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Participatory design of healthcare spaces: The case of the University Children's Hospital in Lublin

Abstract

This article presents the process of participatory design of healthcare spaces using the University Children's Hospital in Lublin as a case study. The focus was on developing design guidelines for outdoor spaces that support the needs of paediatric patients, their families, and medical staff. The starting point was the observation that existing hospital grounds often do not meet the contemporary requirements of users or the principles of therapeutic environments. The authors' goal was to determine whether the use of participatory methods and Evidence-Based Design principles enables a more effective identification of users' needs and leads to the development of more appropriate spatial solutions.

The study was conducted in 2024–2025 using an action research methodology that combined diagnosis, co-design, evaluation, and the preparation of solutions for implementation. The process included an analysis of existing spaces, design workshops involving children, the development of design alternatives, and their evaluation. Participants in the workshops included patients from the rehabilitation ward, parents, and medical staff. The methods employed included interviews, preference surveys, and drawing exercises conducted on prepared floor plans and visualizations of the spaces.

The results indicate that users primarily expect spaces that ensure safety, comfort, and the opportunity to rest, with recreational functions coming second. Elements related to nature, greenery, sensory stimuli, and opportunities for activity and social integration were of particular importance. Young patients preferred bright colours, organic spatial forms, and solutions that enable a multisensory experience of the space. The findings suggest that participatory design of healthcare environments can improve the identification of users' needs and support the development of more responsive, user-friendly, and functional hospital spaces.

Key words: children's hospital design, child-centred participation, healthcare architecture

Introduction

Contemporary healthcare facility design increasingly takes into account not only functional and technological requirements but also the impact of the built environment on users' well-being, comfort, and recovery process. Outdoor spaces play a particularly important role, as they can promote rest, reduce stress, and foster social integration among patients, their caregivers, and staff. In the case of children's hospitals, these spaces are of particular importance due to the varying stages of development among patients, their limited independence, and their dependence on parents or

caregivers, which translates into specific physical, emotional, and social needs. Despite growing awareness of the concept of a "healing environment", existing hospitals often lack appropriately adapted outdoor areas, and the existing green infrastructure does not meet the actual needs of users.

The subject of the research presented in this article is the outdoor spaces at the University Children's Hospital in Lublin (USD) – the largest facility of its kind in southeastern Poland. The hospital was built in the 1980s, and its architectural form is typical for facilities of this type: the first two floors house general functions (diagnostic, educational, office, and outpatient clinics), while the hospital wards are located on the upper floors of the building. To provide additional light to specific areas within the building, there are atria and courtyards that vary in terms of accessibility, layout, and proportions. The main entrance is a high-traffic area and the first point of orientation for parents and patients. For these reasons, the University Children's Hospital

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in Lublin can be considered, in many respects, a representative example of hospital buildings constructed in the second half of the 20th century, which are currently grappling with the challenge of modernization and adaptation to contemporary needs.

The reason for undertaking this study was the need to develop spatial solutions that support the daily functioning of hospital users and better address their functional, social, and recreational needs. Another important motivation was the conviction that the design of healthcare spaces should be based not only on expert knowledge but also on the experiences and preferences of users. Consequently, the objective of the study was to develop design guidelines for the outdoor spaces of a children's hospital based on design workshops, surveys, and participatory activities involving patients, parents, and medical staff.

The hypothesis was that design workshops conducted using a participatory model and in accordance with the principles of Evidence-Based Design enable a more effective identification of users' needs and lead to the development of more appropriate spatial solutions for the hospital environment. It was also assumed that involving users in the co-design process reveals needs that are difficult to identify using standard design methods alone. However, actively engaging end users is still not a widespread design practice. The study combined qualitative and quantitative methods and was grounded in action research methodology, the detailed process of which is presented later in this article.

State of research

Participatory design is not only a practical approach but also a research tool that fits within the field of architectural research. Research on healthcare architecture indicates that the physical environment of medical facilities can influence patients' well-being, stress levels, comfort of use, and the course of recovery. A classic point of reference remains the study by Roger S. Ulrich (1984), which demonstrated the beneficial effect of views of greenery on patients following surgical procedures. Authors of subsequent publications have expanded on this line of research, pointing out that design decisions regarding lighting, noise, contact with nature, spatial orientation, and privacy can be significant for the quality of care and the safety of users (Devlin, Arneill 2003; Ulrich et al. 2008).

In this context, Evidence-Based Design (EBD) – which involves making design decisions based on empirical data and verified research – plays a significant role. D. Kirk Hamilton and David H. Watkins (2008) emphasized that EBD does not mean the mechanical application of universal models, but rather requires the interpretation of research findings in relation to a specific program, location, and user groups. In the case of children's hospitals, it is therefore particularly important to combine expert knowledge with an understanding of the local needs of patients, parents, and staff. The most important finding from the systematic reviews conducted between 2009 and 2018 by Emelie P. Bock and co-authors (2021) was that new or renovated hospital environments were generally rated more highly than older facilities by children, parents, and staff alike. At the same time,

these authors emphasized that although the concept of EBD has been well developed in relation to the design of hospitals for adults, knowledge regarding paediatrics remains limited. Children have different needs than adults – the hospital environment should not only support treatment but also emotional, social, and cognitive development.

Equally important for the development of research on healing environments is the concept of “therapeutic landscapes”. Wilbert M. Gesler (1992) noted that the therapeutic nature of a space stems not only from its physical characteristics but also from social relationships, experiences, and the meanings attributed to the place. With regard to gardens and outdoor spaces in medical facilities, Clare Cooper Marcus and Naomi A. Sachs (2013) emphasized the importance of designing recovery spaces tailored to different user groups and their subsequent evaluation. Research by Sandra Whitehouse and co-authors (2001) on a garden at a children's hospital showed that such spaces can be perceived as supporting stress reduction, energy restoration, and user satisfaction. Magdalena Jamrozik-Szatanek (2017) highlighted the role of broadly defined recreational spaces as important elements of the therapeutic environment in children's hospitals. The researcher divided these spaces into: rooms specifically dedicated to rest, recreation, and play, and multifunctional areas, with atria appearing in both categories. Agata Gawlak (2019) highlighted the importance of a hospital's public areas – including lobbies, hallways, reception desks, waiting rooms, the entrance area, and the building's immediate surroundings – in shaping its image. In these areas, it is possible to incorporate elements of nature and art, as well as other features that reduce stress and improve well-being. The importance of contact with nature has also been confirmed by research in environmental psychology. Rachel Kaplan and Stephen Kaplan (1989) described the restorative potential of natural environments, while Stephen R. Kellert, Judith H. Heerwagen, and Martin L. Mador (2008) developed the concept of biophilic design, highlighting the need to incorporate natural elements into the built environment.

Research on participation and co-design constitutes a separate line of inquiry. Henry Sanoff (1999) emphasized the importance of methods of public participation in design and planning, while Elizabeth B.N. Sanders and Pieter J. Stappers (2008) described the shift from designing “for the user” to designing “with the user”. In the case of children, the concept proposed by Roger A. Hart (1992) is also significant; he distinguished between apparent participation and actual co-decision-making. In Polish research on healthcare facilities, Piotr Springer and Agata Gawlak (2025) presented ways to use statistical methods to assess users' preferences and their willingness to participate in the design process. The study involved medical staff from selected hospitals as well as caregivers of patients in the emergency room of a paediatric hospital and confirmed the usefulness of a systematic analysis of user needs during the planning and design phases of a project.

Haohua Zheng and co-authors (2024) presented a more advanced approach to designing children's hospitals, proposing a model based on the integration of the Analytic Hierarchy Process (AHP), Quality Function Deployment (QFD),

and the Theory of Inventive Problem Solving (TRIZ), which enables the systematic translation of children's needs into specific spatial solutions. This model involved identifying user needs while taking into account the psychological and physiological characteristics of children, establishing a hierarchy of these needs, translating them into technical requirements, and resolving design conflicts. The findings of Zheng and colleagues suggested that the use of theoretical models can support the creation of more child-friendly medical environments, taking into account, among other things, personalization, attractive visual information systems, and the impact of colour schemes (Zheng et al. 2024). Zheng and colleagues emphasized, however, the need for further research on the evaluation of actual implementations in order to develop a system for designing children's hospitals based on user feedback. A team of researchers from the Silesian University of Technology, led by Elżbieta Niezabitowska (Niezabitowska et al. 2015), also recognized the role of students' conceptual and theoretical studies as architectural research related to design.

The results of research to date thus point to the need to combine EBD, participation, workshop methods, and the design of therapeutic outdoor spaces. There is still a lack of analyses that take children's perspectives into account, and it is necessary to develop methods of co-design and participatory design (Bock et al. 2021). Full processes in which identifying user preferences, exploring design alternatives, conducting survey evaluations, and preparing for implementation form a single, coherent research-and-design cycle are described relatively rarely.

Methods

The study was conducted in 2024–2025 at the University Children's Hospital in Lublin. The scope of work included the analysis and development of a concept for the hospital's outdoor spaces, particularly the entrance area, atria, and the hospital park (Fig. 1). The research process was based on the action research methodology, which combines diagnosis, co-design, evaluation, and the preparation of solutions for implementation. The research was conducted in accordance with the principles of EBD and a participatory approach, which involves the active engagement of users in the design process. Qualitative and quantitative methods were used, including a spatial inventory, interviews, design workshops, preference surveys, and an analysis of design alternatives. The research process was divided into three stages: (1) diagnosis and context analysis, (2) design workshops with patient participation, including a preference survey, and (3) development and evaluation of design alternatives.

The first stage involved assessing the spatial and functional context through an analysis of existing outdoor areas and interviews with hospital management and staff. This made it possible to identify the main organizational and functional issues and to select the spaces requiring design intervention.

"Design workshops", or stage two (Fig. 2), were conducted with the participation of 30 patients from the rehabilitation ward aged 9 to 17 (18 girls, 12 boys). As part of the workshops, interviews were conducted with 15 patients,

and a preference survey was administered to another 15 patients. After the workshops concluded, a preference survey was additionally conducted among 15 parents or guardians of the patients. A total of 45 people participated in the second stage of the research activities, although parents and guardians did not participate directly in the design workshops. The drawing activities were carried out on prepared floor plans and visualizations of the space. For patients who, due to health reasons, were unable to draw on their own, architecture students participating in the study acted as their "personal assistants", carrying out the drawing task according to the child's instructions. Preferences regarding colour schemes, spatial forms, furnishings, recreational functions, and the sensory impact of the space were examined.

Involving parents in the research was very important given the contemporary approach to their role in the treatment and rehabilitation process. The role of family members in a children's hospital is much more significant than in hospitals for adults. Caregivers are increasingly taking an active role in their child's treatment and remain in the hospital continuously, in some cases for quite a long time (Del Nord 2006).

In the third stage of the project, based on the collected data (Fig. 3), several design variants were prepared for individual areas of the hospital (3 variants for each of the analysed spaces). The design proposals were presented as clearly illustrated architectural concepts comprising floor plans, visualizations, and descriptions.

First, evaluative participatory workshops were conducted with 50 participants: 20 patients, 20 parents, and 10 staff representatives. Following the workshops, a separate evaluative survey was conducted among a different group of respondents, comprising 15 patients, 15 parents, and 30 medical staff members. The purpose of the survey was to evaluate the proposed solutions and select the preferred design options. Both activities were part of the third stage of the research and served to verify the developed concepts. The results obtained formed the basis for formulating design guidelines and developing solutions intended for implementation.

Results

Initial status – diagnosis

As a result of the first stage of the study, four spaces were selected for further analysis and design development: the main entrance area (1), the atrium for children and parents (2), the atrium for staff (3), and the area of undeveloped tall vegetation – the park (4). Table 1 presents their basic characteristics and the constraints resulting from the current local zoning plan.

First workshop

- User preferences regarding spatial elements

In order to conduct workshops with children of various ages and health conditions, it was necessary to prepare introductory materials that would facilitate effective communication. During the workshops, the children were shown



Fig. 1. The area of the University Children's Hospital in Lublin covered by the study and design project: a) entrance area, b) atrium for children and parents, c) staff atrium, d) park adjacent to the hospital, e) location map of the spaces covered by the study (photo by R. Strojny, map: R. Strojny based on google maps)

Il. 1. Obszar Uniwersyteckiego Szpitala Dziecięcego w Lublinie objęty badaniem i opracowaniem projektowym: a) strefa wejściowa, b) atrium dla dzieci i rodziców, c) atrium dla personelu, d) park przy szpitalu, e) schemat usytuowania przestrzeni objętych opracowaniem (fot. R. Strojny, mapa: R. Strojny na podstawie google maps)

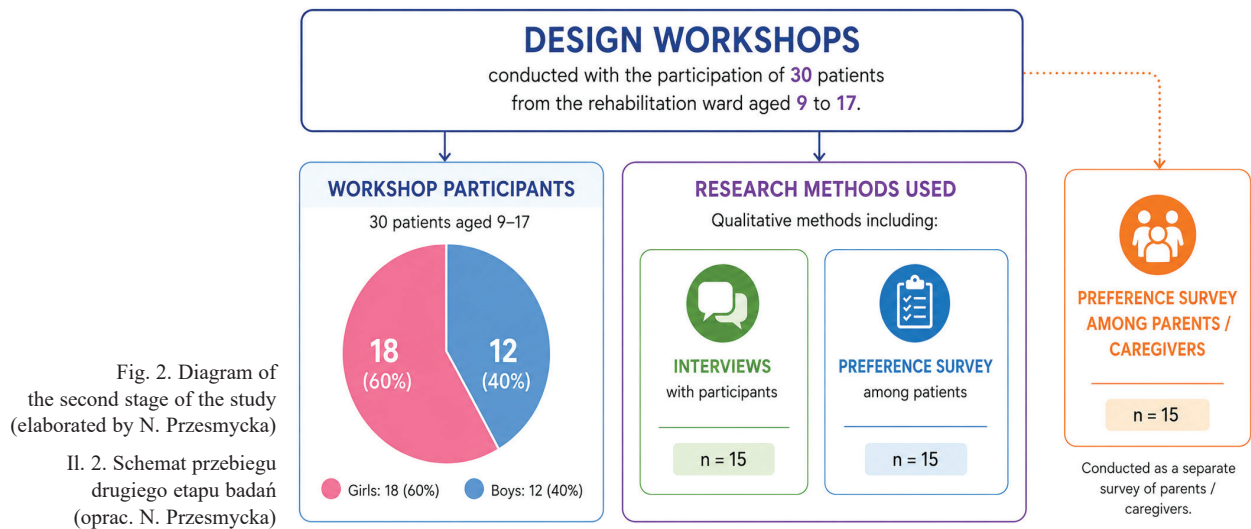


Fig. 2. Diagram of the second stage of the study (elaborated by N. Przesmycka)

Il. 2. Schemat przebiegu drugiego etapu badań (oprac. N. Przesmycka)

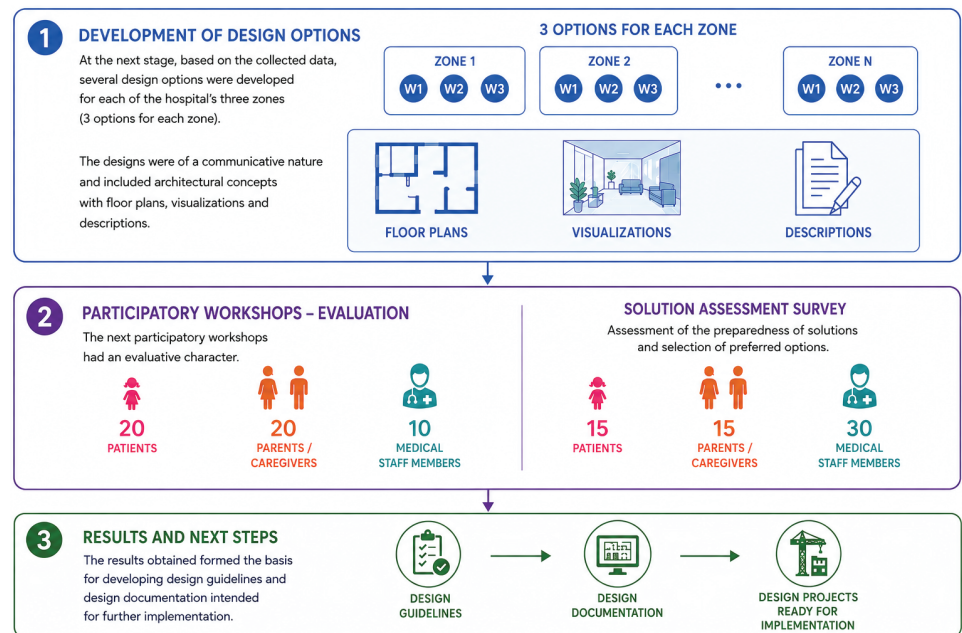


Fig. 3. Diagram of the third stage of the study (elaborated by N. Przesmycka)

Il. 3. Schemat przebiegu trzeciego etapu badań (oprac. N. Przesmycka)

Table 1. Summary of the basic characteristics and constraints of the analysed outdoor spaces at the University Children's Hospital in Lublin (elaborated by N. Przesmycka)

Tabela 1. Zestawienie podstawowych cech i uwarunkowań analizowanych przestrzeni zewnętrznych Uniwersyteckiego Szpitala Dziecięcego w Lublinie (oprac. N. Przesmycka)

Space	Characteristics			
	accessibility	area [m ²]	tall vegetation	site furnishings / local zoning plan notes
1. Main entrance area	publicly accessible; public space	2900	none	Benches, an unused fountain, an informal smoking area, and retaining walls. According to the local zoning plan, the main pedestrian and bicycle route is to pass through this area and connect with the route in Area 4.
2. Atrium for children and parents	accessible during specified hours	500	one tree – an approximately 30-year-old spruce	wheelchair-accessible swing
3. Staff atrium	accessible to staff only	80	none	none
4. Undeveloped area of tall vegetation	publicly accessible; public space	5200	approximately 30-year-old self-seeded trees – lindens, maples, and ashes	No site furnishings. A well-worn informal path crosses the area. According to the local zoning plan, part of the site is designated for development, with provision for a dedicated public space.

CHILDREN'S PREFERENCES IN SELECTING SPACE ELEMENTS

Percentage of children who chose a given element.

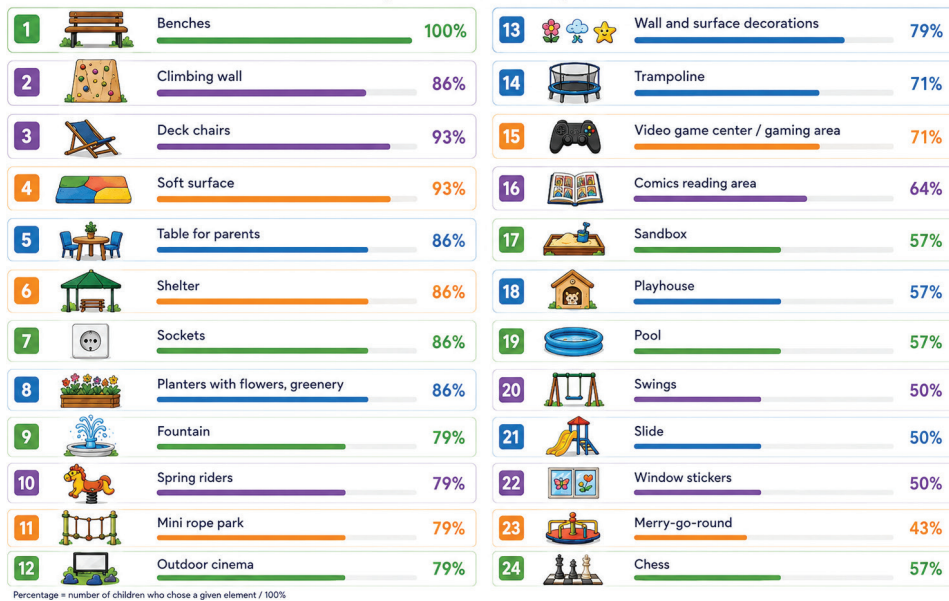


Fig. 4. Children's preferences in selecting elements of the space – summary (elaborated by N. Przesmycka)

II. 4. Preferencje dzieci w wyborze elementów przestrzeni – zestawienie (oprac. N. Przesmycka)

examples of solutions based on geometric and organic spatial design. A total of 87.5% of respondents preferred organic forms, whereas 12.5% preferred geometric forms. This trend was confirmed by further observations: among the motifs the children “liked,” rounded, fluid forms based on curved lines predominated.

The children were then asked to draw or indicate the desired elements within the atrium space. To this end, simplified floor plans and sketches of characteristic views of the spaces under study were provided for the children to complete on their own. Children who, for various reasons, were unable to draw or write on their own were assigned an assistant – an architecture student – who acted as the “child’s hand” without suggesting any solutions. Analysis of the results revealed a clear predominance of elements related to user comfort and spatial safety. The most important elements (as indicated by the children themselves) were considered to be basic amenities such as benches, soft surfaces, a covered area, and tables for parents (Fig. 4). Interestingly, these elements were chosen by the children over playground equipment (swings, slides, merry-go-rounds, etc.). Among the “organizational” suggestions regarding the space were also: an outdoor movie theatre, a games area, and a cat house. Subsequently, all submitted proposals were compiled, and their importance was verified in a survey in which participants again indicated their preferred elements of the space.

The results indicate that users primarily expect conditions conducive to rest, safety, and the presence of a caregiver. Recreational elements appear further down the list. This is consistent with the findings from EBD research, which emphasize the importance of opportunities for rest, a sense of control over the space, and social support in reducing stress among users of medical facilities (Ulrich et al. 2008). Similarly, Marcus and Sachs (2013) and Whitehouse et al. (2001) highlighted the important role of seating areas, shelter from the elements, and spaces that facilitate

recovery within the hospital environment. The workshop results thus confirm that children’s needs are not limited to play but also include comfort and passive rest.

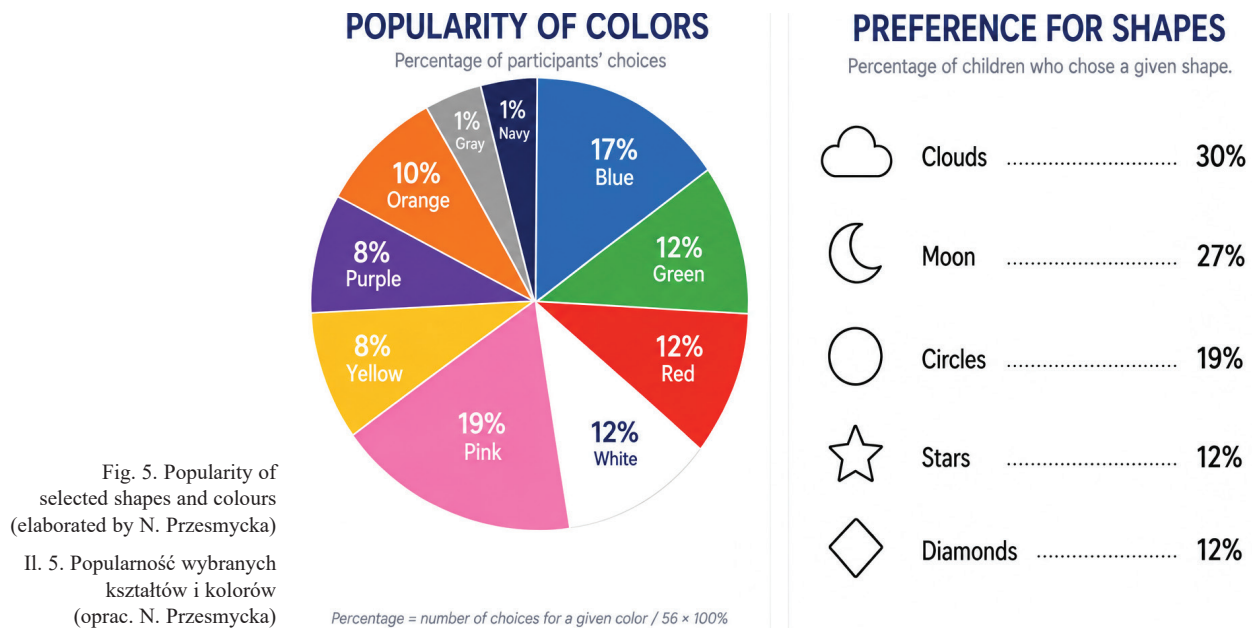
• The importance of recreational and social functions

In addition to the basic elements, recreational and social functions also played a significant role. Among the most frequently mentioned were simple play equipment, such as swings, slides, and merry-go-rounds, as well as more complex features, such as a mini-adventure course, an outdoor movie theatre, and game areas. Importantly, some of these suggestions – such as an outdoor movie theatre or food service areas – go beyond the standard solutions typically found in healthcare facilities. During the discussion, many children pointed out the need for a food service option in the studied space – such as a stand selling ice cream, kebabs, or pizza – but because these options were not feasible within the project constraints, this expectation was not included in the list of preferences.

These results are consistent with research on paediatric environments, which emphasizes the importance of play, activity, and social interaction for reducing stress and supporting children’s emotional and social development during hospitalization (Del Nord 2006; Jamrozik-Szatanek 2017; Bock et al. 2021). From an EBD perspective, these functions can promote positive distraction and social support (Ulrich et al. 2008). Requests for an outdoor movie theatre or a dining area thus point to the need to normalize everyday experiences, although they do not constitute independent evidence of the therapeutic impact of these solutions.

• The role of sensory stimuli

An important aspect highlighted by study participants was the impact of the space on the senses. Respondents noted the significance of water features (fountains, pools), scents (flowers, grass, food aromas), and the sounds of nature (birdsong and rustling leaves). At the same time, they



emphasized the role of greenery, art, and the presence of animals as features perceived by participants as contributing to well-being.

The results obtained are consistent with research on the restorative effects of nature and the design of therapeutic environments. Ulrich et al. (2008) indicated that contact with nature and positive environmental stimuli can reduce stress, while Kaplan and Kaplan (1989) emphasized the restorative potential of natural environments. Marcus and Sachs (2013) and Whitehouse et al. (2001) also highlighted the importance of vegetation, water, and multisensory experiences in hospital spaces. The workshop findings thus support the call for integrating natural and artistic elements while maintaining a balance between stimulation and opportunities for quiet and rest.

• Formal preferences – colours and shapes

An analysis of aesthetic preferences revealed a clear preference for bright and vivid colours, such as pink, blue, and green. None of the children selected brown or black. In terms of spatial forms, organic and fluid shapes dominated, being preferred significantly more often than geometric patterns (Fig. 5). This finding is consistent with broader, earlier studies showing that children more often choose bright, vivid colours (blue, red, pink) and are less fond of dark or neutral colours (brown, grey, black) (Boyatzis, Varghese 1994). However, children's colour preferences are not fixed. Research suggests that younger children prefer more intense and warmer colours, while interest in cooler and more subdued colours increases with age (Child, Hansen and Hornbeck 1968). In light of these findings, greater variation in colour preferences could be expected within the present group of children aged 9–17 than in the preschool-age groups described in some earlier studies¹. It proves even

more difficult to reconcile the types of spaces (enclosed, open) preferred by children of different ages, as interests, goals, and activities that can be planned in a given environment change with age. Children's prior experiences with a specific type of space are also particularly important, as memories of the social and individual activities undertaken there influence environmental preferences and the evaluation of a place (Del Nord 2006).

The results obtained are consistent with studies indicating that children more often choose bright and saturated colours, although these preferences depend on age, gender, and prior experiences (Boyatzis, Varghese 1994; Child, Hansen and Hornbeck 1968; Del Nord 2006). However, the aesthetic preferences reported cannot be equated with the therapeutic effects of specific colours. Research in the field of EBD indicates that the perception of colour also depends on the intensity and hue of light, contrast, the function of the space, and the overall level of environmental stimulation (Lindahl et al. 2023). The participants' preferences were therefore treated as one of several design considerations and were assessed alongside the need to ensure visual comfort, limit sensory overload, and accommodate children of different ages.

Second workshop – evaluation

• Results of the evaluation of design alternatives

Based on the first workshops (Fig. 6a, b), design concepts were developed that clearly illustrated solutions for the four selected spaces. Efforts were made to incorporate as many of the children's suggestions from the first workshops as possible, finding a place for them in various spaces: the main entrance area (1), the atrium for children and parents (2), the atrium for staff (3), and the area of tall, undeveloped greenery – a park with a playground (4). The design

¹ A frequently studied aspect of children's color preferences concerns gender-related differences in preferences for pink and blue. The results show that around the ages of 2–3, more pronounced gender dif-

ferences emerge – girls are more likely to choose pink and purple, while boys are more likely to avoid pink than to actively prefer blue (LoBue, DeLoache 2011).

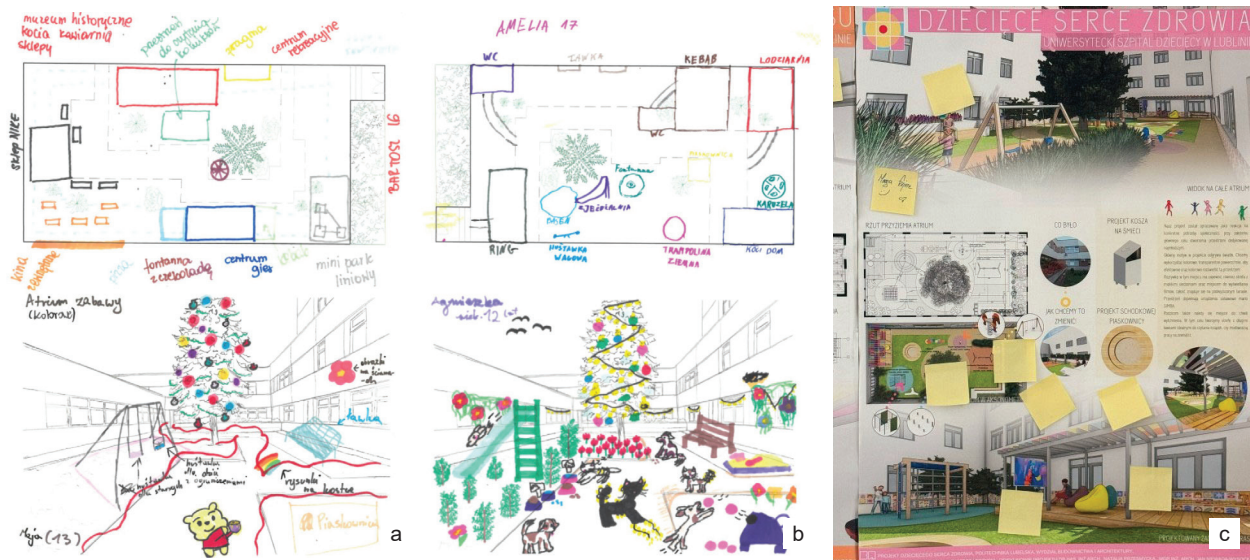


Fig. 6. Selected drawings by children from the workshops: a) one vision of the space, including an outdoor movie theatre, b) another vision of the space with an area for animals and food service facilities, c) one of the design concepts selected for implementation by the largest group of patients and parents, created by architecture students G. Kucharska and K. Łęczycki – one of the methods used to select the concept involved sticking yellow sticky notes with comments onto the design boards (photo by R. Strojny)

Il. 6. Wybrane rysunki dzieci wykonane podczas warsztatów: a) jedna z wizji zagospodarowania przestrzeni, obejmująca kino plenerowe, b) wizja przestrzeni z miejscem dla zwierząt oraz zapleczem gastronomicznym, c) jeden z projektów wybranych do realizacji przez największą grupę pacjentów i rodziców, autorstwa studentów architektury G. Kucharskiej i K. Łęczyckiego – jedną z metod wyboru koncepcji było umieszczanie żółtych karteczek samoprzylepnych z komentarzami na planszach projektowych (fot. R. Strojny)

concepts were printed on presentation boards, with three alternatives presented and discussed for each space. The presentations were followed by a discussion. Each participant (patients, parents, staff) could select their preferred concepts and provide qualitative comments on the proposed solutions (Fig. 6c). As a result of the evaluation studies, preferred variants were identified for each space. The concepts presented below received the highest ratings.

The selected design concept for the main entrance area aimed to emphasize its prominent and welcoming character while transforming part of the space into an additional waiting area. An intimate and contemplative atmosphere was sought through the introduction of site furnishings and landscape elements, including benches, a pergola, planters with ornamental plants, and the restoration of the fountain. An important element was the variety of surface materials. The use of colour in this space was limited due to its formal character.

The concept selected for further development – a large atrium for children and parents – featured a clear spatial layout based on preserving the existing tree and introducing varied surfaces: a covered wooden terrace, flexible surfaces around the play equipment, and a sunken sandbox. Seating areas were integrated into the low walls separating the technical zone and arranged under the canopy. Several playground structures were proposed (a rocker, a swing), as well as those that can simultaneously support rehabilitation (climbing frames, balance beams). The terrace canopy incorporated colourful, translucent elements, allowing the space to be used even in inclement weather.

Among the presented park development concepts, the participants selected the version based on minimal interfer-

ence with the site, incorporating natural materials (wood), and featuring a clear functional layout: an entrance area, zones for active recreation and passive rest, and playgrounds. An important element was the variety of seating options: ranging from classic benches to amphitheatre-style seating and the option to sit directly on the ground.

The smallest of the spaces studied – the staff atrium – was treated as a relaxation area with access restricted exclusively to this group of users. To reduce the atrium's perceived height, elements were designed to partially cover and shade it, while also serving as a support structure for climbing plants. Due to underground utilities and the resulting inability to plant directly in the ground, planting was limited to ornamental vegetation in planters. Despite the complete exclusion of patients and their families from using this area, it is visually “accessible” from the general circulation spaces for all user groups, hence the desire to incorporate attractive forms of decorative greenery.

The process of selecting design alternatives demonstrated the usefulness of the research method, enabling a transition from general preferences to specific design decisions. The use of design alternatives proved to be not only a design tool but also an essential element of the research process, allowing users to evaluate realistic spatial solutions.

• Implementation

Based on the concepts and following an evaluation conducted during the second participatory workshop, specific design guidelines were formulated. Based on the presented concepts, the hospital administration identified two areas for implementation: the main entrance and the patient atrium. Students from the “Architecture of Health” Research

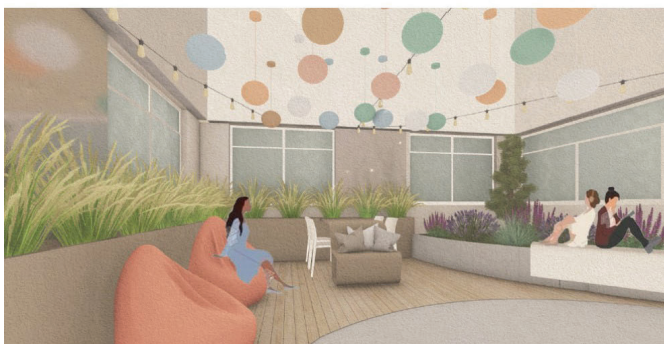
MAIN ENTRANCE



CHILDREN AND PARENTS' ATRIUM



STAFF ATRIUM



PARK



Fig. 7. Selected design variants for each space – the entrance area, the atrium for children and parents, the atrium for staff, and the park adjacent to the hospital (elaborated by P. Pasik, N. Łukasiewicz, M. Łęcka, K. Marchewka, W. Moczol, K. Łęczycki, G. Kucharska, I. Bulavina, M. Kołodziejczyk)

Il. 7. Wybrane warianty projektów dla każdej przestrzeni – strefy wejściowej, atrium dla dzieci i rodziców, atrium dla personelu oraz parku przy szpitalu (oprac. P. Pasik, N. Łukasiewicz, M. Łęcka, K. Marchewka, W. Moczol, K. Łęczycki, G. Kucharska, I. Bulavina, M. Kołodziejczyk)

Club at the Faculty of Civil Engineering and Architecture of the Lublin University of Technology developed detailed design plans, which were submitted to the hospital. Based on these plans, tenders will be announced as funding be-

comes available. Regarding the area of tall greenery adjacent to the hospital – the hospital park zone – the hospital commissioned a design, including playground equipment, from a manufacturer (Stowarzyszenie Przyjaciół USzD 2025) in

parallel with the conceptual work. The presented solution was not subject to consultation or broader discussion. The centrepiece of the playground will be a slide shaped like a lighthouse. The project's creators explain the idea as follows: *The light of a lighthouse always serves as a guide to a safe place, despite the turbulence and storms at sea. And often, the healing process is like a vast ocean of raging waves, from which a majestic tower with a light emerges – the child's return to health* (Pop 2024; Szczebiot 2025). The colours preferred by children are usually bright, saturated hues with positive emotional associations; however, effective design of therapeutic spaces requires balancing visual appeal with the need to limit sensory overload. This latter condition is quite difficult to meet if the design relies on the selection of ready-made elements (such as playground equipment) while limiting the use of natural building materials. The analysed playground design does not provide dedicated areas or amenities for passive recreation and rest, nor does it reference the natural elements present in the park in any way. Fundraising efforts for the playground's construction are currently ongoing.

Conclusions

The described process involves pre-design analyses aimed at developing optimal solutions for the design of healthcare spaces, in which identifying user preferences, exploring design alternatives, conducting survey evaluations,

and preparing for implementation formed a single, coherent, planned research-and-design cycle.

The findings were consistent with previous research indicating that the physical environment can shape patients' experiences and that paediatric users have specific age-related and developmental needs. The present study did not assess clinical or psychological outcomes; rather, it identified users' preferences and translated them into design considerations. The participatory process indicated that involving users can help identify needs that may be difficult to capture using standard design methods alone. The results indicate that children expected hospital outdoor spaces to provide, above all, safety, comfort, and opportunities for rest, while play-oriented and recreational features were of secondary importance. Sensory elements, contact with nature, physical activity, and the creation of environments that facilitate the normalization of daily experiences during hospitalization were also important to participants.

The methodology employed – which included identifying user preferences, developing design alternatives, evaluating them, and preparing solutions for implementation – demonstrated the usefulness of the participatory model for identifying user needs and translating them into design alternatives. The research findings indicate that design carried out in collaboration with users can contribute to the development of more responsive, user-friendly, and health-supportive hospital environments that meet the actual needs of children, parents, and medical staff.

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References

- Bock, Emelie P., Stefan Nilsson, Per-Anders Jansson, et al. "Literature Review: Evidence-Based Health Outcomes and Perceptions of the Built Environment in Pediatric Hospital Facilities." *Journal of Pediatric Nursing* 61 (2021): e42–e50. <https://doi.org/10.1016/j.pedn.2021.04.013>.
- Boyatzis, Chris J., and Reenu Varghese. "Children's Emotional Associations with Colors." *The Journal of Genetic Psychology* 155, no. 1 (1994): 77–85. <https://doi.org/10.1080/00221325.1994.9914760>.
- Child, Irvin L., Jens A. Hansen, and Frederick W. Hornbeck. "Age and Sex Differences in Children's Color Preferences." *Child Development* 39, no. 1 (1968): 237–47. <https://doi.org/10.2307/1127374>.
- Del Nord, Romano, ed. *Lo Stress ambientale nel progetto dell'Ospedale pediatrico indirizzi tecnici e suggestion architettoniche*. Motta Architettura, 2006.
- Devlin, Ann S., and Allison B. Arneill. "Health Care Environments and Patient Outcomes: A Review of the Literature." *Environment and Behavior* 35, no. 5 (2003): 665–94. <https://doi.org/10.1177/0013916503255102>.
- Gawlak, Agata. *Architektura szpitala: izba przyjęć w szpitalu pediatrycznym*. Wydawnictwo Politechniki Poznańskiej, 2019.
- Gesler, Wilbert M. "Therapeutic Landscapes: Medical Issues in Light of the New Cultural Geography." *Social Science and Medicine* 34, no. 7 (1992): 735–46. [https://doi.org/10.1016/0277-9536\(92\)90360-3](https://doi.org/10.1016/0277-9536(92)90360-3).
- Hamilton, D. Kirk, and David H. Watkins. *Evidence-Based Design for Multiple Building Types*. Wiley, 2008.
- Hart, Roger A. *Children's Participation: From Tokenism to Citizenship*. UNICEF International Child Development Centre, 1992.
- Jamrozik-Szatanek, Magdalena. "Przestrzeń rozrywki jako ważny element uzdrawiającego środowiska w szpitalach pediatrycznych." In *Badania interdyscyplinarne w architekturze: BIWA 2. Monografia konferencyjna. T. 3: Potrzeby osób starszych*, edited by Beata Komar, Anna Szewczenko. Wydział Architektury Politechniki Śląskiej, 2017.
- Kaplan, Rachel, and Stephen Kaplan. *The Experience of Nature: A Psychological Perspective*. Cambridge University Press, 1989.
- Kellert, Stephen R., Judith H. Heerwagen, and Martin L. Mador, eds. *Biophilic Design: The Theory, Science and Practice of Bringing Buildings to Life*. Wiley, 2008.
- Lindahl, Jeanette, Hans Thulesius, Helle Wijk, David Edvardsson, and Carina Elmqvist. "The Perceived Support From Light and Color Before and After an Evidence-Based Design Intervention in an Emergency Department Environment: A Quasi-Experimental Study." *HERD* 16, no. 2 (2023): 109–24. <https://doi.org/10.1177/19375867221150215>.
- LoBue, Vanessa, and Judy S. DeLoache. "Pretty in Pink: The Early Development of Gender-Stereotyped Colour Preferences." *British Journal of Developmental Psychology* 29, no. 3 (2011): 656–67. <https://doi.org/10.1111/j.2044-835X.2011.02027.x>.
- Marcus, Clare C., and Naomi A. Sachs. *Therapeutic Landscapes: An Evidence-Based Approach to Designing Healing Gardens and Restorative Outdoor Spaces*. Wiley, 2013.
- Niezbabowska, Elżbieta, Magdalena Jamrozik-Szatanek, Aleksandra Bryzek, et al. *Szpitala dziecięce: metodologia okolo projektowych badań architektonicznych na przykładzie opracowań studenckich*. Wydawnictwo Politechniki Śląskiej, 2015.

- Pop, Patrycja. "Chcę zbudować plac zabaw dla małych pacjentów w Lublinie. Przyjdź na koncert i dołóż cegielkę do tego pomysłu." *Radio Eska Lublin*. Published December 10, 2024. Accessed May 20, 2026, at <https://lublin.eska.pl/chca-zbudowac-plac-zabaw-dla-malych-pacjentow-w-lublinie-przyjdź-na-koncert-i-doloz-cegielke-do-tego-pomyslu-aa-3454-sb1v-cKXG.html>.
- Sanders, Elizabeth B.N., and Pieter J. Stappers. "Co-creation and the New Landscapes of Design." *CoDesign* 4, no. 1 (2008): 5–18. <https://doi.org/10.1080/15710880701875068>.
- Sanoff, Henry. *Community Participation Methods in Design and Planning*. Wiley, 1999.
- Springer, Piotr, and Agata Gawlak. "Correlations and statistical analyses in evaluating user preferences in participatory design of healthcare facilities." *Architectus*, no. 4 (84) (2025): 167–74. <https://doi.org/10.37190/arc250416>.
- Szczebiot, Agnieszka. "Plac zabaw przy Uniwersyteckim Szpitalu Dziecięcym w Lublinie." Published March 18, 2025. Accessed May 20, 2026, at <https://szkolaprzyshpitalna.pl/plac-zabaw-przy-uniwersyteckim-szpitalu-dzieciecym-w-lublinie/>.
- Ulrich, Roger S. "View Through a Window May Influence Recovery from Surgery." *Science* 224, no. 4647 (1984): 420–1. <https://doi.org/10.1126/science.6143402>.
- Ulrich, Roger S., Craig Zimring, Xuemei Zhu, et al. "A Review of the Research Literature on Evidence-Based Healthcare Design." *HERD* 1, no. 3 (2008): 61–125. <https://doi.org/10.1177/193758670800100306>.
- Stowarzyszenie Przyjaciół USzD. "Utworzenie placu zabaw dla pacjentów przy Uniwersyteckim Szpitalu Dziecięcym w Lublinie." *Uniwersytecki Szpital Dziecięcy w Lublinie*. Published December 18, 2025. Accessed May 20, 2026, at <https://www.uszd.lublin.pl/stowarzyszenie-przyjaciol-uszd/utworzenie-placu-zabaw-dla-pacjentow-przy-uniwersyteckim-szpitalu-dzieciecym-w-lublinie,-news,28,1596.php>.
- Whitehouse, Sandra, James W. Varni, Michael Seid, et al. "Evaluating a Children's Hospital Garden Environment: Utilization and Consumer Satisfaction." *Journal of Environmental Psychology* 21, no. 3 (2001): 301–14. <https://doi.org/10.1006/jev.2001.0224>.
- Zheng, Haohua, Lingying Liu, Qi Zhang, Yihan Wang, and Yangyang Wei. "Children's Hospital Environment Design Based on AHP/QFD and Other Theoretical Models." *Buildings* 14, no. 6 (2024): 1499. <https://doi.org/10.3390/buildings14061499>.

Streszczenie

Partycypacyjne projektowanie przestrzeni ochrony zdrowia na przykładzie Uniwersyteckiego Szpitala Dziecięcego w Lublinie

W artykule przedstawiono proces partycypacyjnego projektowania przestrzeni ochrony zdrowia na przykładzie Uniwersyteckiego Szpitala Dziecięcego w Lublinie. Skoncentrowano się na opracowaniu wytycznych projektowych dla przestrzeni zewnętrznych wspierających potrzeby pacjentów pediatrycznych, ich rodzin oraz personelu medycznego. Punktem wyjścia była obserwacja, że istniejące przestrzenie przyszpitalne często nie odpowiadają współczesnym wymaganiom użytkowników oraz założeniom środowisk terapeutycznych. Celem autorów badania było sprawdzenie, czy zastosowanie metod partycypacyjnych oraz założeń Evidence-Based Design umożliwia skuteczniejsze rozpoznanie potrzeb użytkowników i prowadzi do opracowania bardziej trafnych rozwiązań przestrzennych.

Badania przeprowadzono w latach 2024–2025, wykorzystując metodologię action research łączącą diagnozę, współprojektowanie, ewaluację oraz przygotowanie rozwiązań do wdrożenia. Proces obejmował analizę istniejących przestrzeni, warsztaty projektowe z udziałem dzieci, opracowanie wariantów projektowych oraz ich ewaluację. W warsztatach uczestniczyli pacjenci oddziału rehabilitacji, rodzice oraz personel medyczny. Zastosowano wywiady, badania preferencji oraz działania rysunkowe realizowane na przygotowanych wcześniej rzutach i wizualizacjach przestrzeni.

Uzyskane wyniki wskazują, że użytkownicy oczekują przede wszystkim przestrzeni zapewniających bezpieczeństwo, komfort i możliwość odpoczynku, a dopiero w dalszej kolejności funkcji rozrywkowych. Szczególne znaczenie miały elementy związane z naturą, zielenią, bodźcami sensorycznymi oraz możliwością aktywności i integracji społecznej. Młodzi pacjenci preferowali jasne kolory, organiczne formy przestrzenne oraz rozwiązania umożliwiające wielozmysłowe doświadczenie przestrzeni. Na podstawie uzyskanych rezultatów potwierdzono, że partycypacyjne projektowanie środowisk ochrony zdrowia pozwala lepiej identyfikować potrzeby użytkowników i może prowadzić do tworzenia bardziej przyjaznych, terapeutycznych oraz funkcjonalnych przestrzeni szpitalnych.

Słowa kluczowe: projektowanie szpitali dziecięcych, partycypacja dzieci, architektura ochrony zdrowia