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Active Care - Building Design for Habilitation Centers

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Abstract. This paper explores the building design of a Habilitation Center that promotes healthy lifestyles of people with diverse abilities. Habilitation care moves the focus of healthcare from a disease curing approach to lifelong health development. Studies show that the design of healthcare buildings can contribute to improving care and by extension, it is expected that building design can contribute to improving habilitation care. However, in practice, there is limited experience in designing habilitation facilities, particularly concerning emerging healthcare approaches such as health promotion. This paper describes the outcomes of a master thesis that was part of a pre-study for a habilitation center that focused on design strategies and solutions that stimulate physical activity for diverse users. The main research question was*: In what way can building design promote active behavior for all types of building users?* The study adopted a research by design approach focused on (1) understanding user needs, (2) developing design strategies, and (3) proposing a design solution. The results list several design strategies for habilitation buildings and propose how these can be implemented. These guidelines include strategies for physical movement such as indoor and outdoor exercise areas, climbing walls and access to nature. These results may support the development of the new habilitation center, while also introducing theoretical ideas and design guidelines regarding active design. The study can be used to inspire and discuss the design and development of habilitation centers specifically, and more generally healthcare buildings that adopt new care approaches such as health promotion.

Keywords: Healthcare, Architecture, Health Promotion, Active Design, Habilitation, Habilitation Facilities, Rehabilitation.

1. Introduction

This paper is based upon a master thesis in architecture which was part of a pre-study for the planning and design of a habilitation center in Uppsala, Sweden [1]. The paper responds to questions relevant to the UN Sustainable Development Goal of "good health and wellbeing". More specifically, it contributes to topics such as "social inclusion for liveable societies" and "promoting green structures and integrating greenery in the building design" [2], as well as promoting principles of active behavior. The premises of the paper are that when designing habilitation centers focus must be placed on the role of a built environment that stimulates physical activity and social interaction while considering the diverse needs and abilities of people.

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Habilitation is a term rarely used in the international literature and practice. Rather rehabilitation is often used as an umbrella term. Habilitation refers to a process aimed at helping people with disabilities attain, keep or improve skills and functioning in everyday life [3]. In comparison to rehabilitation, habilitation does not focus on cure, but rather on teaching people to cope with their health status. Expanding on this, we can say that habilitation care should provide support in physical activity adapted to the needs of users, and a connection with the local community, as patients can feel disconnected from society and underrepresented [4]. Thus, the environment of a habilitation center should facilitate physical activity, attention restoration, stress reduction, and positive emotions.

2. Background

2.1 Health promotive and active building design

The built environment is an important factor for human health [5]. Currently, there is increased attention on buildings and urban design that promotes healthy behaviors [6-7] and can reduce health inequity [8]. Design for healthy behavior relates to building design that stimulates healthy diets, social interaction and physical activity [9-10]. For instance, stairs-use can be improved when stairs are visible from central points in the building and are visually attractive [11]. The attention for physical activity in design has been called Active Design [7]. Active design guidelines [7] note that walkability, meeting places, and access to outdoor spaces can improve quality of life. Active Design, however, usually does not emphasize people with diverse abilities. Health inequity concerning building design, on the other hand, focuses on vulnerable populations and making healthcare accessible and usable for them [9,12]. For instance, building design with attention for diverse users who need walking support, who use wheelchairs, or are visually impaired. This design focus on attention to diverse needs has been called Inclusive or Universal Design [12]. Inclusive Design refers to solutions that consider specifically the vulnerable population, while Universal Design aims to focus on making the design useable for everybody [12].

It can be argued that the design of habilitation centers should combine these design approaches; stimulating and challenging people to adopt healthier everyday lifestyles, including active behavior regardless of age, gender, and abilities. However, while there has been some research on the separate design approaches, there has not been so much that focused on the combination of all [10], neither on the combined implications for habilitation care.

3. Method

The method adopted was research by design and focused on the building design of a habilitation center that promotes active behavior of people with diverse abilities. The study contains several sub-questions: *What are the needs that should be incorporated in the design of the Habilitation Centre? Which design strategies can support active design for people with diverse abilities? How can these design guidelines be translated into a design proposal?* The study contained multiple iterative stages: (1) identify user needs; (2) develop design guidelines; (3) develop a design proposal.

3.1 Identify user needs

The user needs were identified through combining knowledge from literature, site-visit, interviews with patients, their caretakers, staff, a focus group with organizational management, and reference projects. The site-visit focused on understanding the organization of the current building. There was attention for the diverse activities that took place in the building, and the activities patients were doing while waiting for their appointment. There was special attention to opportunities for increasing healthy, active behavior. The observations were noted by the main author. The interviews were unstructured and happened during the site-visit. This included patients who were using the sports facilities (n=5), their caretakers (n=2), and staff responsible for those facilities (n=1). The author took notes after each conversation. The focus group involved decision-makers of the existing habilitation center who had responsibilities ranging from financial to management both on the local and regional level. The workshop focused on discussing the design of the current habilitation building, particularly on possibilities for improvement. The discussion was also informed by the initial findings from

literature, site observations, and desktop research. The main author made notes throughout and after the workshop based upon her observations. Several reference projects were examined for active design strategies and solutions that could also be used in the context of the habilitation project. These projects included: Rehabilitation Centre Groot Klimmendaal (Arnhem, The Netherlands), REHAB, Centre for Spinal Cord and Brain Injuries (Basel, Switzerland), and Frederiksbjerg School (Aarhus, Denmark).

3.2 Develop design guidelines

Based upon the initial findings several design strategies were chosen. These were revised throughout the design process for clarification in discussion with the second author, the client, and peers. The design strategies were also tested in a design proposal by the main author.

3.3 Develop a design proposal

The design proposal was developed based upon (1) the design guidelines, (2) the local circumstances, climate and legislation and (3) the programmatic requirements. This was achieved by generating physical and digital models, and sketching. The proposal tested which active and inclusive design strategies could be implemented in the specific context and how they related to each other. The design proposal was once evaluated by an external critic and an examiner (healthcare building design specialist). The design was further developed based upon the provided comments and constantly tested on the developed guidelines. The final design proposal was presented to the decision-makers, the healthcare building design specialist, and peers.

This study has some methodological limitations. The explorative approach with a limited timespan (20 weeks) involved setting the research goal, studying the user needs, develop the guidelines and developing the design proposal. This has consequences for the focus, the methods and the depth of the study. The explorative nature makes that the findings should not be generalized, mainly due to the small sample of the interview participants. Still, the design aimed at developing a conceptual proposal for the new habilitation center and the study does provide initial insights and inspiration which can be further studied. Moreover, the study provides material for discussion on active healthcare building design while research is still limited. The research method worked well for translating theoretical ideas into practical solutions and it can be beneficial for practicing architects. Being able to work on a proposal without financial restrictions allowed for conceptual ideas to be explored. Lastly, the project allowed for a broader investigation of specific user needs which can often be limited in design practice due to limited time and financial resources.

4. Results

From the collected data several needs came forward regarding the design of the new habilitation center:

- One new central habilitation building – the habilitation care should no longer be spread over 9 different buildings, should provide enough space, and follow current building standards.
- Improved site circulation - it was revealed that the site has problems with circulation flows, which are often mixed, creating confusion for the visitors.
- Healthy environment - the current buildings were harmful to the health of users.
- Additional community program - the focus group indicated that they are considering the complete redesign of the plot and the addition of new functions such as elderly care, extra administrative functions, and community information, as well as the possibility of renting or selling part of the plot.

4.1 Design guidelines

Several design guidelines were developed that promote well-being and healthy behavior while creating beautiful built environments for people and communities. These guidelines related to the building itself and the building surroundings. The guidelines for the building were:

- Stimulate physical activity - specific spaces for physical exercises such as indoor gyms, exercise spaces with different sizes, climbing walls, multipurpose areas and large open spaces for mixed activities that are accessible after-hours.
- Wayfinding - creating landmarks in the building and courtyard to improve wayfinding and create interesting views along the paths of travel.
- Challenging ground for diverse users - design should provide challenging ground for physical activity of diverse users. For instance, ramps that connect to different levels, easily accessible stairs to different departments and grand staircase.
- Access and views to nature - it should be possible for all users to view and access nature throughout the building.
- Place for social interaction - the design should create opportunities for building users and the community to meet and interact and enable informal meetings between users of the center.

The guidelines for the building surroundings were:

- Access to healthy food - access to fresh produce through food markets and urban farming.
- Lively urban site – diverse program including parks and plazas, covered and diverse circulation through the building and plot, access to public program and after-working hours activities such as cafes, gym, concerts, cultural events, art exhibitions, and establishing the 'imageability' of the place by making it part of the neighborhood (Active Design, 2010).
- Support physical activity - bicycle lanes, bicycle parking, running tracks, walking paths, sports courts, and playgrounds open to the local community.
- Seasonal design - ensuring good outdoor lighting, a variety of climate environments, for different seasons.
- Access to nature – spaces that encourage restorative activities such as gardening and inserting access to greenery throughout the building.

4.2 Design Proposal

4.2.1 The building surroundings

Considering the data gathered during the workshop with decision-makers (Figure 1) it was proposed that the outdated buildings on the plot (Figure 2) should be demolished and replaced with new functions and buildings including a preschool, elderly and student housing, and a main habilitation building (Figure 3).

Figure 1. Photo from the workshop

Figure 2. Photos of existing buildings

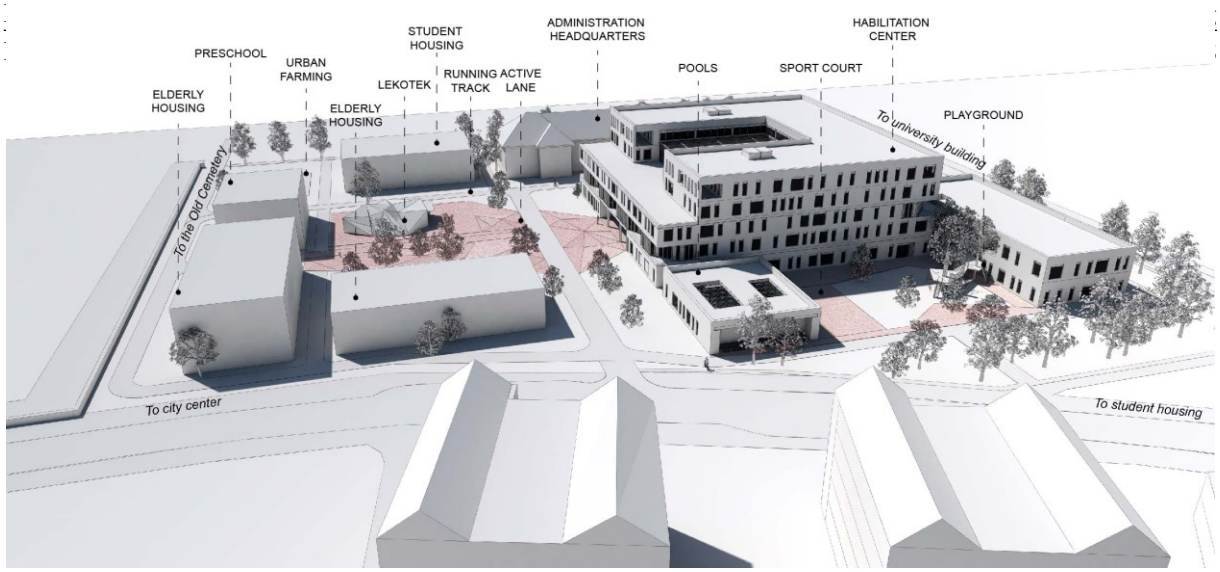

Figure 3. Illustration of the design proposal

The Urban Design strategies of the site's development included opening the plot to the main directions of the neighborhood and creating continuous paths for movement and greenery. The proposal offers a continuous path of Building and Urban Active Design Strategies with urban spaces that are connected to indoor fitness-promoting spaces.

By designing directions that can be physically accessed the site opens to the neighborhood and becomes accessible for everyone. On the site points of interest were designed to attract people. Two main paths with different characteristics were developed: the Activity Lane which connects different fitness areas and the Green Path which is a running/walking path that circles the site.

The Activity Lane is a continuous leveled terrain, designed with ramps, that stretches outside and inside. The ramps are designed to allow wheelchair access and along the path, there are different exercise features with different sizes and difficulties. The endpoints are the playground and the Lekothek. The playground area is in connection to the impaired movement department; patients can go out directly from consultation rooms into this area and exercise under medical supervision. This enables both treatment and socializing. The Lekotek is an activity center accessible for patients of the center but also people from the neighborhood. The Lekotek can function independently from the habilitation center and with different working-hours. It can also function as a healthcare teaching center where school children can come to learn about healthcare in a playful environment.

The Green Path presents different options for people to walk or run. It is designed with signs indicating distances, landmarks, and good lighting so it can be used safely during darkness. Another layer added to the plot was the greenery features such as urban farming and pocket parks. These elements are connected, intersecting with the main paths, creating a dynamic and engaging experience for users. Another strategy was to have some functions of the habilitation center open and accessible to the public. For example, a department of the center, the prosthetics workshop, can be used as a bicycle workshop after-working hours. This department is located separately and since it already has plenty of equipment people from the neighborhood can come here and use it under supervision.

4.2.2 The main building of the habilitation center

Everyday movement is one of the main Active Design strategies. The ground floor of the habilitation center is therefore dedicated to sports activities, including gym, spontaneous exercises, and pools. The indoor exercise area adjacent to the treatment gym is a more challenging and playful space than the gym area. The area has different levels of exposure both for people that don't want to train in an open area and for people who want to train in group classes or in a playful area with platforms, bridges, climbing nets, slides, swings, and a trampoline. Movement is also encouraged by a grand staircase that links the department floors. It is the first thing a person sees when entering the building and invites visitors to take the steps rather than the elevator. It reaches the same area as the elevators. Here visitors find an information point and sitting areas for waiting or resting. There are also other smaller staircases located in the dark core of the floors. They encourage patients and staff alike to use the steps

because they are conveniently placed and have attractive features along the way such as open play, exercise spaces, and greenery.

The building has one main entrance, and two other smaller entrances, to the gym area and the café. This allows different opening-hours for the gym and café which can be used independently from the healthcare facility, making these spaces available to the community.

An atrium is the core of the building with a design that reflects movement and spontaneity, to encourage people to enjoy their time in the building (Figure 4). The atrium is an important building feature and a meeting place for building users and the local community. It helps with orientation in the building and offers multiple sitting areas. For instance, seating for the café, seating for studying and reading in close connection to the library, and other smaller sitting areas arranged around greenery. The building has different types of meeting places with different characteristics and sizes that have visual or physical connection to the urban context. For example, several views to the outside greenery that are distributed to offer multiple socializing opportunities for patients, relatives, and staff. As well as two large open areas on floor 2 and 3 designed to enable spontaneous meetings, fun activities and active behavior. Here people can sit in different arrangements, more public or private, or they can exercise and play. Both have large glass-facades that allow views with positive distractions for visitors and staff. The area on floor 3 is designed for children and the department for children with autism. The open space here is an extension of the consultation rooms where children can play under supervision, while interacting with their family, in guided sessions.

Figure 4. Section illustrating the atrium and open areas

5. Discussion and Conclusion

This paper explores building design needs, strategies, and solutions for a new habilitation center that promotes active behavior of people with diverse abilities. The study identified several specific user needs, including interactions with the neighborhood and community, healthy environment and spaces that stimulate physical activity. The design proposal adopts a playful approach to incorporate habilitation throughout the building not only in gym areas but throughout circulation spaces. The design, therefore, focused on stimulating patients not only during their treatment sessions but also in the common areas of the building such as corridors and waiting rooms. During the process, it was particularly important to consider also the needs of caretakers and people leaving in the neighborhood. This paper presents the needs and requirements of habilitation centers in relation to healthy behavior and health equity, including solutions for movement, integration and socializing, in a democratic design accessible to everyone in the community. The results contribute to the design knowledge on habilitation centers specifically, and more generally healthcare building design. Moreover, the guidelines and strategies of Active Design were scrutinized from the perspective of patients that may have a mobility issue and the design proposal is focused on user experience. This study, therefore, advocates for incorporating guidelines for people with diverse abilities in Active Design principles.

The combination of Active and Inclusive Design strategies may improve access to healthcare, sense of community belonging, and healthy everyday lifestyles, for all types of people. This may lead to improved quality of life, less need for pain medication, fewer people that require acute medical care, and fewer resources needed for medical care, thus healthier and more sustainable communities.

The design solutions implemented in the design proposal presented in this paper test the feasibility of design strategies that consider healthcare as a lifelong health development while providing equal chances to everyone. They show that a habilitation center can be designed to promote an active lifestyle and become a place that helps all members of a society feel integrated and not marginalized because of medical conditions. The study indicates that design can have an active role in habilitation care when specific needs are explored. This may include the needs of patients, their caretakers, staff as well as the community. Moreover, the study displays that the design of a new habilitation center can also consider the health and wellbeing of the local community besides the usual focus of the diverse building users. The work thus indicates that the building design of a habilitation center can contribute to the SDG, particularly "Sustainable Cities and Communities" and "Good Health and Well-being".

Future research is needed to better understand the complexity of building design for habilitation centers, such as the in-depth study of specific user needs for habilitation, or the evaluation of certain active design solutions for people with diverse abilities.

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