

Clinic Redesign with the Patient in Context

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ABSTRACT

Background and aim – The objective is to develop the redesign of patient clinics by a living lab consisting of a multidisciplinary group of designers (interior design, facility design, organization design) and art students in participation with end-users and health care professionals at a Dutch university hospital.

Methods – Participatory research was conducted in multidisciplinary communities within the context of the hospital. Spatial design ideas are based on observations, site visits and interviews with various stakeholders.

Results – Four different themes or atmospheres have been created that can form the basis for further redesign of hospital wards. The spheres were: creating recharging possibilities for patients, creating delight at patients, seducing patient movements (inside out), and stimulating independency.

Originality – The living lab combines integrality, multidisciplinary, and participation with evidence-based design in a real-life context at a Dutch university hospital.

Practical or social implications – New designs, capable of having positive impact on patient health, are interesting for other hospitals and healthcare institutions. This allows them to combine prevention with cost reduction. Moreover, better buildings are also relevant for innovation and commercial purposes of the construction industries and for cost benefits for insurance companies.

Type of paper – Research paper.

KEYWORDS

Evidence-based design, patient clinic redesign, healing environment, living lab, multidisciplinary, participatory design.

INTRODUCTION

The living lab 'Patient in Context' focuses on spatial design ideas for the best clinical ward in a Dutch university hospital. The context of the living lab is a planned redesign of patient clinics. Results can be used for spatial-related field experiments and inspiration of professional clinical hospital designers and decision makers. The main focus of the experiments is a transformation from passive into active patient behaviours during hospital admission. The design should allow for flexibility to create different spatial clinical settings easily. Measurements will be multidisciplinary, linking architectural and organizational designs to medical outcomes.

LITERATURE STUDY

Nowadays single or multi-person hospital rooms have a standard interior, with prominent beds, bedside tables and television, which emphasizes being a patient. Patients show lack of activity and are mainly passive and only seem to react upon what healthcare professionals require. The spatial design, for instance, the prominent presence of a bed in these rooms, seems to be inextricably interwoven with patient inactivity (Annemans, 2015). Research shows that passiveness especially affects vulnerable patients. It may worsen their physical condition by affecting stress, sleep, infections, malnutrition, and loss of muscle mass. However, patient experiences in hospitals and their relationships with the environment are increasingly taken seriously. Applications of evidence-based design (EBD) in healthcare have grown rapidly in recent years. Studies indicate that well-designed physical settings play an important role in

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making hospitals safer and more healing for patients, and better places for staff to work in (Ulrich et al., 2008).

Thanks to studies on the ideal healthcare environment, like the “Fable hospital” (Sadler et al., 2011), new insights on the relationship between spatial design, patient health, and economic benefits have emerged. This living lab will have substantial benefits for society, because it can decrease healthcare costs. Costs related to poor designs can be avoided by introducing better designs of spaces, such as design properties that reduce patient falls, patient transfers, adverse drug events, health care-acquired infections, length of stay, nursing turnover, and staff injuries (Sadler et al., 2011). Application of established evidence-based innovations (e.g. Sadler et al., 2011; Ulrich et al., 2008) contributes to knowledge development and valorisation in the design world and medical world. Table 1 below shows effective design factors and respective healthcare outcomes.

Table 1 Effective design factors and healthcare outcomes.

Design factors	Healthcare outcomes
Access to daylight	1,2,3,4,5,6
Views of nature	1,3,4,5,6
Family zone (social interaction)	1,3,6
Improved wayfinding	3,6
Decentralisation of facilities	6

1. Reduced pain. 2. Improved patient sleep. 3. Reduced patient stress.
4. Reduced depression. 5. Reduced length of stay. 6. Increased patient satisfaction.

RESEARCH METHODOLOGY

The design process of the living lab is participatory and multidisciplinary in nature. Therefore, relevant stakeholders from various medical disciplines of the hospital are part of a participatory design process. The project is propelled by the arts, architecture, and facility management, and embedded in a research centre for built environment. The living lab uses arts and design as a game-changer for patient outcome. Designers and art students are able to critically explore the world through art and design and to represent, convey, and implement ideas in a functional and purposeful way. Working from multidisciplinary communities they search for unexpected combinations.

For this study, 14 students from different art disciplines, such as interior architecture, graphic design, fine arts, and facility management were supervised by an arts teacher, facility management teacher, and a healthcare researcher. The group spent a week in a pressure cooker to design the best hospital ward that stimulates active patient behaviours. Students spoke with experts from the hospital, employees, a few patients, and site visits and observations were made. Structured and unstructured methods were used (Tomitsch et al., 2018).

RESULTS

In the course of the project week, multidisciplinary working groups were formed on the basis of common interests around four emerging themes in initial design meetings and discussions with peers, teachers, and hospital staff. The four themes were: recharging, delight, inside-outside, and independency.

Recharging

The theme ‘Recharging’ is based on the biophilia theory. Designing healthcare buildings with nature has a therapeutic influence that has been transferred through evolution. Biophilic design has a positive effect on the length of stay and satisfaction of the patient. For instance, patients exposed to nature and sunlight have a shorter post-operative stay, better emotional well-being and less complications such as headache and nausea. Gardens also have the advantage of promoting social interaction. Design groups involved in ‘Recharging’ proposed to use the balconies in the inner street on each floor differently, by converting them into indoor gardens. By connecting the gardens with stairs, ‘Recharging’ aimed to

stimulate movement and interaction and to seduce patients to increase their own mobility. On the roof a roof garden was imagined, where one can enjoy fresh air and daylight.

Delight

‘Delight’ design groups aimed to get patients out of their rooms by creating an attractive central meeting area. This was done by using nudging factors, such as daylight, comfort, and facilities for daily actions. More daylight responds to our biological needs, has a positive effect on sleep, depression and pain relief and ensures a shorter and better recovery. Daylight is better utilized by placing facilities that do not require daylight- such as the bathroom- in the middle section, and by increasing transparency. An attractive open meeting space sought to create delight at patients and staff. For instance, this space at the building facade tempts you to meet family or other patients, cook or eat a meal, play a game, or read a book (see Figure 1 below).

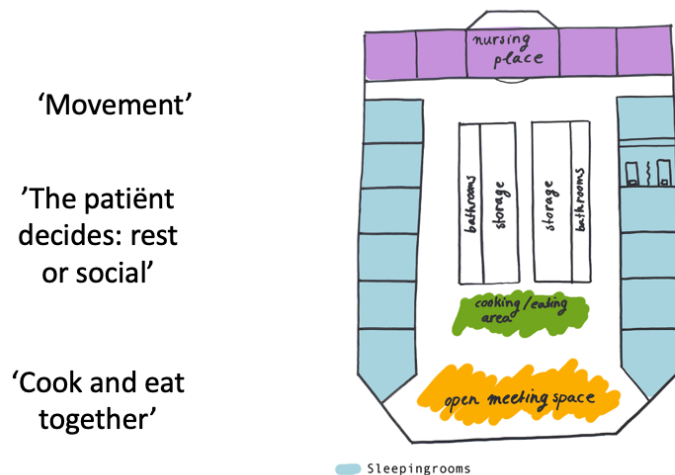


Figure 1 Imagined new floorplan.

Inside outside

‘Inside-Outside’ proposes to ‘reverse’ the design of the department. Rooms are reduced to simple single rooms. There is a central cooking and dining facility for patients who are not confined to bed. In this way, staff can better monitor whether patients are eating their meals which prevents malnutrition, and patients are seduced to exercise and interact socially. Staff is not placed at the corners of the building, but in the middle of the department. This allows an optimal view of patients and rooms. Transforming the inner street of the hospital into a horizontal park increases the patient’s room to move (see Figure 2). By austerity of the room, creating places for daily activities and adding nature, physical activity and social interaction are stimulated, which may potentially contribute to a shorter stay.

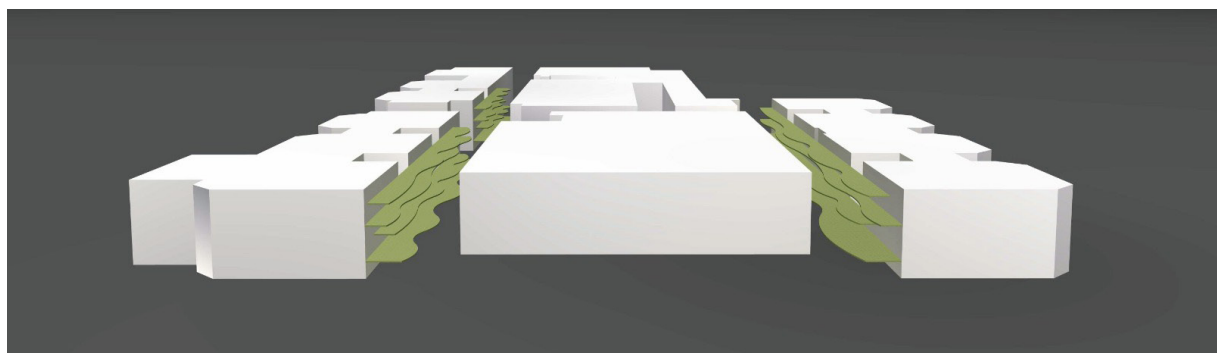


Figure 2 Imagined horizontally connected balconies.

Independency

High quality wayfinding in a hospital environment can avoid stressful situations. People do not get lost. Good design and signage inform people about a destination. This allows them to relax during their wayfinding task. In this context, our student-designers have proposed to improve wayfinding through icons.

'Independency' of patients is stimulated with wearables that allow them to stay independent of place and time. In this line of thought wearables form the link between doctor, nursing staff, the patient, and the context. It communicates, for example, when the doctor or nursing staff is ready to meet the patient at the ward. With the wearable, waiting is transformed into possible exploration of hospital spaces, a more relaxed attitude, and increased well-being.

DISCUSSION

With their design ideas, a new generation of upcoming designers has shown how- in their view- patient activity can be stimulated. For instance, by applying with sensory experience and daily needs. By doing so, attention is paid to both the physical and mental condition of the patient. If we want to indicate the essence of these ideas, it is striking that they are organized over the aesthetic and the functional axe. The aesthetic axe depicts visual contrast between attractive common areas and less attractive private areas, making common areas function like a magnet, and by doing so, creating traffic. Moreover, the functional axe emphasizes the organizational contrast between plain facilities in the private area and luxurious facilities in the common area. By moving along the axis of aesthetics and functionality, researchers can apply these in small-scale interventions and collecting evidence about its impact on patients' health and recovery. This approach should allow future designers and facility managers to apply evidence-based knowledge during the design process enriching hospital buildings.

A future living lab applying these proposed and related interventions in a real-life context will have the advantage of valorisation and application. Especially, through an involvement of medical specialists. With their help, in a living lab the impact of theoretically proposed design properties on patient health can be tested in practice. In case of clear positive relations with patient outcomes, it can be replicated in other healthcare settings. EBD is a developing field of study that holds great promise, for patients, their beloved ones, and healthcare staff. The multidisciplinary approach creates new possibilities for designs that have an impact on the real world. Hence, it is expected that the design of the living lab and the related outcomes can be transferred to other healthcare settings, and by doing so, activate patients and advance their health.

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Deltapremie

The 'Deltapremie' or Delta Prize is a new leading research prize in the Netherlands focusing on practice-oriented research by professors. The prize is developed for professors who have managed to repeatedly make a special difference with the social impact of their research over the years. It shows where practice and research can come together in an innovative way. Practice-oriented research has acquired a solid place in Dutch society. Almost 700 professors and more than 3,000 teacher-researchers are currently involved. The starting point of the research is always to find solutions for practice-based problems, also by partnering with practice. In this way, practice-oriented research provides applicable solutions to societal challenges.



An independent selection committee selected the winners. The committee consisted of six experts from Erasmus University Rotterdam, Innofest, Delft University of Technology, Netherlands Study Centre for Technology Trends, and the Association of Netherlands Municipalities. In the report the selection committee tributes Mark Mobach and his research group for the impact that they have on the crossroads of various domains from public transport to mental health. Mobach: "We see the prize as enormous encouragement to continue our research into space and organisation in healthcare, education, offices, and cities together with our partners. We extend our research to areas where there are perhaps fewer financial possibilities, such as research with the arts and frailty."

Research focus area

With his research group, Prof. Mobach wants to contribute to the best buildings for people and organisations. He does so by devising better space and services in a multidisciplinary setting together with students, lecturer-researchers, Ph.D.-students, and postdocs. Better spaces and services for education, offices, and even cities that stimulate healthy behaviour, better healthcare buildings that reduce stress, but also prisons and stations that better meet the needs of society.