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A qualitative study of health professionals' views on using iPads to facilitate distraction during paediatric burn dressing changes

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Abstract

Introduction: Distraction is a non-pharmacologic pain management technique commonly used to avert a person's attention from procedural pain and distress during stressful procedures such as treatment after a burn injury. In recent years, computer tablets (such as iPads) have been used within paediatric burns services to facilitate distraction by way of apps, games, cartoons and videos during dressing changes. However, we know very little about health professionals' experiences of using them in this context.

Methods: The current study explored health professionals' experiences of using iPads to facilitate distraction during paediatric burn dressing changes. Fifteen health professionals from a single paediatric burns unit were interviewed. Thematic analysis revealed two key themes: (1) the iPad is a universal panacea for distraction; and (2) trials and tribulations.

Discussion: Participants considered iPads to be potentially useful and effective distraction tools, suitable for use with a wide range of patients with burn injuries including young children, adolescents and young adults. However, issues including health professionals' understandings of one another's roles, the challenge of working in a busy burns service, and lack of experience and confidence were identified as possible barriers to their use within routine burn care. Training for staff on the use of iPads as a means of facilitating distraction, development of guidelines and a review of how they are incorporated into routine burn care are recommended.

Keywords

Burn, computer tablet, distraction, dressing change, iPad, qualitative, stressful procedures

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Lay Summary

Background:

Treatment for burn injuries, particularly dressing changes, can be extremely distressing for both the patient and family members who are in the room. Distraction is a technique commonly used to avert a person's attention from pain and distress during stressful procedures. In recent years, computer tablets (such as iPads) have been used within paediatric burns services to encourage distraction through the use of 'apps', games, cartoons and videos during dressing changes.

The issue being explored:

This is the first study to explore health professionals' experiences of using iPads to distract burns patients during dressing changes.

Details of how the work was conducted:

In this study, 15 health professionals were interviewed about their experiences of using iPads in this context.

What we have learnt from this study:

While health professionals were very positive about the use of iPads and distraction with children and young people, it was evident that attitudes towards their use, the pressures of delivering burn care within busy ward settings, and a lack of training and confidence meant that they were not always used. This study identifies a need to support health professionals in this situation and to consider the development of guidelines and training in the use of iPads within paediatric burn care.

Introduction

Dressing changes are a particularly painful aspect of burn care,[1] and are often stressful for patients and their families.[1,2] Pain and stress during a dressing change can induce an increase of anxiety and discomfort during subsequent dressing changes, leading to fear and avoidance of future care.[3] Diverting an individual's attention away from pain and discomfort during such invasive procedures is therefore essential to alleviate their distress and ease future treatments.[4] Distraction is a non-pharmacologic pain management technique commonly used by both health professionals and parents to avert a child's attention from the pain and distress associated with invasive medical procedures.[5,6] It is a cognitive behavioural strategy which shifts the child's focus away from painful stimuli[7] and works on the belief that by diverting a child's attention to something which engages and stimulates their interest, his or her ability to focus on pain is compromised,[8] thereby reducing pain, anxiety and distress surrounding the procedure.[5]

Koller and Goldman[5] classified distraction techniques that divert the child's attention as either active or passive:

- *Active distraction* promotes a child's involvement through engaging them in an activity during the procedure. For example:
  - Interactive toys such as multi-sensory electronic and video games stimulate audio-visual, kinaesthetic and tactile senses thereby requiring the child to employ cognitive, motor and visual skills. In order to be played successfully, the toys require an adequate amount of attention, which encourages the child to become engrossed with the game and less aware of his or her surroundings.[9–11]
  - Controlled breathing is a cognitive behavioural technique in which the child purposefully paces their breathing.[5] This seeks to counteract hyperventilation, which is a benign symptom of panic, by providing distraction and helping to

prevent a panic response.[12] It is an active form of distraction that incorporates elements of relaxation[13] and can be achieved through using bubble blowing, party blowers and breathing exercises.
- Guided imagery is another cognitive behavioural technique used to help children achieve a state of relaxation that can influence their perception of pain.[14] The patient is directed in muscle relaxation and then audibly guided through a scene or story. It has been shown to be effective in reducing pain and anxiety within paediatric populations[15–17] and decreasing parental anxiety and distress during painful procedures.[18]

- *Passive distraction* involves the child observing a stimulus rather than directly participating in an activity. It includes auditory distraction (for example, by listening to music) and audio-visual distraction (for example, watching television).

Non-pharmacological support and interventions for pain management in burn patients are recommended in national guidelines in the UK, Denmark, New Zealand and the USA,[19] and a variety of distraction tools and toys are now employed within burn care units, to help deliver different distraction techniques. For example, a recent systematic review of music as a form of distraction (passive distraction) for adults and children during burns treatment found positive effects on pain, anxiety and heart rate.[20] Some services now use computer technology to facilitate active distraction, including fully submerged virtual reality games where the patient wears a head-mounted display (helmet) and interacts with the game via a joystick, computer keyboard or mouse,[21,22] and specially developed hand-held multi-modal distraction devices.[23] However, these can be costly and cumbersome, they offer limited or no choice of the type of distraction available, and the level of cognitive capacity required to understand both a set of demands and an input device (such as a keyboard, mouse or controller) may mean they are not suitable for every age or patient group, or procedure.

In contrast, the user interface of Apple's iPad is constructed around the device's multi-touch screen technology. They are cheaper, less cumbersome and offer access to an array of sources for both active and passive distraction techniques through the ability to view videos, listen to audio, take photographs, and play games by downloading and installing applications ('apps'). In March 2017, over 2.2 million apps were potentially available to iPad users and more than 2.8 million were available through Android systems (www.statistica.com). Careful selection and downloading of apps allows the device to be modelled accordingly to meet each child's individual interests and cognitive ability.[24]

iPads and other computer tablets are now widely accessible in educational settings and used by children of all ages.[25] Children from the age of four years can interact fully with age-appropriate apps, and those aged 2–3 years can interact with them but are not necessarily able to complete complicated or intricate touch control.[26] These more recent findings are in contrast to Duff and Bliss's guidelines[27] that children aged younger than five years are unable to successfully engage with hand held computers.

It is therefore no surprise that iPads and other computer tablets are being used to provide distraction during stressful medical procedures. McQueen et al.[28] have described how computer tablets and a variety of apps were used with children receiving treatment for a range of injuries, and they have been shown to reduce parents' perceptions of their child's pain and distress during immunisations in busy clinics.[29] Burns services have started to employ iPads with waterproof cases that allow them to be used while dressing changes are taking place in a hydrotherapy bath. Yet, to date, there is no published protocol for using the iPad as a distraction technique within hospital services; current relevant guidelines and standards in the UK (e.g. The British Psychological Society,[30] The British Burn Association[31]) do not mention touch-screen interfaces such as the iPad.

Given anecdotal evidence of the increased use of iPads during stressful burn-related procedures, we set out to investigate healthcare professionals' perception of their use as a distraction tool, including how they are being used, the extent to which they deem them helpful and effective, and their experience of using them with different patient groups (for example, particular age groups). Understanding healthcare professionals' views and experiences of using iPads during burns dressing changes will provide a detailed insight into how they are employed, and whether there are any barriers or facilitators to their use as a means of improving the experience of dressing changes for young people.

The current study therefore aimed to examine how iPads are being used to facilitate distraction

within a paediatric burn service, with a view to informing guidelines for their future use in burns and elsewhere. We chose to use the term 'iPad' since this was the make of tablet used in the service involved in this study.

Methods

A qualitative methodology was employed as this is ideal in exploratory work, when there is not a pre-existing body of research evidence and when the focus is explicitly on participants' situations and experiences.[32] In this instance, a qualitative approach allowed for an in-depth understanding of health professionals' experiences of using iPads as a distraction tool during paediatric burn dressing changes.

Interview schedule

A semi-structured interview schedule was developed by the first author after a review of existing research literature around distraction during stressful procedures. It included, but was not limited to, experiences surrounding the process of burn dressing changes, the role of parents, integration and use of different types of distraction offered by the iPad, and experiences of adapting techniques to each child's age and injuries. Participants were also asked about their role within the service and whether their training incorporated the use of distraction techniques generally, and iPads in particular. The interview schedule was peer-reviewed by both co-authors before a pilot interview involving a healthcare professional at the trust.

Recruitment

Snowball and purposeful sampling were employed to recruit participants across major disciplines involved in paediatric burn care (surgery, anaesthetics, nursing, play therapy, psychological services and physiotherapy). The clinical psychologist (JC) provided study information sheets to all members of the burn care team within a specialist paediatric unit treating 750–1000 children with burn injuries each year. Those who were interested in taking part contacted the researcher (EG); any queries surrounding the project were discussed and a mutually convenient interview was arranged. A total of 15 health professionals were interviewed including surgeons, nurses, play specialists, physiotherapists and clinical psychologists. Two participants were male, and most (n = 14) described themselves as White British. They had been working in burns for between 4 months and 18 years (mean = 7.1 years).

Procedure

The interviews took place in private, in a quiet side room on the burns ward. Telephone interviews were arranged with those health professionals who wished to participate but were unable to commit the time for an interview while at the hospital. The majority of interviews (n = 13) were conducted face-to-face, with only two being conducted over the telephone. They were all digitally audio recorded and transcribed verbatim, and they lasted a mean of 32 min (range = 25–70 min). Written consent was given before the interviews took place. The interviewer (EG) had previous experience of assisting with invasive procedures from her time working as a healthcare assistant across stroke rehabilitation, general nursing, psychogeriatric and palliative care. In each of these settings, she had experience of preparing routine invasive procedures and providing additional psychological support. Throughout this study it was, therefore, important to ensure that the researcher did not project her own experiences of distraction techniques, so a reflective journal was kept to help document her emotional responses from the interviews which could influence the analysis and interpretation of data.

Data analysis

Analysis was guided by the emergent interview themes rather than by a particular theoretical framework in order to avoid imposing constraints on the analysis. Thematic analysis (TA) was chosen as the method of qualitative analysis, and an inductive, semantic and realist approach to TA was carried out (in accordance with Braun and Clarke[33]). Inductive TA is explorative and does not draw upon any preconceived concepts that other research may demonstrate. The primary researcher (EG) familiarised herself with the data through the transcription of the interview recordings, reading through the data and noting ideas. After this preliminary work, initial codes were generated so that the coding within this project was 'data-driven', where the themes emerge bottom-up from the data set. The codes were then categorised into potential themes. A review of the proposed themes was conducted in which the researcher checked if they worked in relation to the coded extracts and the entire dataset, and then generated a thematic map of

the analysis. Data analysis took place alongside data collection, to ensure saturation of the data and that all themes were explored across the dataset and within each health professional group, i.e. surgeons, play therapy team, etc.

Subjective interpretation of data is inevitably unavoidable with all forms of qualitative data, so a section of the dataset that had been coded by the primary researcher was also analysed by a second coder. This analysis was conducted separately and no discrepancies were observed between the two different researchers' codes. The final themes were discussed and agreed among the research team. The interviewees were offered the opportunity to review their own interview transcript, but none chose to do so. They were sent a summary of the findings from the analysis and invited to give feedback and comments. Two participants replied with positive feedback.

Ethical considerations

Ethical approval was gained from the first author's institution and all necessary R&D approvals were obtained. Since burns research, treatment and support is a small community, detailed descriptions of the participants' backgrounds may mean that others in their field of work are able to identify them by the comments they have made and the description of the work they do, creating a conflict between presenting these details and the requirement to protect their confidentiality and anonymity. Therefore, an alternative approach was needed when reporting participants' responses compared with usual protocol; for this reason, participant numbers are used as an identifier, instead of indicating gender and profession.

Results

All the participants had experience of being involved in changing children's burns dressings where iPads had been used to distract the child from the procedure. Interviewees spoke in detail about their experience of distraction techniques in burn care generally, and specifically their experience of using iPads. Two key themes emerged from the thematic analysis: (1) the iPad is a universal panacea for distraction; and (2) trials and tribulations.

The iPad is a universal panacea for distraction

Most of the participants (14 out of 15) discussed how the iPad had changed their perception and practice of distraction techniques:

'*The use of the iPad and the introduction of the iPad has revolutionized the level of play therapy that we can provide to children, and distraction in procedures, and also the hospital environment.*' (Participant 12)

They described the use of a variety of apps enabling different types of distraction. For example, Participant 9 described a cupcake decorating app that enabled active distraction: '*…the child gets to select the colour, frosting style and decoration of the cupcake…*' and Participant 12 referred to an interactive adventure game app: '*…the child plays a character which is continually running. The game requires the child to pay complete attention to the barriers and rewards and react quickly in order to complete the level.*'

Three participants reported using apps to encourage controlled breathing including blowing bubbles through the iPad's microphone: '*I have used the iPad to help calm a child down and get them to concentrate on their breathing. I find the bubble blowing app works really well at engaging them and getting them to take deep breaths.*' (Participant 5)

Three participants described using it for guided imagery, with audio guides talking the child through a scene. The iPad was also used to provide music to prompt imagery (such as seaside noises) while the therapist told a story. iPads were also used to facilitate passive distraction, for example through music and videos; '*If we know they are Peppa Pig mad, we will either try and get the child to play with an app, or watch a video or listen to music related to Peppa Pig.*' (Participant 9)

Participants described how the iPad allowed for a longer period of distraction in contrast to other methods of providing distraction (such as blowing bubbles and pop-up books), enabling the health professionals more time to access the wound site and thereby facilitating their evaluation and dressing of the wound:

'*As a result of that (the iPad) you get better co-operation from the children, you get extra time to just look at the burn and make an analysis of how it looks, you can dress it better.*' (Participant 12)

The iPad was also considered useful because it could physically block the patient's view of their wound, which reduced distress since they could not see their injury and the medical procedure that was taking place:

'*They (iPads) block the site of the wound as well, because of the shape and size of them.*' (Participant 1)

Seven of the 15 participants discussed how they had successfully used the iPad with a variety of different patient groups and ages.

"*… I think it sort of suits all ages, as long as you have the right apps. So, I have had two-year-olds using*

it and also the teenagers that love it as well.' (Participant 5)

'*I don't even think there is an age barrier; even with babies I will use the iPad.*' (Participant 9)

However, two participants described the difficulty using an iPad for distraction with older children because they were more aware of the situation and because they were thought to have less need for it:

'*I think sometimes when they are older; they are a bit wiser to what you are trying to do with distraction. You know, a 14-year-old you can't just go, "oh play on the iPad", they would be like, "no, I know you are about to rip the bandage off my leg".*' (Participant 6)

'*I don't feel we use the iPad as much in older children, that may be partly because we underestimate anxiety in the older age group.*' (Participant 12)

Trials and tribulations

While the interviewees were generally positive and enthusiastic about the use of iPads during dressing changes, they also discussed reservations about their use and factors and barriers which impacted on the integration of distraction techniques more broadly within routine care. Some participants held the view that distraction was a bonus rather than an essential aspect of care during stressful procedures, while querying the efficacy of iPads in this context.

'*The iPad is only as good as the people [health professional] who use them. It is all very well having a piece of kit, but if you haven't prepared the child or family for the procedure then it is only a piece of bling, a piece of jewellery.*' (Participant 1)

In contrast to the very positive feelings towards distraction and the iPads in the first theme, this theme included accounts of challenges, confusion, tension and conflicting opinions among different health professionals. For example, some participants felt that the involvement of the play specialists was essential to providing distraction in every dressing change, but did not think that all health professionals recognised the importance of the profession:

'*People say "oh you have the best job ever, you just play all day". Well, we don't often sit and just play, we are often thinking that child is not coping, what can I do?*' (Participant 8)

Communication problems between health professionals were also reported as being a barrier to the use of iPads and distraction. Some interviewees described being given insufficient notice of a dressing change taking place and therefore being unprepared for the procedure (a particular problem if the iPad battery needs recharging):

'*…children would play with them all the time. …if we had a child come in as an emergency, you are not going have time to charge it up.*' (Participant 13)

Others reported feeling overwhelmed with their work load during really busy times and subsequently did not necessarily contact those who could help with distraction techniques:

'*Sometimes you have to weigh up in the moment what to do. If the child is too far gone, or their site is small, sometimes it is better to get it over and done with regardless of the distraction. It is a matter of time.*' (Participant 11)

'*…if we are busy, they will be like, "Just get it quickly done"…. …it's all to do with time restraints, it is unfortunate it happens.*' (Participant 13)

Interviewees' attitudes and confidence towards using iPads and distraction seemed to be associated with their familiarity and experience of them, with education and training being key. Only four participants in this study had been formally trained in using distraction techniques, while the others had received little or no training about them during their professional education and admitted that their knowledge in this regard was limited. Of the participants who had received training about distraction, none had been trained in using the iPad in this way. Others referred to the need for an evidence-based approach to support their use:

'*…we did a little informal training about play therapy, but nothing formal.*' (Participant 12)

'*My knowledge [of the iPad being used for distraction] is minimal and I don't know its effectiveness and how you would measure it.*' (Participant 14)

Discussion

This is, to our knowledge, the first study to explore health professionals' experiences of using iPads as a distraction tool during burns dressing changes. Participants clearly saw benefits in using iPads as a means of reducing the stress and pain associated with this procedure – one which must be carried out repeatedly and can be a particularly traumatic experience for young people and their parents.[34] These health professionals described how the iPad was practical and easy to use, and how the variety of apps available meant it was adaptable to meet children's individual circumstances and developmental stages. However, the participants in this study described how the challenges of working on a busy ward with competing demands on staff time, as well as differing views on the relevance of

distraction in every situation, lack of training and the need for evidence-based care meant that iPads and distraction techniques in general were not used routinely during every dressing change.

The participants' descriptions of how they used iPads demonstrated their ability to perform a variety of the distraction techniques outlined by Koller and Goldman.[5] Their descriptions highlighted the use of iPads to deliver both active and passive distraction techniques and as a universal distraction tool, suitable for a variety of ages including children and young adults. British Psychological Society guidelines for invasive procedures[30] state that 'hand-held computers' are suitable for children aged 5–7 years, while 'video games' are recommended as being suitable for 8- to 11-year-olds.[27] The participants in our study used iPads with young children, not necessarily as an active distraction technique as presumed by Duff and Bliss,[27] but also for passive distraction by watching videos or playing music. The iPad was also used as a tool to help achieve cognitive distraction techniques for the younger patients (aged 0–4 years) through interactive games. However, Duff and Bliss[27] recommend the 0–4-year age group require both cognitive distraction coupled with sensory feedback (such as heat and texture), which the iPad in this context did not offer. Techniques which only involve passive auditory and visual attention have been considered inadequate when trying to reduce patients' perceptions of pain, since they neglect the tactile and kinesthetic sensations associated with acute pain.[35] Therefore, the iPad might best be used in combination with other tools to ensure a holistic distraction for this younger age group, and this should be considered and examined in future research.

Nevertheless, when considering older children (aged 4 years and older), the iPad can provide both physical and cognitive distraction, as these children are capable of using the hand gestures needed to interact and control[26] and thereby fully interact with it. Participants referred to iPads being used and manipulated to block the child's view of their wound and the treatment that is taking place. British Psychological Society guidelines[30] specify that a reduction in visible cues associated with threatening stimuli can aid psychological security and lower a child's anxiety.[36]

Participants in our study reported that older children struggled to engage with the iPad as a means of distraction since they were conscious about what was going to take place during the dressing change. McGrath and Hillier[37] emphasise that adolescents' perception of pain during an invasive procedure may be reduced if simple information is provided about what is happening, why the procedure is being conducted, what equipment will be used, which health professionals will be present in the room, and guidance is given about other useful distraction techniques and what sensations they may feel during different phases of the procedure.

The participants in this study also highlighted some potential barriers to the routine implementation of iPads during dressing changes in paediatric burn care. Our findings indicate the importance of a team approach, whereby all relevant members of staff are included in dressing changes and agree to making the reduction of pain and distress around dressing changes a priority. Some participants described a need to promote awareness of the role of play specialists in this regard, increase health professionals' understanding of the importance of distraction during invasive procedures and the benefits of using iPads to facilitate distraction, and provide training and education to increase their confidence in using them within routine care.

We recognise there are a number of limitations to this small, exploratory study. Specifically, while it included a range of health professionals, no members of the anaesthetic team were available to take part and it was conducted within a single burns unit, so it is has only given an insight into the use of iPads and distraction techniques employed within that particular service. Furthermore, it is possible that only health professionals with particularly strong views on the use of iPads during dressing changes elected to take part, so we cannot generalise the findings to all health professionals working in paediatric burn settings. Also, by focusing on health professionals' views while treating children and young people, we have not investigated the experiences of patients (child or adult) or parents.

Conclusions

This study explored health professionals' experiences of using iPads to facilitate distraction during paediatric burn dressing changes and highlighted the importance of combining training to deliver effective distraction techniques with good team communication. This can help to ensure that the child's psychological wellbeing is prioritised during these painful and stressful procedures, with the potential to facilitate a reduction in anxiety and pain during subsequent treatment, and thereby possibly easing the process for everyone involved.

Clinical implications

The use of iPads as a tool to facilitate distraction among other patient groups undergoing stressful procedures warrants further research, as does their efficacy in reducing pain, anxiety, the amount of sedation required to carry out procedure and the costs of care. Furthermore, the current study would be complemented by research exploring patients' and parents' views on the use of the iPad in this context. Protocols, guidance and training resources would be useful to support and encourage health professionals to use iPads to provide distraction for children of different ages, patient groups and cognitive abilities. Ways of effectively integrating and implementing iPads within routine stressful procedures should be examined and, as part of this, a procedural checklist might help to ensure that the suitability of distraction is considered within every procedure. Future guidelines for paediatric invasive procedures should include the use of touchscreen technologies.

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