Parental Experiences of the Pediatric Day Surgery Pathway and the Needs for A Digital Gaming Solution: A Qualitative Study

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Abstract

Background: The parents of hospitalized children are often dissatisfied with waiting time, fasting, discharge criteria, postoperative pain relief and postoperative guidance. Parents' experiences help care providers to provide effective, family-centered care that responds to parents' needs throughout the day surgery pathway.

Objective: The objective of our study was to describe parental experiences of the paediatric day surgery pathway and the needs for a digital gaming solution in order to facilitate the digitalisation of pathway.

Methods: This was a descriptive qualitative study. The participants (n=31) were parents whose children were admitted for a day surgical treatment or magnetic resonance imaging (MRI). The data was collected by using an unstructured, open-ended questionnaire. The qualitative data was analysed anonymously by conducting an inductive content analysis. Reporting of the study findings adheres to the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist.

Results: Parental experiences of the children's day surgery pathway included three main categories: (1) needs for parental guidance, (2) needs for support, and (3) child involved in his/her own pathway (e.g. consideration of an individual child and preparation of child for treatment). The needs for a digital gaming solution were identified under one main category: the digital gaming solution for children and family to support care: (1) preparing children and families for the day surgery via the solution, (2) gamification in the solution, and (3) connecting people through the solution.

Conclusions: Parents need guidance and support with the children's day surgery care pathway. A digital gaming solution may be a relevant tool to support communication and to provide information on day surgery. Families are ready for and open to digital gaming solutions that provide support and guidance and engage children in the day surgery pathway.

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Keywords: Anxiety; Children; Day surgery; Delivery of health care; Digital Solution; Nursing; Pain; Qualitative study; Software; Technology

Introduction

The Global Observatory for eHealth has defined mHealth solutions as “medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless devices” [1]. These digital or connected health services or solutions are changing medical and public health practices [2]. However, assessment frameworks should respect the needs and capacity of each medical system or country [3]. Gaming and gamification are areas of mhealth which can expand users’ acquiescence with health interventions and improves capability to self-administering their condition and adhesion to treatment [4].

Day surgery procedures are more common in children than inpatient procedures [5]. Approximately 3.4–10 % of children under 17 years old experience hospital stays in developed countries like the US and Europe per year [5-7]. Day surgery patients are admitted, operated on and discharged on the same calendar day [8-9]. Surgical conditions constitute a significant proportion of the global burden of diseases [10]. However, careful patient selection, refinements in surgical and anaesthetic techniques and devices, and successful patient outcomes have contributed to the utilisation of surgical processes with early discharge [11].

Outpatient care also includes patients who are sedated for magnetic resonance imaging and are discharged after treatment [12]. Guidelines from the Association of Anaesthetists and the British Association of Day Surgery underline the importance of instructions concerning day surgery and its flow [11]. An ideal day surgery pathway includes minimising waiting times, information on day surgery procedure for patients, a routine preoperative check on the day of admission with procedure, analgesia and other postoperative information at discharge, and eventually instructions for telephone follow-up [9]. The information provided should be of high quality, procedure-specific for families, and age-appropriate for children [11, 13]. Patients should be admitted to the day surgery unit as close as possible to the time of their surgery.

This article focuses on parental experiences from the paediatric day surgery pathway. Our

study is part of a project where the ecosystem of hospitals, researchers and technology providers together with children and families are co-developing a digital gaming solution for the day surgery path.

Background

According to the previous meta-analysis, digital gaming solutions can reduce children's preoperative anxiety and increase parental satisfaction [10]. In addition, digital gaming solutions can be considered non-pharmacological distraction tools for children. Parents' experiences may help care providers to deliver more effective, family-centred care that responds to parents' needs throughout the day surgery pathway [10]. Family-centred care considers the individual needs of parents and children [15] and emphasises the role of written information intended to reduce parental anxiety and stress regarding day surgery [16-17]. In child-centred care, a child is a person with joined participation and partnership who has their own voice and is considered competent [15].

In day surgery processes, appropriate preoperative preparation is crucial [18-19]. Usually day surgical treatment is a unique experience for both children and families. The incidence of preoperative anxiety in children varies between 40% and 75% [20-21]. In order to avoid unexpected stress, the whole family needs to be prepared for upcoming surgery [22]. Untreated anxiety is associated with increased intensity of pain afterwards [22-24]. In addition, parental anxiety has an enormous effect on children's preoperative anxiety, which also correlates with increased postoperative pain in children [24]. Correspondingly, postoperative pain is associated with parental satisfaction in paediatric day surgery [25].

The parents of hospitalised children perceive high levels of stress and anxiety [26]. In addition, they are dissatisfied with waiting times [28-29], fasting [29], discharge criteria [9, 30] and postoperative

pain relief [25]. Parental satisfaction with treatment and care itself, however, is good [25].

Our study addresses the gap in evidence by focusing on the information and needs of parents. In addition, the expectations for a digital gaming solution were addressed to support the digitalisation of the paediatric day surgery pathway. The research questions were:

1. What are the experiences of parents of care in the paediatric day surgery pathway?
2. What are the needs of parents for a digital gaming solution in the paediatric day surgery pathway?

Methods

Design

This was a descriptive qualitative study, based on experiences of parents of hospitalised children [31-32].

Participants and settings

Patients were recruited for the study using convenience sampling and were asked to volunteer in the study [31]. The inclusion criteria were being the parents or having custody of the hospitalised child who was receiving day surgical treatment at the hospital, the ability to understand and write in Finnish, and the possibility to answer the questionnaire via laptop or mobile app. The participants were selected after having received knowledge of the research topic [33], which was having recent experience of the children's day surgery pathway in a selected hospital.

A total of 31 parents participated in our study. The participants were parents whose children were admitted for a day surgical treatment or MRI requiring anaesthesia. The respondents consisted of parents (N=31) whose children were admitted to otolaryngologic surgery (*n*=7), plastic surgery (*n*=3), oral/dental surgery (*n*=1), ophthalmic surgery (*n*=1), orthopaedic surgery (*n*=7), soft tissue

surgery (*n*=3), gastroenterological surgery (*n*=5), vascular surgery (*n*=1), and magnetic resonance imaging (*n*=3). Of the 31 parents, 23 were female aged between 30 and 39 (74.2%) and eight of the parents were male.

The study was conducted at the university hospital in Finland, a 140-bed tertiary care paediatric hospital. The hospital provides specialised health care in paediatrics, paediatric surgery, child neurology and child psychiatry. In addition, the hospital has been assigned national treatment responsibilities in specified paediatric conditions, e.g. cardiac surgery and organ transplants. In 2019, a total of 6,883 surgical operations were performed, of which 3,300 were day surgery procedures.

Data collection

The data was collected using an unstructured questionnaire. The questionnaire was planned and designed via remote meetings by a panel of seven specialists from the University of Oulu, VTT Technical Research Centre of Finland Ltd, and Helsinki and Oulu University Hospitals, in 2018. The panel included paediatricians, nurses and researchers. The questionnaire was designed to gather information on the children's current day surgery pathway and, with the help of findings from an earlier study, enough evidence to develop a more digitalised pathway [2]. The data collection was designed to address the research questions using three demographic and six open-ended questions (Table 1). The questionnaire was tested in March 2019 by a PhD student and a professor in the selected hospital with parents who were waiting for treatment with their children. The parents were given an invitation to respond to Questback Essentials' web-based unstructured questionnaire via a QR code using their own mobile phones (Questback, Finland). Five parents responded, and the questionnaire could be considered usable.

Data collection took place between October and December 2019. The research nurse recruited voluntary respondents from the hospital's recovery room while children were in the post-anaesthesia care unit. The parents answered the anonymous questionnaire via their own smartphones or laptops. If the respondent did not have a smartphone or a laptop, one was provided for them by the research nurse. The researchers were not able to identify individual respondents.

Table 1 Unstructured questionnaire for parents

Titles
1–2 Respondents demographics
3 Has your child been in a day surgery unit? Yes/No
4 What kind of treatment has your child had?
5. What kind of information did you receive from hospital staff about what is going to happen during your child's day surgery treatment?
6. Could you describe what kind of support you received during your child's treatment?
7. Can you tell us how your child was involved in the care path by medical staff?
8. Did you have access to any treatment-related games during your child's care path that you would have played with along with your children?
9. (Demo of the Icory solution) What do you think about this solution? What kind of solution should be available?

Data analysis

The qualitative data was analysed by conducting an inductive content analysis, which included three main phases: preparation, organisation and reporting [31-32]. The data was analysed using NVivo 12 qualitative research software (QRS International 2020). Demographic data is presented using frequencies and percentages.

First, the data was evaluated for quality by three researchers (AR, MJ & TP). The data was transferred to NVivo 12. In the analysis process, initial impressions were written down as notes. Second, in the analysis phase the data was abstracted into open codes and transferred into tables.

Open codes were grouped according to the similarity and those grouped into categories [34]. Third, those categories were named using a word that was characteristic of the content and were formed by sub-categories. Similar sub-categories were grouped together and called upper categories. The process produced 294 open codes, 21 sub-categories, 9 upper categories and four main categories. The data analysis was conducted by two researchers (AR & MJ), discussed and agreed upon by three researchers (AR, JM & TP) and commented on by the researchers who developed the questionnaire (OH, MP & PL).

Rigour

Rigour was ensured using the criteria of credibility, dependability, confirmability, transferability and authenticity [31, 35-36]. Credibility and dependability in this study were ensured by designing the questionnaire based on early studies [2, 21, 37] and based on the actual needs of the selected hospital. Confirmability was established in the analysis process through researcher triangulation (AR, MJ & TP). The preparation phase included the definition of inclusion criteria of the participant, planned data collection in questionnaire format to research data saturation, and selecting the unit of analysis. Transferability was established in this study by describing the hospital environment of the research to enable transfer data results in a similar context. Authenticity was ensured through quotations to indicate the richness of data [36]. The reporting phase was performed systematically according to the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Supplementary File 1, [38]).

Ethical considerations

The study was reviewed by a local ethical committee (Decision number 3181-2018) and was granted a research permit (Decision number 284-2019). The aim of the study was verbally explained to the

respondents by the research nurse and they were informed that responding to the questionnaire was entirely voluntary. The questionnaire was designed so that it would be impossible to identify the respondents. The study followed the Helsinki Declaration [39]. All participants were informed about the voluntary nature of the research [40].

Results

Analysis of the data for the first research question revealed three main categories related to the parents' experiences of the children's day surgery pathway: 1) needs for parental guidance included two upper categories: Content of information and patient flow during the day surgery pathway; 2) needs for support in the children's day surgery pathway included the upper categories of psychological support for children and families and physiological support for children; 3) child involvement in their own pathway included upper categories: consideration of an individual child and preparing a child for treatment (Table 2).

Analysis of the data for the second research question revealed one main category: a digital gaming solution for children and families to support care and included three upper categories: preparing children and families for the day surgery via the solution, gamification in the solution and connecting people through the solution (Table 3).

Needs for parental guidance

The parents described their experiences and their own ideas regarding the information that could help both families and children solve the challenges they experience during the day surgery pathway. Identified categories were related to the content of information and patient flow during the day surgery pathway.

Content of information

That category included two sub-categories: transparency of the pathway and analgesia and amnesia. Generally, the content (e.g. admission instructions, dining, fasting, overnight stay, pain management, parking, patient flow including preoperative preparation, time and place) of information was considered sufficient. For instance, one parent wrote: *"I think we got proper information throughout the whole treatment process. They told us where to go and how to prepare for the treatment."* However, the respondents had faced challenges regarding the transparency of the pathway and analgesia and amnesia, which are sub-categories of content of information.

Transparency of the pathway included needs for knowledge of information concerning the children's day surgical pathway. Parents had faced challenges (e.g. stages and milestones, procedure). According to parents, there is a lack of knowledge regarding the discharge criteria. Also, sudden changes had brought about a challenge in obtaining information. For instance, one respondent wrote: *"It was supposed to be a day surgery treatment, but our child needed to be monitored overnight."* Correspondingly, respondents made suggestions related to the instructions: *"I would like to have better instructions on what to be aware of and what not to do with a surgical wound."* According to parents, a digital solution with different kinds of features (e.g. email) could be utilised in order to enhance information transfer, as one of the respondents remarked: *"Yeah, an email could have been a working solution* (for providing information about day surgery)*."* The implementation (e.g.

individual counselling delivered via face-to-face contact and telephone, written counselling delivered via letter and e-mail, SMS reminders) of information transfer was considered sufficient. The following excerpt from one of the parents expresses this view: *"The flow of the care pathway was well communicated by the medical staff on the day, before the treatment, and before and after the treatment in the recovery room."*

Analgesia and amnesia included needs for information concerning pain management. According to respondents, there is a lack of information related to postoperative pain management and the intensity of treatment-related pain. One of the respondents maintained: *"We don't know anything about that* (pain management at home) *yet, I have asked about possible pain but..."* In addition, there is a lack of knowledge related to amnesia/sedation. For instance, one respondent wrote: *"The one thing we were worried about was how amnesia would go and we asked about it. However, that was confirmed in the operation room."*

Patient flow during the day surgery pathway

The parents described their experiences and their own ideas regarding patient flow during the day surgery pathway. Identified categories were related to the physical environment, waiting time, and roles and responsibilities, which are sub-categories of this upper category.

Physical environment was related to the lack of information regarding free parking and lack of information guidance signs. The respondents faced challenges regarding parking and parents' waiting areas. According to the respondents, more information about the free car park and waiting places needed to be added to the information letter. One of the respondents described the challenges: *"We haven't been to the place* (hospital) *before. I verified the location of the car park from the website."* In addition, *"The only thing was that the request for entry to the parents' living room was made too late."*

Waiting time was related to the main challenges and needs. The arrival time, for instance, was considered to be the same as surgery time. The following excerpt from one of the respondents expresses this view by stating: *"We had time for the treatment but still we had to wait with other parents for 2–3 hours."* Overall, the waiting time was considered too long whereas more information regarding the remaining waiting time is warranted. The following excerpt from one of the respondents expresses these views: *"There should have been some kind of information about how long our waiting time* (for the treatment) *time would be."* The timing of patient counselling was also considered non-optimal in certain circumstances.

Roles and responsibilities were related to the challenges patients and parents faced regarding the hospital staff. It was unclear how and who would announce what. Despite certain promises, surgeons did not share information about the surgery before and/or after surgery, or shared information about surgery superficially and briefly. For instance, one respondent wrote: *"There was information on the screen in the waiting room that the doctor would call after the treatment, but this never happened."* In addition, the answers received were somewhat indicative/suggestive. However, the respondents made some suggestions regarding digital gaming solutions and child involvement in their own care pathways.

Needs for support

The second main category included two upper categories that parents described as needs for the day surgical pathway: physical support for children and physiological support for children and families. The received support (e.g. explanations, parents' involvement, support from nearby, friendliness of staff) was considered sufficient. In addition, most of the respondents felt that the service provided by the hospital was friendly, attentive and informative.

Physical support for children

The category was related to the challenges of eating after an operation and environmental safety. Conflicting information was observed related to post-surgery meals. Meal requirements post-operation was referenced in many responses, as was the need for hearing protectors for sound-sensitive children.

Psychological support for children and families

This category included the need for rewards for children after operation, the timing of guidance from nurses in sudden situations, the role of parents and timing in sudden situations, and parents describing the lack of psychological support. Parental involvement was also related to the challenges in their role. One respondent stated: *"It was hard in the operating room (*before anaesthesia), *when you should be focused on your child's excitement and at the same time matters relating to anaesthesia."* One of the respondents felt that their psychological needs were ignored in hospital and mentioned that: *"Psychological needs were not taken into account and they* (hospital staff) *could have asked us about it."*

Child involvement in his/her own care pathway

The parents described their experiences and their own ideas regarding their children's involvement in their own care pathways. The identified categories were related to consideration of an individual child and preparation for treatment, which are upper categories in the main category.

Children's involvement in their own care pathway (e.g. answering the child's questions, talking to the child, turning attention elsewhere, considering the child's fear, encouraging and praising the child, giving time to situations faced by children, listening to the child, involving the child in the care path, taking the individual into account) was considered sufficient. For instance, one respondent stated: *"My child was also allowed to ask questions that bothered him, and they were answered*

really well." The respondents had, however, faced challenges regarding consideration of an individual child and preparing a child for treatment, which were sub-categories for this main category.

Consideration of an individual child

This category was related to the needs of children with special needs and giving time for children to calm down. The individual needs of sound-sensitive children should be taken into account.

Preparation for treatment included

This category included challenges related to children's needs for parents in the operation room before anaesthesia, their needs to familiarise themselves with the hospital environment in advance and having time in frightening situations. Respondents described it as giving time for children before their operation: *"Going to the operating room caused a little extra stress, as the speed was faster there than the speed in the restroom. It would have been good to calm the child down a bit before starting the operation."*

Table 2 Parental experiences of the care in the children's day surgery pathway

Simple statements	**Sub-category**	**Upper category**	**Main category**
• Lack of knowledge regarding operating theatre activities • Unexpected follow-up overnight • Unexpected changes in day surgery pathway • Lack of knowledge regarding day surgery pathway • Lack of instruction regarding surgical wound • Instructions could be sent by email • Instructions in the information letter should be updated	Transparency of the pathway	Content of information	Needs for parental guidance
• Lack of knowledge regarding pain	Analgesia and amnesia		

management • Need for pain management guidance • Need for information about anaesthesia			
• Lack of information regarding free parking • Guidance signs are needed • Permission for entrance to waiting room in time	Physical environment	Patient flow during the day surgery pathway	
• The overall waiting time was considered too long • Waiting is challenging with hungry children • Waiting for operation was considered too long • Progress regarding waiting time should be shared by nurse • Unsustainable schedules	Waiting time		
• Doctor did not call following operation • Discrepancies in responsibilities • Superficiality of information • Nurses are better at sharing information	Roles and responsibilities		
• Meal requirements • Unsuitable food after operation • Conflicting information regarding available meal	Eating after operation	Physiological support for children	Needs for support
• Hearing protectors for sound-sensitivity	Environment safety		
• Rewards are pleasing • Parents' psychological needs should be enquired about • Parental well-being should be considered	Rewards/ trophies Psychological needs	Psychological support for children and family	
• Correct timing for nursing guidance • Parental role and timing in sudden situation	Timing of guidance		
• Needs of sound-sensitive children • Own devices for sound-sensitive child	Individual needs	Consideration of individual children	Child involvement in his/her own pathway

• More time should be given for children by nurse • Calming should be ensured before operation	Giving time for children		
• Familiarisation with treatment should be ensured	Familiarisation for treatment	Preparation for treatment	
• Pictures to help preparation • Games to help preparation	Preparation with games and pictures		

Digital gaming solution for children and families to support care

Respondents described their needs for a digital gaming solution that could help children and families in children's day surgery care. This included three upper categories: preparing children and families for day surgery, gamification in solutions, and connecting people through the solution (Table 3).

To date, games are not implemented in the paediatric day surgery pathway. However, parents reported positive attitudes towards a digital gaming solution for paediatric day surgery. For instance, one respondent noted: *"Today's kids are born at this time of technology, so I think games could work well for kids of a certain age."* In addition, attitudes towards rehabilitation through playing and gaming were positive. The identified requirements for digital gaming solutions was divided into seven sub-categories.

Preparing children and families for the day surgery in a solution

The proposed needs for a digital gaming solution were related to three different items: preparing via a digital gaming solution, virtual familiarisation with the care environment, and managing the waiting time with a solution. These are sub-categories of the upper category.

Preparing via a digital gaming solution

This category included aspects that could enable children to prepare for their treatment. The solution

should include general information about surgery, whereas instructions concerning treatment was supposed to be already available. Information storage in the game would decrease the need for information retrieval. According to respondents, the developed digital gaming solution should be easy to use. An informative gaming solution would reduce the need for Googling, according to one respondent: *"That kind of solution would reduce need for Google."*

Virtual familiarization with the care environment

Virtual familiarization with the care environment included parental needs for a virtual tour for children and families, information about the operating room via virtual visits and the ability to see the hospital via the solution. In addition, a digital gaming solution could include pictures of genuine spaces in the hospital.

Managing the waiting time with a solution

This category, managing the waiting time with a solution, was seen as an important requirement for the solution. It would be an important part of a solution for parents to receive information about the waiting time following their children's treatment. In addition, the solution could also be applied in other circumstances to relieve waiting.

Gamification in the solution

Gamification in the solution included the following sub-categories: gamification to overcome hospital anxiety and fear, and gamification in support of care. Parents' needs for gamification was seen as being available via the solution.

Gamification to overcome hospital anxiety and fear

This category included parental needs for solutions for children. According to parents, a digital gaming solution could include all sorts of fun and interactive features (e.g. videos, games, music) to reduce fear. The following excerpt from one of the respondents expresses this view: *"After all,*

children can't help but like everything interactive and cool. Even if the device offers nothing but fun for the child, it will certainly be helpful to relieve fear."

Gamification in support of care

According to respondents this could include age-appropriate information regarding the most common types of surgery beforehand. According to parents, certain games could be utilised for the preparation for surgery as well as postoperative recovery (e.g. rehabilitation). For instance, one respondent stated: *"It would be good to prepare themselves for treatment via a solution."*

Connecting people through a solution

This included two sub-categories: interaction between medical staff, family and children, and peer support. The parents stated that the digital gaming solution could enable interaction between the hospital and families and enable peer support: *"I like the thought that with the help of the solution parents could connect with nurses."* According to parents, a digital gaming solution could include children's own positive stories regarding their day surgery pathway. In addition, a digital gaming solution could enable the sharing of feelings with others in order to reduce fear. The following excerpt from one of the respondents expresses this view: *"Being able to share their feelings with others going through similar measures could be a good way to address their fears."*

Table 3 Parental needs for gamification solution in the children's day surgery pathway

Simple statements	Sub-categories	Upper categories	Main category
• General information about surgery • Instructions available beforehand in solution	Preparing via digital gaming solution	Preparing children and families for the day surgery via the solution	

• Virtual tour • Familiarisation with operation room beforehand • Visibility of real environment	Virtual familiarisation with the care environment		Digital gaming solution for children and families to support care
• Information on waiting time • Distraction from waiting	Waiting time in solution		
• Games with music • Videos in solution • Fun in order to relieve fear • Games for reducing fear	Gamification to overcome hospital anxiety and fear	Gamification in solution	
• Games for preparation • Games for rehabilitation • Age-appropriate material for children	Gamification in support of care		
• Interaction between nurses and patient • Support and guidance from staff not from game	Interaction between medical staff, family and children	Connecting people through the solution	
• Children telling stories about treatment via solution • Ability to share feelings	Peer support		

Discussion

Principal Results

This is the first qualitative study to explore parental experiences throughout the entire paediatric day surgery pathway in order to support pathway digitalisation in the selected hospital. Our findings revealed that although the current content and information transfer was considered sufficient, parents

expected 1) better guidance related to the content of information flow, 2) more psychological support, and 3) involvement of the child in their own care pathway. Additionally, it was found that there is a need for a digital gaming solution that gives the required support of information and helps families to be better prepared for the coming treatment process.

Strengths and limitations

The results present the experiences of the needs of parents in the children's day surgery pathway. Almost all children had been in day surgery, whereas 3% of the respondents had undergone an MRI. The number of respondents was reasonably small – only 31 – and the text material they produced that was analysed was mainly brief, as it usually is when responding via the internet. However, the respondents had a fresh perspective on the care the hospital provides to their children, which strengthens our results.

There may have been a greater breadth of data if there had been an opportunity to conduct individual or focus group interviews. Then the interviewees could have provided richer material to be analysed or different perspectives could have been clarified. However, the saturation was achieved, and the respondents produced text that included rich material for our inductive content analysis.

It was not possible to get feedback on the results at an organised event at the hospital because the respondents were anonymised, and they did not ask the research nurse any further questions while responding to the anonymous questionnaire. The results are transferable to similar contexts where a hospital has developed its own digital environment, but the generalisability of the results would require quantitative research with a large sample size.

Comparison with prior work

The need for better guidance related to content flow is in line with previous studies [16, 19, 25], who

explain a situation where the parents were unfamiliar with how to conduct postoperative pain management for their own child. In recent studies, parents also needed more guidance regarding fasting [19, 29], equipment used in the operating and recovery rooms [16] discharge criteria [9, 30] and postoperative complications [19, 25]. The need for psychological support is in line with previous literature, in that participants were most frequently dissatisfied with waiting times [16, 28-29, 41]. Thus, interventions aimed at reducing waiting times and raising patient satisfaction are warranted.

According to respondents, the digital gaming solution could be used to help families be better prepared for the coming treatments. This could include a virtual tour of a hospital to familiarise children with the environment beforehand. In the study by Carlsson & Henningsson [42], the researchers realised that visiting the operation room might not reduce parents' or children's anxiety in surgery care situations. This finding is contradicted by the study of Rantala et al. [14], who argue based on a recent meta-analysis that web-based interventions (e.g. educational web-based programmes, age-appropriate streamed videos) could be used to reduce children's anxiety [14]. In addition, in another study by Rantala et al [19] health specialists saw a digital gaming solution, developed for hospital environment including virtual visits in hospital and for different surgeries, would help family and children to be better oriented to a coming treatment.

Overall, the results of the study are in line with the literature on patients' expectations and needs related to hip and knee arthroplasty [43]. In this study the patients suggested that they needed a digital solution that allows for better real-time communication methods (e.g. information transfer, discussion forums), and patient counselling (e.g. resources, content and implementation) In addition, our results support the previous literature on treatment pathways for surgical patients [43-46], but the studies have not focused on the pediatric day surgery pathways.

Conclusion

The parents of children in day surgery need reliable information about children's day surgery. Children must be involved in their own day surgery care path. The parents of children in day surgery were open to digital gaming solutions. They expressed their thoughts on what kind of solution would be relevant to clinical practice and could positively affect nursing in hospitals. The digital gaming solution should be developed for the needs of children and should include important information about day surgery to be used by families. This information can be used for developing digital solutions for hospital environments.

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Conflict of interest

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Abbreviations

MRI: magnetic resonance imaging

COREQ: Consolidated Criteria for Reporting Qualitative Research
PDA: Personal digital assistants
QR code: Quick Response code

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Supplementary Files

CONSORT (or other) checklists

Coreq checklist for qualitative research.
URL: https://asset.jmir.pub/assets/533d6e26a8dc630629e2e2ceef9a508a.pdf