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'This Doesn't Feel Like a Hospital': Children's Experience of the Outdoor Care Retreat Versus Conventional Hospital Design

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Abstract. This study explores how children experience two different locations at Oslo University Hospital in terms of their architectural design and emotional potential. The first location includes a conventional modern hospital wing, whereas the other is a uniquely designed cabin in natural surroundings outside the hospital building, the Outdoor care retreat. The research is a psychological study of how various locations activate cognitive schemas and lead to elicitation of different emotional responses and modes of behavior for children. Participants included 17 children aged 7 to 16, whereby 11 children had no previous experience with hospitalization for a serious medical condition and 6 children were undergoing treatment or follow-ups related to a medical condition at the time of data collection. The data material consisted of walking interviews accompanied by a semi-structured interview guide. The qualitative material was analyzed by applying reflexive thematic analysis and categorized into themes. Study findings illustrate that children experience the environments differently in terms of physical and emotional restrictions. Overall, the children prefer architectural spaces with direct contact to nature or design that mimics natural environments, in addition to being exciting, friendly, and intimate. In these environments, children feel less restricted, more relaxed and more free to express themselves and a range of emotions. This study proposes that spending time in such environments will increase resilience and hospitalization satisfaction for children admitted to hospitals for longer periods of time. In turn, this could have important implications for practice if included in the design of future health care facilities.

Keywords. Healthcare design, research with children, biophilic design, research-based design

1. Introduction

Conventional hospital architecture and design are commonly associated with environmental features that bear little resemblance to surroundings that most healthy children frequent as part of childhood. Still, for some children these spaces are temporary

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homes, especially in cases where children have serious medical conditions that require long-term hospitalization. This implies the need for physical environments that are therapeutic for child patients. The present study aims to explore two different locations at Oslo University Hospital (OUS) that vastly differ in their architectural design; one is considered a typical example of conventional hospital design, whereas the other is considered unique and different in this context. The latter location is the Outdoor care retreat (OCR), a small cabin in natural surroundings outside the conventional hospital buildings [1]. The present study explores how these environments are experienced by children and how this experience is associated with activation of different cognitive schemas, emotional responses, and related modes of behavior.

1.1. Children's experience of hospital environments

Several studies have explored the association between features in the physical environment and children's experience of hospitalization. Central to this experience are sensory experiences such as temperature, smell, decoration, presence of toys and computers, artwork and pictures [2]. Watts and Wilson [3] have identified four aspects of the physical environment in a pediatric clinic that influenced hospitalization satisfaction for children and their parents. These include architectural features (e.g. room size, window placement and views), interior design features (e.g. materials, colors, furniture, décor), ambient features (e.g. light, acoustics, temperature), and patient and family centeredness (e.g. privacy, recreational spaces, gardens). Spending time as a family in hospital gardens is proposed to increase satisfaction and well-being as it can act as a buffer against bodily stress and psychological distress commonly associated with hospitalization [4–7]. Access to nature has been shown to have a positive effect on both physical and affective measures of stress [8–11] and has been shown to improve mood and satisfaction among child patients [12]. Previous research on the OCR at OUH has also found that affordances provided by nature influence therapeutic work with children [13].

Reduced worry can be achieved in environments that elicit positive emotions and grab the attention of the patient while balancing the attentional effort needed [14]. Indeed, opportunities for play, low interaction exploration, discovery, and distraction, can relieve anxiety in a children's rehabilitation hospital [15]. Examples of negative distractions can be noise, such as people talking on the phone, rustling paper, pagers, radiators, and staff talking. These have been found to have a negative impact on children in a healthcare context [2]. Furthermore, studies have found that lack of privacy can cause stress to patients and their families [3], and that satisfaction increases in spaces that are seen as encouraging, healing, and protective [16, 17]. The latter is defined as spaces high on comfort, safety, and privacy.

1.2. Schemas, modes of behavior and emotion regulation

Experiencing a serious illness accompanied by hospitalization can invoke anxiety, stress, and fear in children that can linger long after hospitalization ends [18, 19]. The negative consequences can relate to repeated medical tests and treatments but are also associated with spending time in unfamiliar environments [12, 20–23]. This highlights the need for restorative hospital environments that can trigger familiarity, support positive emotions, and reduce stress.

People navigate physical environments using mental models, or schemas, developed in childhood and beyond. In cognitive psychology, a schema is considered a structured pattern of thoughts and behaviors. In Piaget's [24] cognitive theory, 'schemas' is one of three components in his cognitive theory of child development, and in his view, schemas are the building blocks of intelligence and a way to organize information. It allows creation of mental models about the world and environment individuals live in. The information guide individuals on how to react to incoming stimuli and the appropriate behaviors that follow. A collection of behaviors can be seen as a mode of behavior; a temporary way of being that is triggered by activated schemas about a situation or an environment [25]. As part of schema therapy, Young, Klosko, and Weishaar [25] describe four child modes of behavior. The first is the vulnerable child, where the child can feel alone or thrown aside. The second is the impulsive child, where the child engages in impulsive and reckless behaviors. The third is the angry child, frequently characterized by yelling, throwing things, and little concern with consequences of their behavior. These maladaptive modes are thought to be the result of unmet emotional needs. The happy child, on the other hand, is a child that has its emotional needs met and feels accepted and loved. When a child is in this mode of behavior, they are able to engage in play and have fun.

The psychological literature agrees that emotions are psychological states based on subjective experiences with corresponding expressive behaviours (e.g. bodily, facial) and physiological responses (e.g. respiration, heart rate) [26]. The modal model of emotion by Gross [27, 28] posits that emotions begin with a psychologically relevant situation that is appraised based on external features in the environment or internal representations in the individual (e.g. illness or spending time in a hospital). This appraisal leads to changes in physiological and behavioural response systems that characterize emotion (e.g. fear, uncertainty, excitement). In situations where emotions appear to be ill-matched to the situation, the person attempts to regulate the emotional response to better serve the person's goal [29]. For instance, if a child experiences negative emotions while in a hospital environment, they might withdraw if they perceive the display of negative emotion as ill-suited for the environmental context. This could imply that children suppress certain emotions and behavioral responses. Emotion suppression requires efforts from the individual that can lead to increased negative emotions and reduced cognitive performance [29].

1.3. Environments for emotion regulation

Research from environmental psychology demonstrate how certain environments appear better suited for individual self-regulation of emotions in times of psychological need [30]. For instance, research into place attachment and favorite places has shown how spending time in these settings lead to increased well-being and a reduction in negative affect and stress [31, 32]. Favorite places are defined as places where the individual has a sense of emotional bond or attachment, and these can be places in one's home, in other settings in the built environment, and in many cases in natural environments [32]. Indeed, young people report that favorite places are more restorative than unpleasant or neutral places [33]. Once people have developed an attachment to a place, they may also rely on this place for emotion regulation [34]. Favorite places may be connected to self-regulation through feelings of familiarity, positive affective appraisals, belonging, presence of memories, and control over the place, which may in turn increase self-identity and self-esteem [30, 32]. Thus, we may assume that a child will experience

increased well-being and ability to regulate emotions in environments that are sufficiently overlapping with a familiar environment, likely one to which the child is attached (see [13, 35]. The notion of a secure base is well established in attachment theory (see e.g., [36]). The world can be both threatening, and unthreatening, and when the child becomes distressed, it seeks contact with the caregiver. The dynamics of attachment are not only about feeling safe, but also about feeling safe enough to explore [34, 37]. We can think of these as different modes of operation. The modes are probably influenced by what affordances are available, what schemas a person has in a given situation (e.g., situational understanding), and familiarity of the setting (see [13]). We suggest that the environment is one important factor when the mind constructs such semi-permanent modes of operating, in the sense that modi of feeling secure enough to explore or of feeling insecure, emerges (regularly) based on available information. We use emotional potential to refer to the extent to which one expects emotional effects from being in an environment [38]. To our knowledge, no existing research has applied the concepts of cognitive schemas and modes of behavior to discuss experiences of the physical environments at hospitals using children as research participants.

1.4. The present study

This study aims to explore children's experience of two distinct environments at Oslo University Hospital, while considering the cognitive schemas and emotional responses these environments trigger, as well as related modes of behavior. This led to the following research questions:

RQ1: How do children describe the experience of the Outdoor care retreat compared to spaces with similar functions in a conventional hospital space?

RQ2: How do children describe the emotional potential and behavior modes these environments trigger?

2. Method

2.1. Research design and researcher reflexivity

To explore the research question, we applied a qualitative and open research design that would allow consideration of contextual influence, based on Reflexive Thematic Analysis (RTA) [39]. RTA is a family of methods, and the route to design must be considered and coherent. We adhere to a critical version of RTA, informed by social constructionism, open for latent and implicit interpretation of meaning in the data material. This means that how the children describe the environment is not a direct reflection of their reality, but rather a reflection of how they make meaning out of their physical environment according to their social and cultural upbringing and context. The analysis is deductive in the sense that we used psychological theories on cognitive schemas and behavior modes [25], as well as emotion regulation [29], as a lens in the analytical process.

Braun and Clarke [39] highlight the researcher's active role in knowledge production as part of reflexive thematic analysis and subjectivity is valued. Aligned with how researchers should reflect on how their background influences the interpretation of

data and production of knowledge, it is considered relevant for the present study that the authors are familiar with environmental psychology and research-based design and the role of nature and physical environments for well-being and health. The last three authors have previously published research on the OCR. The third author works therapeutic with children at the OCR and has first-hand experience with how the children behave in the different environments.

2.2. Participants and data collection

The data is collected through walking interviews [40] with seventeen children divided into two groups, 1) eleven children aged 7 to twelve years with no previous experience of hospitalization related to a serious health condition and, 2) 6 children aged 8 to sixteen with current or recent experience of receiving hospital treatment due to a serious health condition. Participants are presented in table 1.

Table 1. Participants (N = 17)

Participants	Age
Group 1 (no health condition) n = 11	7 – 12 (mean: 10.2)
Group 2 (health condition) n = 6	8 – 16 (mean: 13.3)

The interviews followed a semi-structured interview guide. Sample questions from the semi-structured interview guide are presented in table 2. In addition, the child affective facial expression set (CAFÉ) [41] was used as a prompt to allow children to reflect on the emotional potential of the different locations. These include photos illustrating basic emotions (sad, anger, happiness, fear). The walking route included five main destinations: 1) outside the main hospital entrance, 2) the reception area in the mother/childcare unit (main waiting area for patients), 3) a therapists' office at the Department of Child and Adolescent Mental Health in Hospitals at OUH (DCAMHH), 4) outside the OCR, and 5) inside the OCR. The OCR serves multiple purposes while the same purposes require different rooms in the conventional hospital spaces. To decide which rooms to include from the conventional hospital wing, the research team analyzed and discussed various needs, functions, and purposes of the OCR and the conventional hospital spaces and finally decided on the chosen destinations. This decision was largely based on the experience and familiarity with spaces by the third author as a frontline employee at DCAMHH. The locations share the functions of being somewhere the children can play, wait, interact with family, and receive psychotherapy.

Table 2. Samples from the semi-structured interview guide

Topic	Subtopic
Demographics	Age Gender Previous experience with hospitals/hospitalization Personal interests and hobbies
Destination 1: Outside Oslo University Hospital	Have you been here before? What does this place look like? What was the first thing you noticed?
Destination 2: Main reception mother/childcare unit	What do you think of this place? What would you like to do in here?

	If I asked you to describe this place to a friend, what would you say? Is this a place for adults or children? Can you please go to the place you like the most/least in here? If you were sad* (*happy, sad, angry, scared), do you feel this is a good place to be?
Destination 3: Therapists' office DCAMHH	Same as destination 2
Destination 4: Outside the Outdoor care retreat	Same as destination 1
Destination 5: Inside the Outdoor care retreat	Same as destination 2
Overall	Are there some places that we have visited today that stand out as particularly nice or fun? Are there some places that were less nice or fun? If you were given the choice to spend time in any of the rooms or spaces we visited today, which one would you choose?

*Follow-up questions such as "why do you think that is" and "can you tell me more about this" were used when needed

Data was collected on multiple occasions. Group 1 was invited to choose a desired time slot on a date decided by the researchers as part of the invitation. The researchers aimed for groups consisting of two to three children. The first and second author conducted the walking interviews to ensure that all responses were recorded. Participants in group 2 were allowed individual interviews to ensure privacy related to their current health status and to accommodate their hospital appointments. The walking interviews with group 2 participants were performed by the first author. Four of the participants in group 2 had to view a film tour of the OCR as OUH had to temporarily shut down the retreat due to constructions on the hospital site (to be finished in 2028). The stops in the conventional hospital spaces were visited as for the remaining participants in group 2 and participants in group 1. These participants had previously been to the OCR as part of hospitalization and/or treatment.

On average, the interviews lasted 44 minutes (range: 27-58 minutes). Children in group 1 were recruited by the first and second author using personal networks, reaching out to friends, neighbors, and colleagues. Children in group 2 were recruited by the first author and frontline employees at DCAMHH as part of a research collaboration between Inland University of Applied Sciences and OUH.

2.3. Characteristics of the spaces

The OCR is a small cabin (50 m^2) located in natural surroundings near the conventional hospital building at OUS, see figure 2. Today, the OCR is mainly used by hospitalized children, with healthcare professionals in a therapeutic setting, and as a place for patients to spend time with family members outside the conventional hospital buildings. The view from inside the cabin face natural landscapes, and the interior is cladded with wood. The OCR consists of two main rooms (excluding a HC toilet accessed from a separate entrance), one larger room with open space (20 m^2) and one smaller room with a table (5,5 m^2). The interior consists of built-in wooden benches with pillows that can be used for play or relaxation. The lights can be dimmed, and there is a sound system available for use.

Figure 1. The Outdoor care retreat. From left: Façade, family room, therapy room (Photographs by Eli Kindervaag)

Oslo University Hospital was founded in 1826 and the current hospital building is from year 2000. The architectural design derives from modernism and functionalism and can be seen as a typical example of hospital design from the late 20th century. For the purpose of this study, we refer to this design as 'conventional hospital design', which can be described as design that follows an accepted model or tradition and conforming to accepted standards of conduct or taste [42]. The spaces in the conventional hospital wing include a reception area and a therapist's office, see figure 3. The reception area has very high ceilings and windows facing the main entrance/courtyard on one side, and a playground for children on the other side. The seating arrangement is fixed with chairs and sofas with plastic textile covers. There is a reception desk and areas for play activities. The therapist's office includes a desk with PC set up in addition to a sofa/and or two chairs with a small table. It has a curtained window facing a hospital atrium. The therapist is free to decorate the office with toys, books, and other objects.

Figure 2. Conventional hospital wing. From left: Reception area 1, reception area 2, therapist's office (Photographs by Eli Kindervaag)

In qualitative research, the comparison between environments and situations does not rely on a set of similar baseline criteria, but rather on the identification of patterns and variations that are influenced by different contexts. The case of the OCR is a type of extreme case because it is highly distinguishable from conventional hospital designs. Extreme cases are often used to understand the limits of existing theories, concepts and practices [43].

2.4. Analysis

The analysis was guided by Braun and Clarke's [39] six steps for reflexive thematic analysis: familiarization, coding, generating themes, reviewing themes, defining and naming themes, and write-up of results. All authors became familiar with the data material by reading interview transcripts. The data was coded, and themes were produced by the first author. The codes and themes were discussed and revised between the researchers several times before final themes were defined and named. The coding process was inductive, but the construction of themes was more latent and critical. The process aimed at exploring areas of interest related to existing findings while simultaneously remaining open to possible areas of interest that were not necessarily drawn from previous research.

2.5. Ethical considerations

The study followed proposed guidelines and was approved by Norwegian Center of Research Data. Additionally, the project was approved by a local ethics committee at Inland University of Applied Sciences based on the decision to include children under 18 years as participants. Participation was voluntary. Parents of all children were asked to read an informational text about the study and discuss participation with their child. Following this, the parents were asked to provide written consent of participation. Children aged 16 years or older (n = 2) signed separate consent forms in addition to the consent provided by the parent. The children were informed about the project in a suitable language and were assured that they did not have to answer any questions that they felt too sensitive or did not want to elaborate on. Children in group 2 were told to freely express their experiences with their diagnosis if they wanted to, while the researchers simultaneously assured participant that information about their previous or current health status would not be included in any written material. Consent from the hospital was ensured through an ongoing research collaboration between Inland University of Applied Sciences and OUH.

3. Results

3.1. Overarching theme: The space guides behavior mode

An overarching theme was created to reflect how children experienced the conventional hospital design and the design of the OCR and the variations in emotional potential for the different places. The produced findings suggest that variations in design and physical features guides children's experience and lead to different modes of behavior. The main finding is that children experience conventional hospital design as being more restricting than the OCR design, and thus, these became our two main themes.

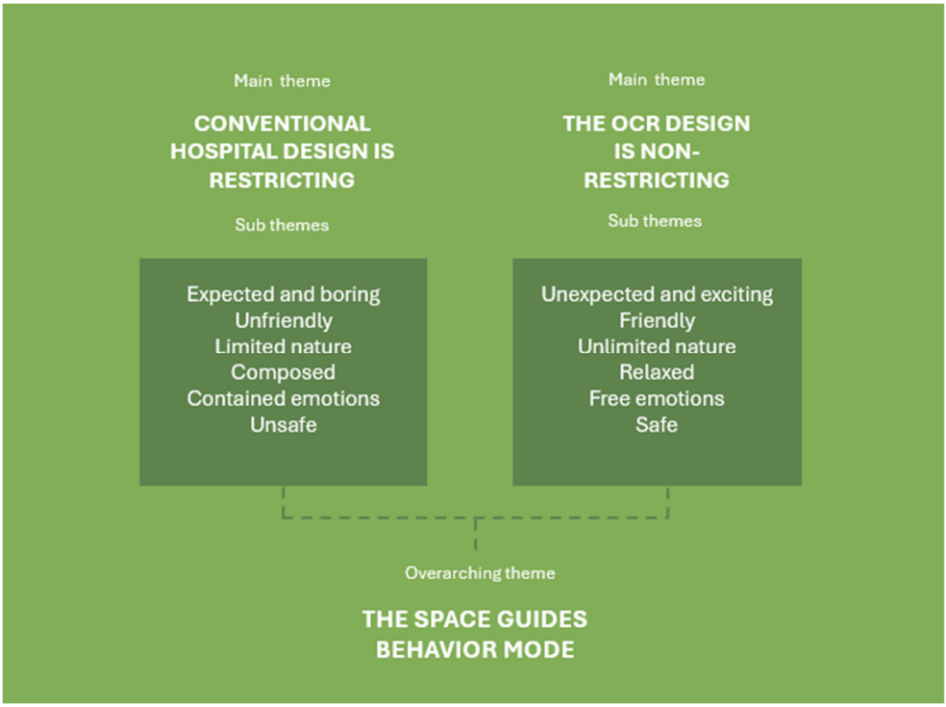

Figure 3. Themes and sub themes

3.2. Main theme: Conventional hospital design is restricting

The first main theme reflects on how children describe the spaces in the conventional hospital wing on how these spaces felt restricting on different levels, both physically and emotionally. Although the children generally enjoyed aspects of these spaces, they mostly attributed their favorable attitudes to the presence of toys and opportunities for play and underlined that the architectural features of the spaces were less interesting. The main theme was divided into (1) expected and boring, (2) unfriendly, (3) limited nature, (4) composed, (5) contained emotions, and (6) unsafe.

3.2.1. Expected and boring

The children continuously described spaces in conventional hospital wings as 'boring', 'basic', 'normal', and 'ok'. Several of the children compared the hospital to other public buildings, such as a church (there is a clock tower visible from outside), school, or airport. Many of the children in group 1 were surprised that hospitalized children must live here for extended periods of time.

It's a bit basic, everything is white. If you removed everything inside here, it would just be white. White, black, and grey. (Child in group 1, 11 years)

3.2.2. Unfriendly

Many of the children described the spaces in the conventional hospital wing as unfriendly, especially related to the scale of reception area (too spacious), the white color on the walls, and the lack of identify based on design and architectural features alone. They underline that the presence of toys and welcome signs helps to create a more welcoming atmosphere. Some of the children expressed how these spaces felt 'formal' and that they felt inclined to quiet, despite the presence of noise. Several children disliked the noise level in the reception area.

There is nothing I really like in here, it's very white. More colors would make it more welcoming, give more character to the space. It would make it more friendly. (Child in group 1, 11 years)

3.2.3. Limited nature

In the conventional hospital wing, the children expressed interest and satisfaction with natural features present in these spaces, such as the water fountain inside the reception (although lacking water), and flowers and plants where present. They explained how natural features made the spaces less boring and sad. Still, the presence of nature related objects and design elements are more sparse and not all spaces offer direct or indirect access to nature. For the therapist's office, one of the children convey:

You feel less locked in when there is a view outside the window, you don't get that here. It would be nice to see some nature, if only a single tree. (Child in group 2, 16 years)

3.2.4. Composed

In the conventional hospital wing, the children felt more cautious and explained that the presence of other people/strangers makes them adjust their behavior to appear calmer and more considerate.

When you go into the hospital, you automatically become more quiet. You talk less and act more quietly. (Child in group 1, 11 years)

The presence of others was mostly discussed in the reception area of the conventional hospital wing. In the therapist's office, they felt more comfortable expressing themselves, but still felt contained as the room was experienced as small and claustrophobic. Many of the children expressed how they would like to be able to move around in the space and make use of different furniture. Thus, they felt contained in the therapist's office that only offer one seating arrangement:

This place should feel more homely. I would be tense if I had my therapeutic sessions in here. I don't like tiny rooms like this, it should rather be used for storage. (Child in group 2, 15 years).

3.2.5. Contained emotions

Many of the children pointed out the need for privacy, especially in coping with negative emotions such as anger, fear, or sadness. Although they experienced some areas in the conventional hospital spaces as allowing such emotions, they generally considered OCR

as suitable to express a range of emotions. For the reception area, one of the children convey:

If you feel like crying and there are a lot of people around, they might see it and start talking about it. I think it would be better to be alone somewhere if I was sad. (Child in group 1, 11 years)

3.2.6. Unsafe

Several children describe a sense of feeling unsafe in the conventional hospital spaces, although many find it difficult to describe. Still, they reflect on how the presence of strangers can feel both safe and unsafe, and how the large size of the buildings with many different rooms and equipment makes the place feel unfamiliar and less safe. The role of safety was more frequently discussed by children in group 2.

I didn't feel safe being at the hospital for long periods of time, even though I knew I was being taken care of. I somehow felt safe with the illness, but never with being there (Child in group 2, 15 years)

3.3. Main theme: The OCR design is non-restricting

The second main theme reflects the children's experience of the OCR as a space that feels less restricting than the conventional hospital spaces, and where the emotional potential of the space is experienced differently. All children report that the OCR is their favorite space when asked to choose between the visited locations. This theme was divided into (1) unexpected and exciting, (2) friendly, (3) unlimited nature, (4) relaxed, (5) free emotions, and (6) safe.

3.3.1. Unexpected and exciting

All children expressed an experience of the OCR as somewhere unique and exciting. Especially children with no previous experience with the OCR were taken with the physical features of the retreat. They expressed how the building looked nothing like a hospital and was more reminiscent of a cabin or a sauna. They used words such as 'fancy', 'modern', and 'cool' to describe the building, and expressed satisfaction with the space as somewhere fun and comfortable to spend time.

It's super cool here! It's the coolest house I've ever been in. The other rooms we were in, were kind of normal, but this is special. (Child in group 1, 11 years)

3.3.2. Friendly

The children described the OCR as small and cozy, much more so than spaces in the conventional hospital wing, while still feeling like an open space. They also expressed how the building allows them to choose whether to spend time alone or with others, and how it works for both situations. Some of the children mentioned that the colors and playfulness of the OCR made it friendly and fun, and how they felt more like home in this space compared to the conventional hospital wing.

It's really cozy that it's made of wood, you get more of a homely vibe, not hospital-like at all. I like all the nooks, so you can be alone if you want to. (Child in group 1, 11 years)

3.3.3. Unlimited nature

Similarly to the conventional hospital spaces, the children expressed a favorable attitude towards everything nature related inside and outside the OCR and highlighted how nature access makes a place feel warm, familiar, and homelike. They
were highly taken with the green views surrounding the OCR on how these views are accessible from both inside and outside the building, somehow being unlimited to them. For the outside areas, they expressed a wish to use this place for activities such as fishing, making a bonfire, and playing in the trees and the nearby stream.

Inside the other hospital, everything is very large and white. It's cozier in here [the OCR], and it's very open towards nature outside. I feel very at home when I'm in nature. (Child in group 1, 10 years)

3.3.4. Relaxed

The children felt more relaxed in the OCR than in the conventional hospital wing, and attributed this to the 'pretty' design, warm color palette, the presence of pillows and textiles, access to nature, the absence of noise, and no visual reminders of being in a hospital. They explained how they could be themselves in the OCR.

It really feels like a little cabin, and when you're at a cabin, you're more relaxed. You don't think about the same things that you do when you're in the city. You get to relax, there is less noise, you can just be yourself. Nothing is stressful here. (Child in group 2, 16 years)

3.3.5. Free emotions

The children explained how the OCR allowed more free expression of emotions than in the conventional hospital wing. In the OCR, they described how they could move freely around in the space based on how they would feel, including feelings of sadness, fear, anger, and happiness. Some even suggested that the physical features of the OCR made them happy and excited, whereas the spaces in the conventional hospital wing made them feel 'dull' or bored. The children explained how they would have to be more considerate of others in the conventional hospital wing, and that the privacy the OCR offers allows them to freely express themselves without having to think about how others would react to their emotions or behaviors.

In the other hospital spaces, there might be other people who wants to relax or want things to be quiet. If that happens, you can go outside here and makes as much noise as you'd like. (Child in group 1, 11 years)

3.3.6. Safe

The OCR is generally described as feeling more safe than the conventional hospital spaces. Some children assign this to the familiarity of the place, with natural materials, pillows, and no unfamiliar equipment.

I think the materials and the colors make me feel more safe in here [the OCR]. When you get away from everything that is white and plastic, with more daylight. I really like the big windows facing the forest. (Child in group 2, 15 years)

4. Discussion

The present study explores children's experience of two locations at a Norwegian hospital that differ in their architectural design. The findings from this study demonstrate that when children are asked, they seem to prefer some environments over others, especially spaces that include designs that mimic nature, are friendly, fun, and private. Importantly, this study shows that children experience favorable attitudes toward spaces in conventional hospital buildings, but mostly due to interior features such as the presence of toys, indoor plants, and colorful décor. Moreover, study findings suggest that changes in the physical environment seem to trigger different cognitive schemas in the child, that subsequently lead to different emotional responses and modes of behavior.

4.1. Children's experience of hospital environments

Several findings from the study are in line with existing research. Supporting research from Birch and colleagues [2], the children expressed that unfamiliar spaces led to feelings of fear, anxiety, and stress. Additionally, the children continuously communicated satisfaction with the presence of sensory objects. This included their joy for everything related to fun, play, toys, and distraction, in addition to artwork, textiles, beautiful views, and access to nature, and their negative views of features they deemed 'boring' or 'normal'. The children frequently expressed satisfaction with everything nature-related, including objects inside the conventional hospital building that resembled nature (water fountain, plants, flowers, art of nature), and outside the building, including the outside areas of the OCR. This reflects previous research that has found nature elements to improve satisfaction with a hospital space for children [12]. Similar suggestions can be made about noise [2, 12, 44] and lack of privacy [3, 16, 17]. The children expressed satisfaction with more quiet and cozy areas where they could spend time alone or with friends or family members.

4.2. Activation of cognitive schemas and modes of behavior

The findings from this study suggest that children hold a cognitive schema of hospitals as somewhere white, unfriendly, public space where people are sick. This is reflected in how they frequently refer to the hospital as 'a place to for sick people' and that they did not experience that 'hospital feeling' in the OCR. Moreover, they refer to familiar and soft features, such as artwork, plants, and toys, as something unexpected in a hospital context. The OCR seemed to activate a cognitive schema related to familiar and leisurely environments, such a cabin or home.

Study findings suggest that the activation of different cognitive schemas triggers different emotional responses, thus leading to increased or decreased need for emotion

regulation strategies depending on the physical space. This is related to initiation of different behavioral modes. In the conventional hospital spaces, the children expressed how they felt more inclined to be quiet and composed, whereas in the OCR they felt more relaxed and freer to express themselves and various emotions. As Gross [29] describes, having to regulate negative emotions due to situational circumstances can lead to emotion suppression rather than expression, which could influence long term negative consequences of hospitalization. Moreover, given the four child modes of behavior described by Young and colleagues [25], the insecure and restricted mode of behavior produced for this study, can be compared to the vulnerable child mode, the impulsive child mode, and the angry child mode. This study suggests that the secure and free behaviors associated with features in the OCR ensures that the child's emotional needs are met, possibly related to Young and colleague's [25] happy child mode.

The findings also support research from environmental psychology on place attachment and favorite places. Most children experienced the OCR as unexpected but still reminiscent of familiar places they held positive attitudes towards, such as nature, a home, or a cabin. Thus, their cognitive schemas of these places as somewhere familiar, where they have good memories, feel belonging to, and can control, suggests that the OCR is a suitable space for enhancing self-identity and self-esteem [30, 32]. We therefore suggest that when a child spends time in the OCR, as compared to spaces in the conventional hospital wing, they will gain a sense of familiarity and belonging that is appraised as a secure base to freely express themselves [34, 37], which in turn can lead to positive memories of the hospitalization experience with subsequent beneficial outcomes on mental well-being and health.

4.3. Strengths, limitations, and transferability

One strength of the present study is the inclusion of children as participants, as most research on children's experiences of hospital environments is based on reports by caregivers or healthcare professionals. Moreover, even fewer studies include children with hospitalization experience. An important strength of the study is the ability to improve practice [45]. If findings are implemented in current or future healthcare facilities, this can ensure increased patient satisfaction with the physical environments at hospitals for children and their families.

One limitation of the present study is the challenge of comparing different and dynamic physical environments. It was impossible to control the presence of toys, noise levels, and the number of strangers (e.g. other patients) present during data collection, especially in the reception and hallway areas of the conventional hospital space. Nonetheless, the children were exposed to a naturalistic visit to a hospital and this limitation is not regarded as a major challenge within the chosen qualitative methodology [46].

A second limitation includes a possible favorable attitude towards the OCR by the researchers. All researchers are familiar with the positive association between nature, high quality architectural features (e.g. materials, privacy, control), and health outcomes. While our intention was to remain explorative and open during the research process, it is possible that our background influenced the analytic process and led to favorable results for the OCR. Importantly, we expected that children would express more negative views of the conventional hospital spaces than reported and have attempted to convey the findings accordingly.

This research is a unique study of children's experiences of different physical environments at hospitals in a Norwegian context. The intent is to reach resonance with an audience and allow interested readers to transfer the findings to situations they deem similar in their own work [45]. This could include health care workers at a hospital or in a health care setting, or as part of developing health related design projects for architects.

4.4. Conclusion

This study proposes that different physical environments at hospitals elicit different emotional responses and behavioral modes based on the experience of children and adolescents under the age of eighteen. Study findings suggest that designing healthcare facilities that are unexpected and exciting, friendly and intimate, and has access to nature, will ensure secure children that feel free to express themselves and thus more available and robust in dealing with negative emotions commonly associated with hospitalization. Our aim for this study is to inspire architects and hospital management to consider children's experiences of hospital environments in the design of future healthcare facilities.

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