especially with mine where I had two different patients but I got the same card for them in different games, so a six year old compared to a ten year old, losing a tooth you can see how differently you would manage that as a six year old is probably a bit more expected to lose a front tooth but if it's a ten year old you would have to manage that differently and that's something that I probably have to think about a bit more, but, you can see how different things link together.
F8: I liked how, is it the treatment card, the red cards? They were always the same so you knew that you always had the same kind of options to chose like how you were going to manage it.
I: Em and did you think that those sort of, the options for treatments were ok, reasonable or would you have changed them?
F8: No they were realistic.
F9: Yeah
I: Em so you mentioned that you think its influenced you a little bit in that you're thinking "oh actually in a years' time that might walk in and I might have to deal with it or in the OSCE or wherever else", em, is there any other ways that you feel it might have influenced you, this game? That made you think about something that you've not thought about?

F9: Probably just working with others in the practice that the decisions you make will influence everyone else, em, on a real life basis that you do have to think about not just you and your patients but other people who are in the practice and might need help or it might affect them. Your decision might affect them so, yeah.
I: Any other ways its influenced you?
M4: Just in like terms of different follow ups and kind of things?
I: Yeah, or anything about the, you know, the characters and their personalities and how they were coping with it, anything?
M4: Sort of seeing how other people react to different things and how that affects their life within the practice and how they sort of manage patients as well, see its all quite different and it takes different people different times to do things and it can affect their stress in different ways or patient management in different ways, so probably being a bit more aware of how to work with other people.
I: Ok. Anything else?
F8: Just like if you were ever unsure in a situation of like child neglect and things like you always have the others in your practice to kind of, you know ask advice or, em, to help you yeah.
I: What would you say you would take away from having played that game?
M4: Think more about your colleagues.
F8: Yeah.
M4: If you're not sure try to ask other people or just discuss with them. I mean it will take a short amount of time but be able to see where probably to go from there.
I: Em and anything that you would change either personally or professionally in your future professional life having played this game? Any differences?
F9: Em yeah probably just like although like your character might deal with something one way like your character could have dealt with it a different way and you need to, obviously, realise that but if you aren't sure how to deal with something as well you can talk to someone else in your practice to get their opinion on how they would deal with the situation, cause I think one of the cards was, one of my resource cards was, em, you realise that worrying in certain situations isn't helping anything and that's actually something I do so it was quite, you can like talk to someone else and think "is there a reason to worry in this situation?" So, just that probably.
I: Yeah so ways to get over the things you find difficult, yeah.
F9: Yeah.
F8: Yeah like its ok to ask for help, like everyone has different skills, things that they're good at, so if you don't know how to deal with a situation then maybe someone else in your practice can help you.
I: Anything else?..... Ok so what applications do you think this game has? So if we're gonna use it for teaching, what sort of applications do you think it has? When would you want to play it, em, when do you think it would be useful for students to play it?
M4: Definitely 3rd year, 4th years a probably a really good time, yeah. Not just even the terms of learning more about child protection but learning more about how to work with other people and appropriate treatment options and making sure that that's all quite appropriate. And just getting a bit more skill and variety of different things and brining it all together.
I: Any others?
F9: I don't know if you could but maybe , like, play it once quite early on when you've been in clinics and not done that much and then playing it again, maybe,

a few years later just to see how, like the differences you'd make cause there's decisions that I, like if I'd to play it when I was just starting out in clinics there's stuff I probably wouldn't think about and I'd be like just "treat, treat, treat" but you actually sometimes have to refer, have to ask for help so it'd be good to see maybe how your decisions would change, the more that you've been exposed to patients in clinics in real life. Em, don't know if that would be helpful?
I: Some of your colleagues have also suggested it as revision before the OSCEs?
F9: Mmhm
I: What do you think about that?
F8: Yeah it gets you thinking of how you would deal with that situation, em.
I: Any other applications you think it has? Or beyond, beyond dental school if you can think that far yet? (everyone laughs)
M4: I think you could do it as like a peer review, like a peer assisted learning group so like older years with younger years and sort of maybe like fifth years and third years something like that. So people who have been treating patients but seeing how different people would, or different years would react together in that situation.
I: And how about once you are out in practice? Can you see any applications for it out in practice?
M4: If you're in quite a big practice it'd be good to sort of play it with other people, especially as the different personalities you'd be able to gauge how different people would react to the situations. So that if something like child protection does come up you can see how they would, sort of, respond and manage it and how that may differ from how you would react to it or respond to it.
I: So you mean as sort of like if you played it in practice and then used it as a discussion point as to ok that was the game but what are we actually… is that what you mean?
M4: Yeah what do we think about it, yeah.
I: Ok, anything else?
M4: Do it at conferences and have a battle to see win first, last as many games (laughing)
I: Yeah, yeah (laughs). Anything else you want to say before we finish, anything that you think we've left out that you want to discuss? Anything that you would have done differently or changed? Anything like that? If it'd been you doing it?
M4: No just the resource cards, maybe being able to make them a bit more applicable to the situations. Sometimes I felt like I was putting them down when they could have just been anything, so just making them tie in probably a bit more, but
I: To make it more tricky for you? (laughs)
M4: Yeah (laughs)
I: Like make it more difficult!
M4: Make it more difficult!! (laughs)
I: Em, that is really all I wanted to know. Do you have any other comments that you want to make, or you think would be important, em, that I've not thought about? That I've left out?
M4: No that I can think of no.
F8: I don't think so.
I: Em thank you so much for your time today, it has been really helpful obviously I can't do this without people playing it and giving me a bit of feedback so thanks very much.

Appendix 20 Evaluation Analysis Initial List of Potential Topics

Topics of interest recurrent across data set and relevant to evaluation question:

Unintended consequences

Side effects

Notices similarities to self

Similarities to real life

Relevance to clinical situations

Ways of coping/resources

Enjoyment/fun

Initial confusion/ apprehension

Team work

Team work in professional life

Attention to others actions

Insight into how others act

Compete against the game

Compete against other teams

Desire for more challenge

Desire for different pathway options

Expected more challenging situations

Balancing stress, patient satisfaction, time

Personal challenges can be solved

Things that are out of your control

Differences in choices in the game compared to real life

Differences in game compared to “real” working/professional life

Not as much child protection as expected

In the moment/ absorbed in the game

Self reflection on previous experiences

Looking after yourself and others in professional practice

Bigger picture in practice

Other external influencing factors

Other applications for the game

Potential improvements

Influence of time, stress, patient satisfaction on decision making

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