

Design considerations for play experience in children's hospital: from perspectives of child inpatients, parents, nurses and hospital service experts

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Play is an essential element of cognitive, physical, social and emotional development of children. The space of hospital takes away play from children. When children face to unfamiliar environment, they act with specific strategies in order to control with own situation: they do things to relax such as taking a walk, watching television, they make drawing to control their emotion, or they fill surrounding with personal and recognizable things to feel like a home. The goal of the study expands play experience in the hospital environment to create play experience for young inpatients regarding child development. This study conducted to total three sessions; expert interview with child hospital designer, focus group interview with guardian, and generative session with guardian and child. The results of this study figured out factors of play in child hospital in terms of child-patient, guardians, and experts. Based on these results, this study drew out design consideration which aids child development through play in child's hospital.

Keywords: *Children's hospital; Play; Cognitive development; Emotion; Healthcare*

1 Introduction

Play is an essential element of cognitive, physical, social and emotional development of children (Hayward, Rothenberg, & Beasley, 1974; Beltzig, 1998; Veitch, Bagley, Ball, & Salmon, 2006; Grillmeier, 2015). Children are offered thousands of delight of free play, so they can play, explore and interact with nature and playground without restriction or supervision (White & Stoecklin, 1998). In there, they learn how to solve problems by trial and error and grow stronger. In addition, they get to know how to cooperate with others for coping with difficulties and naturally absorb how to express and control their emotion in a community through play. However, such freedom of play is radically constrained in case a child is hospitalized in inpatient wards simply because care (her illness could get worse) and stability (she can hardly move due to her illness) are required. Losing playing in the children's hospital, staying at a ward can be a poignant experience for children (Verschoren, Annemans, Van Steenwinkel, & Heylighen, 2015). In particular, emotionally children inpatients suffer from considerable concerns and fears during hospitalization because of separation from family and friends in a limited space (Haiat, Bar-Mor, & Shochat, 2003; Coyne, 2006). In addition, children experience negative effects of hospitalization on the

children development (SilavUtkan, 2012). However, play can help children development softening the negative emotions at the hospital (Aziz & Said, 2012; Grillmeier, 2015). There have been studies on making a children’s hospital playful place in order to reduce children’s concern as well as to help children development in a hospital environment (D’Antonio, 1984; Haiat et al., 2003). For example, the case of Yael, aged 10 years, was hospitalized to care burns. She visited the white room which made it possible for her to handle the pain, situation, and the odor of burn through play (Haiat et al., 2003). The example of American hospital, children’s play is not a simple recreational activities supervised by volunteers but therapeutic programs implemented by professionals(Pruitt, 2016).

In addition, having a child hospitalized is not satisfying not only to children inpatients but also to caregivers because hospital environment is more difficult than their home in terms of hygiene, and treatments(Favara-Scacco, Smirne, Schilirò, & Di Cataldo, 2001; Haiat et al., 2003; Commodari, 2010). Even for those who like dynamic and physical play, inpatient wards in the children’s hospital spatially provide a huge constrain. Even though caregivers already knew of the importance of play with their child(Miller et al., 2016), they do not make their child play freely at hospital which has limited play or space. As a result, children inpatients can only do limited activities such as a puzzle game or drawing in the ward.

1.1 Role of play and necessity of play

The verb of ‘play’ is about not a serious or practical but an engaging in the activity for enjoyment and recreation in the dictionary. However, this description is the general definition.

Play has five essential characteristics which are intrinsically motivated, freely chosen by participants, pleasurable, nonliteral, and actively engaged in by the player (Rubin, Fein, Vandenberg, Mussen, & Hetherington, 1983). First, in terms of characteristic of intrinsically motivated, play gives satisfaction itself. Second, children accept activities as a work without chosen, but they think same activities as play when they can choose it (King, 1979). Third, the most typical behavioral criterion is positive affect for observation of child play in terms of the character of pleasurable (Jenvey & Jenvey, 2002). Fourth, play is changeable according to the interest in the characteristic of nonliteral. Lastly, the child is involved not passively but physically, psychologically, or both what is doing so as to actively engaged in by the player.

Through summarizing play based on play theory, play consists of physical play, emotional play, social play, and mental health play (Metin, 2003) (Table 1). Diverse studies present the necessity of play and function of play.

Table 1. Theories in relation to play (Metin, 2003)

Theories	Reasons for play	Play benefits
Surplus Energy H. Spencer	Discharging the natural energy of the body	Physical
Renewal of Energy G.T.W. Patrick	Avoiding boredom while the natural motor functions of the body are restored	Physical
Recapitulation G.S. Hall	Reliving periods in the evolutionary history of the human species	Physical
Practice for Adulthood K. Groos	Developing skills and knowledge necessary for functioning as an adult	Physical, Mental health(cognitive)

Psychoanalytic S. Freud, A. Freud , E. Erikson	Reducing anxiety by giving a child a sense of control over the world and an acceptable way to express forbidden impulses	Emotional, social
Cognitive – Developmental J. Bruner, J. Piaget B. Sutton-Smith	Facilitating general cognitive development Consolidating learning that has already taken place while allowing for the possibility of new learning in a relaxed atmosphere	Mental health(cognitive), Social
Arousal Modulation D.E. Berlyne, G. Fein H. Ellis	Keeping the body at an optimal state of arousal Relieving boredom Reducing uncertainty	Emotional, physical
Neuropsychological O. Weininger, D. Fitzgerald	Integrating the functioning of the right and left cerebral hemispheres	Mental health(cognitive)

1.2 Historical child development and definition of child development

In this study, children are under 13 years in psychology, that is, we call childhood before adolescence. Especially, it is an importance to develop children's physical element as well as children's psychological element dependent on play activities (Bruner, 1972; Kohlberg, 1968). However, the period of children has quiet complex categorizations. Child development theories focus on explaining how children grow and change in childhood in terms of various aspects of development including physical, cognitive, emotional, and social growth. Throughout literature, this study defined the child development for under the 13 years old children.

In physicality development, it is related to a child's ability to perform tasks such as their motor skills or using their bodies (Piaget, 2013). Child development was consisted of four stages; Infant, Toddler, Pre-schooler, and School-aged child. During the first few weeks and months, child of infant stage acts reflexive or involuntary in nature. In detail, child makes sudden loud sound, changes position, and grabs object in hands or feet. During the ages of one month and one year, the child is able to hold head up on object, sit without support, creep or crawl, and walk (Hughes, 2009). Toddler stage is between one and three years of age to develop physical growth and motor skill slowly to expect to see the tremendous intellectual, social and emotional changes (Hughes, 2009). Children become pre-schooler during three to five years of age to focus on cognitive development (Piaget, 2013). In school-aged child, between five and 12 years old, child feels confident in the ability to meet the challenges. Child experiences in solving problems independently, being creative and getting results for efforts (Hughes, 2009).

In cognitive behavior development, Piaget's theory consists of five stages; Sensitive motor stage (0-2), Preoperational stage (2-7), Concrete operational stage (7-11), Formal operational stage (12-) (Piaget, 1964). Child expresses response to sensitive stimuli in Sensitive motor stage. Child increases understanding symbol or representation about the object, but the child is impossible to think logically in Preoperational stage. The child acquires cognitive operation to understand the relationship between objects in Concrete operation stage. In Formal operation stage, the child is possible to ratiocinate symbolic, so child utilizes abstract concept to think logically.

In emotional development, Erikson's theory of social psychoanalysis consists of six stages; Fundamental trust vs distrust (0-1), Independence vs shame or skepticism (1-3), Autonomy vs guilty (3-5), Assiduousness vs inferiority (6-12), Identity vs role confusion (13-18), Affinity

vs isolation (20) (Erikson, 1993). Children achieve their activity to feel trust, independence, autonomy, assiduousness, identity, and affinity in each stage, but they fail it to experience distrust, shame, guilt, inferiority, role confusion, isolation.

In social behavior development, the theory of animal behavioristics emphasizes nature role in child development with Lorenz' theory of carved seal and Bowlby's theory of attachment. Lorenz theory describes that child period is exposed to specific context to form the attachment of specific context. It can deeply influence social behavior. Bowlby's attachment theory consists of four stages; Reckless social response stage (0-3 months), Discriminative social response stage (3-6 months), Active approach and contact-seeking stage (6 months - 3), Goal modified companion stage (3-childhood end) (Bowlby, 2008).

Diverse child development theories focus on children's age level. To improve child development, it is important to support play for the child in terms of physical, cognitive, emotional, and social perspective. First, Physicality development is an indispensable factor in children's play (Bee & Boyd, 2012; Broto, Ockrassa, Krauel, & Noden, 2010; Kotnik, 2017). This play type contains motor skills, physical stamina, and confidence while promoting fitness and health. The definition of Play with physicality is developing a muscle through physical activity. Next, Play with sociality refers to the process that children learn to interact with others (Broto et al., 2010; Kotnik, 2017). Through this play type, children are able to understand game rules, sharing, friendships, and other relationship. Children master teamwork as well as competition for social interaction and communication skills. Third, Play is associated with creativity for children development (Broto et al., 2010; Russ, Robins, & Christiano, 1999). Through this play type, children acquire creative thinking ability and power of imagination through the play. Lastly, children who contact with natural environment tend to be more active and that supports a positive mental health (Brussoni et al., 2015; Lester, Maudsley, & England, 2007). Children do this play that is associated with language, perception, memory, problem-solving and thinking. The definition of play with mental-health is that children learn the sensory skill and improve knowledge for play.

In this study, we consider the basic child development for child in terms of physicality, cognition, emotion, and social behavior. In order that the four developments are important to child growths, this study consider exploring them in child's play.

1.3 Lack of play at children's hospital

In the 18th century, hospital architecture contributed to the patient's well-being, so this idea has been influencing health care facility design (Wagenaar, 2006). Also, the concept of hospital studies is attracted renewed attention such as healing environment (Dijkstra, 2009). However, many studies that would follow healing environment perception, few focus on child patients (Verschoren et al., 2015). During hospitalization, child patients suffer from fears and concerns because of being separated from family and their friends, staying in an unknown and unpleasant environment, undergoing treatment, and losing their self-determination (Adams, 1976; Coyne, 2006).

According to another the study, hospitalization is a variety of negative effects such as pain, fatigue, anxiety and, etc. on the development of children in the hospital environment (SilavUtkan, 2012). Children's hospital is designed to protect children's physical and psychological health (SilavUtkan, 2012). The author insists that child-space interaction is important in terms of children's hospital design based on children's requirement (physical and psychological) (SilavUtkan, 2012). Particularly, children who have a serious disability

have a high risk of emotional problems, behaviour problems, and reduced the ability of cognitive development(Tallon, Kendall, & Snider, 2015).

To improve hospitalization and child development, children can play diverse activities in order to reduce fear as well as becoming confident in playroom or play area, so caregiver can visit the playroom or play area frequently with the child to enjoy activities together (“Your child in hospital: The importance of play,” 2013). About the role of play in hospitalization, children in the therapeutic play condition proved a significant reduction in hospital fears (Rae, Worchel, Upchurch, Sanner, & Daniel, 1989). Consequentially, play is the most powerful and effective tools so as to reduce tension, anger, frustration, conflict, and anxiety at the hospital (Haiat, Bar-Mor, & Shochat, 2003)

This study aims to provide design considerations in creating play experience in the children’s hospital. The two research questions are formulated: 1) How can play experience be created in the children’s hospital in terms of child development. 2) What concerns and wishes of stakeholders exist in the children’s hospital regarding to play experience?

2 Methods

In order to figure out what needs and wishes about play stakeholders in the children’s hospital have, three methods were conducted, expert interview, FGI, and generative workshop. First, through expert interview, this study had to figure out knowledge of child inpatients and understand situation of child hospital. Second, this study considered parents and nurses as secondary member of child hospital to be conducted to FGI session. Lastly, this study had a generative workshop for children because it is easy for children to embody their wishes based on experience rather than interview.

2.1 Expert interview

2.1.1 Experts

We recruited to experts who worked in service design team from tertiary care hospital at Seoul and secondary care hospital at Busan. Three experts who worked at hospital service team understood the design process to develop hospital space (see their detailed background in Table 2). Experts who were from diverse backgrounds had working experience average six years. They could understand not only design thinking but also medical knowledge in order to answer the design consideration for child inpatients.

Table 2. Experts profiles in the expert interview

Participant	Gender	Age	Backgrounds	Profession or expertise	Working place
A	Female	36	Designer	Hospital design management	Hospital in Busan
B	Female	38	Nurse	Hospital service design management	Hospital in Seoul
C	Female	28	Designer	Hospital place design management	Hospital in Seoul

2.1.2 Materials

The research conducted the semi-structured interview with experts. The questions of the expert interview consisted of three part. First, interviewees were asked features of child hospital such as target of child hospital, the percentage of each age group, the ration of infection inpatient and non-infection inpatient, and etc. Next, we asked experts of children’s play in the hospital and current condition as below:

- Do the children in the hospital have lack of activity?
- If so, how do they solve their activity?
- What do children have difficulties related to play at the hospital?
- How do children express their dissatisfaction at the hospital and what do they want at the hospital?
- What does your hospital serve to release boring for child inpatients are current services or spaces satisfied to child inpatients?
- Lastly, they mentioned the effect of play for child inpatients and the solution of the current condition.

2.1.3 Procedure

The expert interviews were conducted to the children's hospitals which were located to the woman and child hospital in Busan, and the national hospital in Seoul. In order to explore an expert's opinion about the play in hospital, respondents were interviewed for one hour (Figure 1). We recorded their voice during interview session. First of all, we distributed interview question. Next, the expert described what they did in hospital as design perspective for 10 minutes. After then, they answered main problem in hospital for 10 minutes. We asked the solution for child inpatients in hospital to experts for 20 minutes. Then, they answered future play design for child inpatients for 20 minutes.



Figure 1. Experts read the interview questionnaires in the interview session.

2.2 Focus group interview

2.2.1 Participants

We recruited six nurses of the child's hospital from Busan and five mothers from Ulsan through recruit advertisement and social networking. Nurse team were woman who were between 28 to 48 years old and from the hospital for woman and child in Busan. Five mothers who were between 30 to 56 years old had the experience to care for their child in the hospital within one month.

2.2.2 Material

The main goal of the FGI was to obtain user needs about hospital play space. The session of collage was adopted as thinking for child play space in hospital context based on caregiver position. For the collage making, a A3 paper with a basic play room layout was designed to help the participants express their wishes in the space (Figure 2). We also provided pencils and sketch tools in order to express participants' idea freely on the paper.

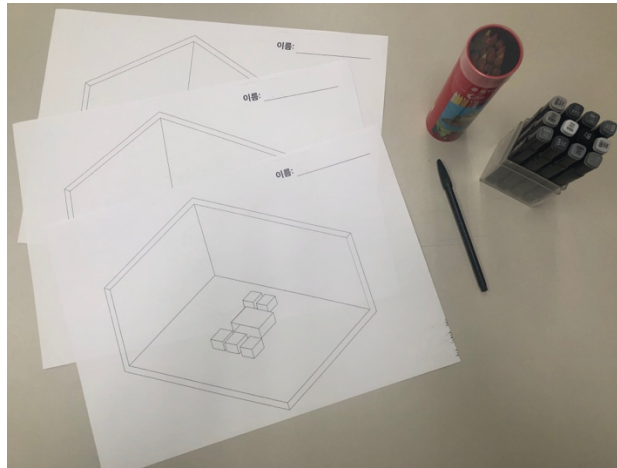


Figure 2. A paper with a play room layout used in the session of the collage making and sketch tools

2.2.3 Procedure

The FGI was conducted at a room in hospital and in cafe. Throughout ice breaking, participants introduced themselves and shared hospitalization for 10 min. We asked what you want to design play room in hospital. To figure out the needs of the playroom in the hospital, participants drew or wrote what they designed for children during 20 min with pencil or drawing tools. Each team discussed the questions which were about what they want things at playroom and why they placed something at playroom on their drawing for 30 min (Figure 3).

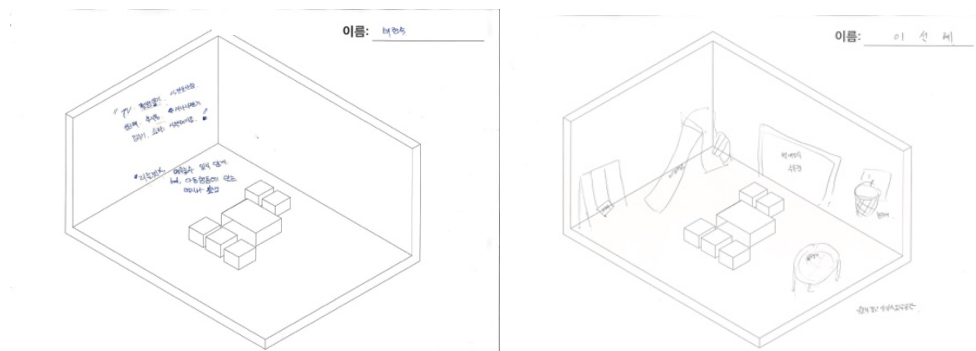


Figure 3. Scenes of the focus group interview (above) and examples of collages of play room (below)

2.3 Generative workshop

2.3.1 Participants

Throughout mother's internet community in Ulsan, we recruited three children (one boy and two girls) and their mothers in this workshop. The average age of the children was seven years old. All of them had an experience to have been hospitalized for at least a week duration. The participants involved in the research had hospitalized in child hospital for one week. Also, they experienced hospitalization within 6 months before the time of the workshop.

2.3.2 Materials

The images of hospital were utilized to evoke experience of hospitalization. In order to express wishes for children and make detailed form of play, we prepared diverse tinkering materials such as paper, clay, sticks, plastic bowls, woolen yarn, and so on. Before the tinkering session, participants evoked their hospitalization experience through sensitizing images which were projected on the wall. In the session the following questions were answered: What do you have negative experience during hospitalization, What and why do you design the play in hospital? and How to develop others play?



Figure 4. Examples of sensitizing images (upper) and materials provided for tinkering for the workshop

2.3.3 Procedure

This workshop was conducted in a home-like laboratory for 2 hours. Before the session, we took the nerves of child to do ice breaking and to talk about the memory of hospitalization. It consisted of two steps: one was sensitizing experience in hospitalization throughout hospital images, and the other was creating play space to use materials (Figure 5). Next, after watching hospital images, the children shared their negative experience of hospitalization

with others for 30 minutes. Next, they imaged to design play in hospital context for 50 minutes with assistances teacher because of issue of safety and focusing on hospital context. Assistance teacher helped child evoke thinking for hospital. Lastly, they presented and discussed their play for 40 minutes (Figure 5).



Figure 5. A scene of the workshop (above) and the outcomes generated from the workshop (below)

2.4 Data analysis

To figure out the result from interview data and generative sessions, the participants' data were transcribed into text. We used described coding as first coding frame because meaning sentences were cut from experts, nurses, parents, and children. All coding processes were conducted to three researchers, who were a PhD student and two graduate students together, in order to improve validity of coding and analysis. First of all, throughout affinity diagram on frequency percentile, the data of experts's interview were arranged to describe the reason of lack of play space and consideration of design in child hospital. Also, we analyzed FGI data from nurses and parents in terms of needs for child play room. Lastly, this study figured out child's wishes of play to analysis affinity diagram.

3 Results

3.1 Current play experience in the children's hospital

This study investigated the reason of lack of play space through expert interview. Figure 6 shows the frequency percentile of reasons about the cause of lack of play space in hospital. The infection was the most frequently mentioned as associated reason of lack of play space in child hospital (46%). Because child inpatients have weak immune system, experts think

that child expose virus from others in play room. Physical safety (21%), Priority of healing (16%), and Lack of staff for play space (16%) were followed in this figure. In the hospital, experts mentioned that the removal of play space prevented safety accident. The characteristic of hospital, there was not playground, so most service or facilities focused on healing for child. In management perspective, it was hard to care play space for child because of limited of staff numbers.

No-play space in Child hospital

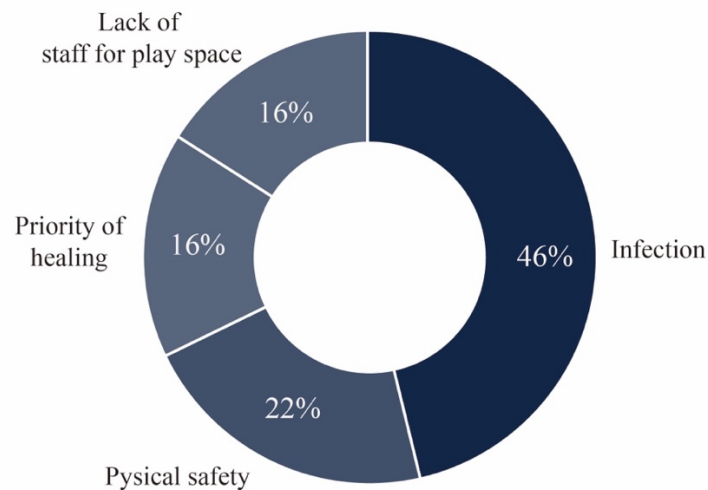


Figure 6. The reasons why play space has not been considered in children's hospital

3.2 Considerations for play experience in children's hospital

Through expert interview, this study figured out consideration of design of play at the child hospital. Figure 7 shows the frequency percentile of reasons about the design consideration of play in hospital. The interactive play was the most frequently mentioned (23%) in order to reduce direct contact to others and to utilize interactive technology for play. Next, the emotional comfort (21%) and the therapy with play (20%) were followed. The emotional comfort was related to character design or colourful design to reduce fear of hospital for child. The 10 percentage was mentioned to the Outdoor play. For example, child inpatients could experience an exploration of nature. The child development (9%), the physical safety (8%), and etc (9%) were followed in this figure. Play design in hospital was considered for lack of part of child development. Also, because diverse play activities accompanied physical activity, play has to prevent safety accident.

Recommandation Play in Child hospital

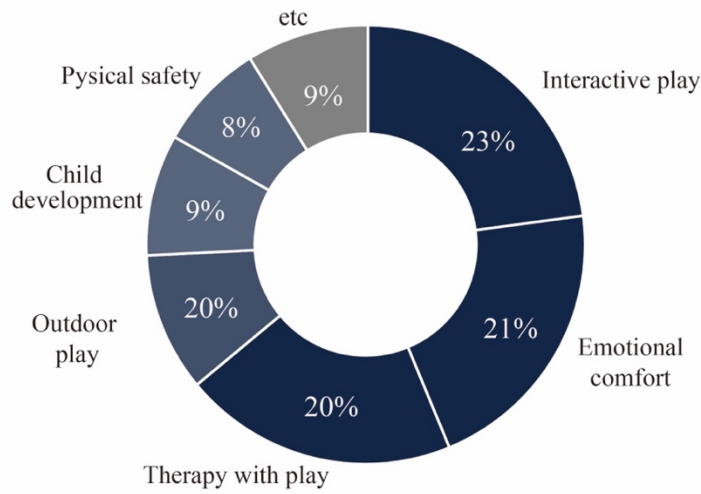


Figure 7. Factors to be considered in designing for play in children’s hospital from experts’ perspective

3.3 Guardian needs for child in hospital

To verify the difference between nurse and parent, the results of FGI were coded for qualitative analysis in terms of parents’ and nurse’s perception. Figure 8 presented important needs for child in play space. First, about the perspective of parents, the component of fun and hygiene are important as 37.5 % in this figure. Parents needed spending time for the child to get rid of boredom in hospital. Also, parents needed clean play space because this place was shared space with other child inpatients. Next, parents mentioned the needs of physical safety in play room because they did not want to hurt their child during play. In nurses’ perception, physical safety for child was the most significant needs among others in playroom. Hygiene (28.6%), space (21.4%), and convenience for service (14.3%) were presented to figure. In nurses’ perception, hygiene was related to prevention of infection from virus. Space was related to interior. For example, nurse wanted to change space according to purpose such as education, play, and etc. Convenience was related to service for parents to serve diverse facilities such as cosy sofa, snack bending machine and etc.

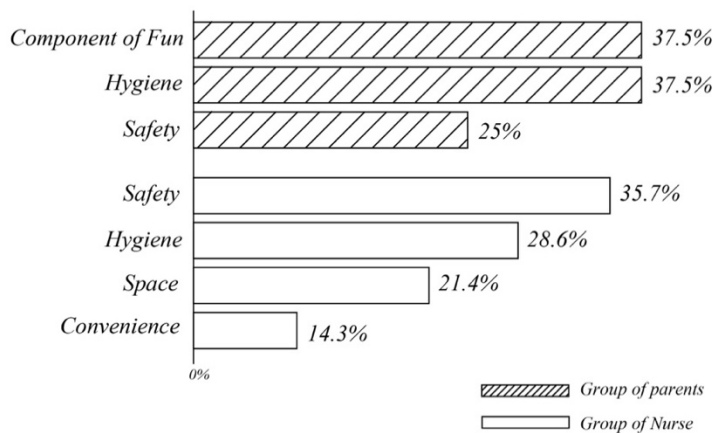


Figure 8. The needs for play experience in children’s hospital from parents and nurses perspectives

3.4 Child perception of play in hospital & Guardians perception of play in hospital

Figure 9 presents the frequency percentile of play wishes associated with child in the hospital context. Among the results of play in hospital, the most frequently answered play was sensory and it occupied 17 percentage. Next, Physical (15%), creative (13%), interactive (12 %), exploratory (10%), free for monitoring (10%), Social (5%), Relaxation (5%), and Safety (6%) were followed. The table 3 shows the children’s quotes which describe the example of participant’s wishes.

Table 3. The example of participants’ quotes

The results	Quotes
Sensory	A: “I want to touch soft for play...” B: “It is good at music song during the play because it is very glad to me.”
Physical	C: “I make the climbing slide, so it is possible to slide at high site.”
Creative	B: “I like drawing. When I am boring, I am happy to draw....”
Interactive	B: “I make big wall in order to draw electronic pen on the white wall...”
Exploratory	C: “I design car to tour the playground with friends....”
Free for monitoring	A: “There are no guardians. They just stay rest room to read book...”
Physical safety	A: “Every play should be safe...” B: “This sliding is high, but it has safe bar because I do not want to get hurt during play”

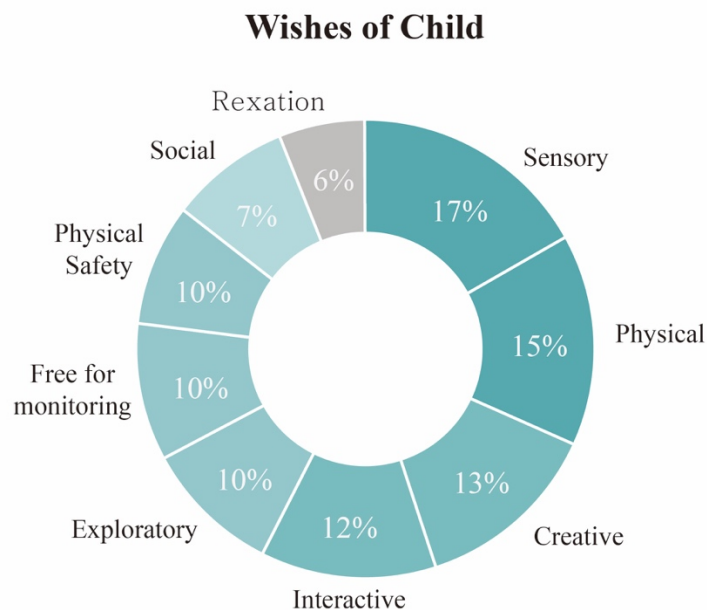


Figure 9. The wishes for play experience in children’s hospital from child inpatients’ perspective

4 Discussion

Based on the results, design considerations for play experience in children’s hospital were derived. The design considerations consisted of five categories: interactive technology, motivation, fun-therapy, social-physical play, and free from infection.

4.1 Interactive technology

According to the results of this study, interactive technology stands out play for child. It indicates that the interaction between person and product arouse diverse opportunities of play. In child perspective, child prefer to play interactive wall such as game, painting, and etc. in order to play with creativity. Experts and guardians would like to utilize interactive projection for the child as playing with creativity. To provide interactive technology, it would help playing with creativity for the child. Especially, interactive play help to develop cognitive development for child at hospital context (Pykhtina et al., 2012). For example, there are interactive screen which children can play diverse activities thorough at the child's hospital in England.

4.2 Motivation

To design the play in hospital, motivation is possible to give the child inpatient fascinated play. For instance, Hospitals have a different interior like the concept of space flight in order to reduce the serious atmosphere for the child. Also, exploration stimulates child's curiosity which observes the intriguing things. It indicates that the child improves confidence throughout achieving the mission (Perry, Hogan, & Marlin, 2000). Throughout motivation in hospital, the child would be satisfied with playing with emotion development so as to relax hospital environment.

4.3 Fun-therapy

Therapy is scared course to children even though it is simple such as measuring temperature and having a shot. However, children would recognize a fun-therapy, which combines play and therapy, as a part of the play. For example, child inpatients refuse walking around an aisle of the hospital as a recovering, but they like to follow the colourful line of the floor. Through fun, emotional, social, and cognitive development are accelerated by the fun of play (Perry et al., 2000).

4.4 Social-physical play

In hospital context, the child spends their time during healing without play. Despite the main function of hospital is recovering of the body, experts of hospital mention the importance of playing during healing. Even though children experience insufficient child development in terms of physical and social development in hospital, guardians and experts of hospital want to give education for child development their child. To supply play with physicality and sociality, the play has to be designed by combining physicality and sociality. Particularly, it is important to play about social-physical for the older age child group (Smyth & Anderson, 2000). Because, the hospital has limited composition of space, it does not set a limit on inner space. The play space in hospital is extended to roof top park, which provide diverse opportunities. In the hospital, which has diverse space, it plays an important role in expanding play place for physicality and sociality of the child.

4.5 Free from infection

Infection is considered as not ignoring issue of play in the hospital. According to the position of guardian and experts, infection has not to occur in play space. Isolation of space is not a solution for child. It has to be easy to keep hygiene the play space as well as be possible to play indirectly connect for children as playing big block which makes children's hiding place. For instant, play equipment could be made of anti-bacterial material to protect infection.

5 Conclusions

The study aimed to figure out design considerations in creating play experience for child inpatients at hospital. Involving multiple stakeholders who were child inpatients, nurse and parents related to the study, five design considerations were derived from designing the playroom in the child hospital. The first consideration is 'Interactive technology' which is able to utilize interior products so that child inpatients can play diverse activities. The second is 'Motivation' which stimulates the curiosity of child inpatients in order to transform the serious circumstance of the hospital into a space experiencing positive emotion. The third, 'Fun-therapy' which is derived from the participation of child seems that child inpatients recognize the procedure of clinic as the experience of play. For example, child could explore spaceship during using therapy machine in order to experience fun. The fourth is 'Social-physical play' which provides to combine the physical development with the social development in such limited space so as to contribute to childhood development. Even though hospital has limited space in terms of physicality, child inpatients might want to experience with other age groups throughout new play experience. Lastly, it is 'Free from infection' that prevents child inpatients from infection of disease during play experience.

This study showed the design considerations for child inpatients in order to provide child inpatient with play experience. In other words, the play design consideration will be delivered to solve children wishes within the context in the hospital. Child inpatient could be satisfied during hospitalization through play as well as child development. Also, the other implication of this study is to understand diverse user experience where play in hospital to evoke children inpatients' and guardians' physical well-being as well as emotional it.

Although this study provides design implications for play experience in children's hospital, it would be risky to generalize the findings considering some limitations of the study. First, the study was conducted with a small size of samples. Second, the focus of the study was only on children having experiences of short-term hospitalization. Considering there are also child inpatients who have to stay for long term period, the findings would not be applicable for the group of children. Therefore, follow-up studies are supposed to be designed in a way to take the limitations into consideration.

Overall, the findings are expected to make a meaningful contribution to design for play experience in children's hospital because the design considerations were derived from diverse perspectives of stakeholders who are actively involved in children's hospital. Therefore, the study can add values into the body of knowledge in healthcare for children inpatients and furthermore it could provide design practitioners with clear guidelines in case of design for play experience in children's hospital.

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