

Walls that Heal: A Decade of Murals and the Rehumanization of Hospital Space in Croatian Healthcare Environments

Melinda Šefčić^{1,2}

¹ Croatian Association of Fine Artists (HDLU), Zagreb, Croatia

² Academy of Fine Arts, University of Zagreb, Croatia

³ Department of Ophthalmology, University Hospital Centre, 31000 Osijek, Croatia

OPEN ACCESS

Correspondence:

Melinda Šefčić
sefcicmelinda30@gmail.com

This article was submitted to RAD
CASA - Medical Sciences
as the original article

Conflict of Interest Statement:

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 22 November 2025

Accepted: 15 December 2025

Published: 28 December 2025

Citation:

Šefčić M. Walls that Heal: A Decade of Murals and the Rehumanization of Hospital Space in Croatian Healthcare Environments
569–72-73 (2025): 30–31
DOI: 10.21857/y14okfkjv9

Copyright (C) 2025 Šefčić M. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.

ABSTRACT

Background

Hospital environments significantly influence how illness is perceived and experienced. Research in environmental psychology and arts in health shows that colour, nature-based imagery and coherent visual design can reduce stress and support emotional regulation. Croatia's first systematic research on hospital murals began with the doctoral dissertation Rehumanization and Reaestheticization of Hospital Space (2016–2018) and continued through a decade of mural projects (2016–2025). This article synthesises these findings to examine how murals rehumanize hospital space.

Methods

A convergent mixed-methods design was applied. Quantitative components included pre–post questionnaires in a phoniatics waiting room (17 respondents before; 41 after) and a multi-hospital study with 95 respondents (2018–2019). Qualitative components included systematic observation, structured conversations with patients, parents and staff, and an artist-researcher diary documenting mural projects from 2016 to 2025. Data were analysed descriptively and thematically around comfort, distraction, orientation and communication.

Results

Before interventions, interiors were described as sterile, monotonous and poorly adapted to children. In the doctoral study, 94.1% anticipated positive effects of a mural; after implementation, 92.7% rated it aesthetically successful, and 87.8% perceived improved comfort. In the multi-hospital study, around two-thirds noted reduced “emptiness” and more than 90% supported expanding mural practice. Later observational data recorded calmer children, shorter crying episodes and spontaneous use of murals for wayfinding and communication.

Conclusions

Across ten years, murals consistently acted as emotional regulators, positive distractions and spatial anchors. Aligned with European and WHO culture–health frameworks, these findings support integrating murals into hospital planning and care design.

KEYWORDS: art in hospitals; murals in hospital; positive distraction; rehumanization; healing environments

SAŽETAK:

ZIDOVİ KOJI LIJEČE: DESETLJEĆE MURALA I REHUMANIZACIJA BOLNIČKOG PROSTORA U HRVATSKOM ZDRAVSTVENOM SUSTAVU

Pozadina

Bolničko okruženje značajno utječe na to kako se bolest doživljava i proživljava. Istraživanja iz područja psihologije okoliša te umjetnosti u zdravstvu pokazuju da boja, prizori temeljeni na prirodi i koherentan vizualni dizajn mogu smanjiti stres i poduprijeti emocionalnu regulaciju. Prvo sustavno istraživanje bolničkih murala u Hrvatskoj započelo je doktorskom disertacijom *Rehumanizacija i reestetizacija bolničkoga prostora – primjer likovnoga rješenja jednoga bolničkoga odjela* (2016.–2018.) te se nastavilo kroz desetljeće muralnih projekata (2016.–2025.). Ovaj članak sintetizira ta saznanja kako bi ispitalo na koji način murali rehumaniziraju bolnički prostor.

Metode

Primijenjen je konvergentni mješoviti istraživački dizajn. Kvantitativne komponente uključivale su pre–post upitnike u čekaonici fonijatrije (17 ispitanika prije; 41 nakon) te višebolničko istraživanje s 95 ispitanika (2018.–2019.). Kvalitativne komponente obuhvatile su sustavno opažanje, strukturirane razgovore s pacijentima, roditeljima i osobljem te dnevnik umjetnice-istraživačice koji dokumentira muralne projekte od 2016. do 2025. Podaci su analizirani deskriptivno i tematski, s naglaskom na ugodu, distrakciju, orijentaciju i komunikaciju.

Rezultati

Prije intervencija, interijeri su opisivani kao sterilni, monotoni i slabo prilagođeni djeci. U doktorskom istraživanju 94,1% ispitanika očekivalo je pozitivne učinke murala; nakon izvedbe 92,7% ocijenilo je mural estetski uspješnim, a 87,8% je navelo poboljšanu ugodu. U višebolničkom istraživanju oko dvije trećine ispitanika primijetilo je smanjeni osjećaj „praznine“, a više od 90% podržalo je širenje muralne prakse. Kasniji opažajući podaci bilježe mirniju djecu, kraće epizode plača te spontano korištenje murala za snalaženje i komunikaciju.

Zaključak

Tijekom deset godina murali su se dosljedno pokazali kao emocionalni regulatori, pozitivne distrakcije i prostorni orijentiri. U skladu s europskim i WHO okvirima kultura–zdravlje, rezultati podupiru integriranje murala u planiranje bolnica i dizajn skrbi.

KLJUČNE RIJEČI: umjetnost u bolnicama; murali u bolnicama; pozitivna distrakcija; rehumanizacija; iscjeljujuća okruženja

1. BACKGROUND

Hospitals are not only technical infrastructures for diagnosis and treatment; they are lived environments that shape how illness, vulnerability and care are experienced. A substantial body of research in environmental psychology and arts in health has demonstrated that visual stimuli, light, colour and access to nature can influence stress, pain perception and recovery trajectories (Appleton, 1975; Kaplan & Kaplan, 1989; Ulrich, 1984, 1991; Fancourt & Finn, 2019). Nature-based imagery and carefully designed interiors have been associated with lower physiological arousal, improved mood and a greater sense of safety, particularly in sensitive contexts such as paediatrics and oncology. Within this wider field, visual art in hospitals has moved from being considered an optional embellishment to a recognised component of evidence-based design. Reviews of hospital art programmes in the United Kingdom and elsewhere highlight benefits for patients, visitors and staff, including reduced anxiety,

improved orientation and enhanced communication (Lankston et al., 2010; Moss, 1987; Stuckey & Nobel, 2010). Contemporary frameworks, such as evidence-based art guidelines, emphasise positive distraction, emotional safety and cultural relevance as key criteria for visual interventions in healthcare settings. At the policy level, European and international documents increasingly position culture as a determinant of health. The WHO regional scoping review on arts and health (Fancourt & Finn, 2019) and the European Commission's report *Culture & Health – Time to Act* (OMC Working Group, 2025) call for systematic integration of artistic practice into health systems. These frameworks underline that the arts can contribute not only to individual well-being, but also to patient-centred care, staff morale and community engagement with health institutions. Murals are particularly powerful within this context. As large-scale, site-specific and durational works integrated into architec-

ture, they influence both the atmosphere and legibility of hospital space. Because they occupy entire surfaces, murals can act as orientational landmarks (“turn right at the forest wall”), supporting wayfinding and reducing stress in complex hospital layouts (Carpman & Grant, 1993; Rangel & Mont’Alvão, 2011). At the same time, they can provide “positive distraction” – visual narratives that gently shift attention from pain, fear and uncertainty towards curiosity and imaginative engagement (Ulrich, 1991). In Croatia, systematic research into art in hospital space began with the doctoral dissertation *Rehumanization and Reaestheticization of Hospital Space – An Example of Artistic Intervention in a Hospital Department*, defended at the Academy of Fine Arts, University of Zagreb (Šefčić, 2018). The doctoral case study transformed a phoniatics waiting room at University Hospital Centre Zagreb (Rebro Hospital) with a large nature-based mural and evaluated its effects on patients, parents and staff using pre-post surveys and qualitative observation.

This doctoral work introduced the concepts of *rehumanization* and *reaestheticization* as ethical and aesthetic frameworks for hospital art. Rehumanization refers to interventions that acknowledge and respond to human vulnerability through care for the sensory, emotional and social dimensions of space. Reaestheticization emphasises the transformation of hospital environments from sterile or monotonous settings into spaces of quality, coherence and visual meaning. In the author’s forthcoming book *Walls that Heal: Murals and the Rehumanization of Hospital Space*, these concepts are further articulated as a bridge between artistic practice and research-based evaluation.

Building on the doctoral project, more than 150 mural interventions were implemented in Croatian hospitals between 2016 and 2025/2026, realised independently or in collaboration with the Croatian Association of Fine Artists (HDLU) and the Academy of Fine Arts in Zagreb, where Šefčić teaches the course *Aestheticization of Public Space with Art*.

The core projects conducted between 2016 and 2025/2026 include:

- **Aestheticization and Rehumanization of Hospital Space: Art as Therapy** (2016–2017, EU project CreArt)
- **Aestheticization and Rehumanization of Hospital Space: Art for Health** (2018–2019)
- **Aestheticization of Hospital Space: Art for Health** (2019–2020)
- **Colorful World** (2022)
- **Colorful World 1** (2023)
- **Colorful Hospital** (2024)
- **Colorful Hospital 1** (2025–2026)

These programmes progressively expanded the range of departments, from phoniatics to paediatrics, oncology, maternity wards and transitional spaces such as corridors, staircases and connecting passages.

Across all projects, the central questions were:

1. How can murals rehumanize hospital spaces for specific patient groups?
2. In what ways do murals function as positive distraction, emotional support and non-verbal communication?
3. How do patients, parents/caregivers and staff perceive changes in comfort, mood, orientation and social interaction after mural interventions?
4. How can practice-based artistic work be systematically evaluated and translated into design principles?

The aim of this article is to synthesise ten years of practice-based research on murals in Croatian hospital environments and situate these findings within international arts-in-health discourse. The focus is on analogue mural painting walls, colour and narrative as a form of “healing art” that operates at the intersection of aesthetics, ethics and care.

2. RESEARCH APPROACH AND METHODOLOGY

2.1. Research aims

The research programme pursued the following aims:

1. To examine the effects of mural interventions on perceived comfort, mood and emotional safety in hospital spaces.
2. To explore how murals act as tools of positive distraction and non-verbal communication for patients, parents and staff.
3. To analyse the role of murals as spatial anchors that support orientation and wayfinding.
4. To document patient, caregiver and staff perceptions of mural interventions and the extent to which they support rehumanization and aestheticization of hospital space.
5. To develop principles for evidence-informed mural practice in healthcare environments.

2.2. Overall research design

The programme is grounded in a practice-based and interdisciplinary methodology in which artistic work constitutes both the object and the method of inquiry (Camic & Clift, 2011). Murals are conceptualised simultaneously as:

- aesthetic artefacts integrated into hospital architecture,
- instruments of observation that reveal patterns of movement, pausing and interaction, and
- triggers for conversation that generate feedback from hospital users.

A convergent mixed-methods design was adopted, combining quantitative surveys with qualitative observation and reflection. This allowed numerical data to be interpreted in relation to lived experience.

QUANTITATIVE COMPONENTS

1. Doctoral case study (phoniatics waiting room, University Hospital Centre Zagreb)

- Pre-intervention survey: 17 respondents (5 staff, 6 patients, 6 parents/visitors).
- Post-intervention survey: 41 respondents (10 staff, 19 patients, 12 visitors).
- Questionnaires included demographic data and items on spatial perception, emotional responses, awareness of art in hospitals and expectations regarding mural impact.

2. Multi-hospital project: The Aestheticization and Rehumanization of Hospital Space: Art as Therapy (2018–2019)

- 95 respondents across ten hospital spaces in three hospitals: University Hospital Centre Zagreb (Rebro Hospital), Clinical Hospital for Women's Diseases and Obstetrics, and Clinical Hospital for Children Zagreb.
- Anonymous questionnaires collected before and after mural interventions between February and August 2019.
- Items focused on comfort, perception of interior design, attitudes towards aesthetic redesign and support for art interventions.

Quantitative data were analysed using descriptive statistics (frequencies, percentages, means) in SPSS. Given the modest sample sizes and the use of convenience sampling, more complex inferential statistics were not applied.

QUALITATIVE COMPONENTS

- Systematic field observation of behaviour in waiting rooms, corridors and wards during and after mural implementation (e.g. where people sit, how they move, how long they look at the walls).
- Informal but structured conversations with patients, parents/caregivers and staff, focusing on impressions of the space, emotional responses and suggestions for improvement.
- An artist–researcher diary (2016–2025/2026) documenting spatial conditions, light and colour, emotional atmosphere, and verbal comments encountered during project work.
- Group feedback sessions with staff at the end of larger projects, particularly in the later *Colorful World* and *Colorful Hospital* cycles.

Qualitative material was thematically coded with particular attention to the following categories: positive distraction, comfort, orientation, social interaction, narrative engagement, and perceived identity of the space.

Triangulation between surveys, observations and diary entries strengthened the credibility of findings and enabled a nuanced understanding of how murals operate in everyday hospital life.

2.3. Research sites and mural projects (2016–2025/2026)

The research programme encompassed more than fifteen units across several hospitals, including:

- **University Hospital Centre Zagreb (Rebro Hospital)** – Phoniatics Department; Paediatrics; Neonatology; Oncology; corridors and transitional spaces.
- **Clinical Hospital for Women's Diseases and Obstetrics, Zagreb** – maternity-related wards and waiting areas.
- **Clinical Hospital for Children Zagreb** – paediatric clinics and play-oriented spaces.
- **Sisters of Charity Clinical Hospital Centre – Oncology Clinic** – oncology wards and corridors.

The empirical core of this article is formed by the following mural projects:

1. Aestheticization and Rehumanization of Hospital Space: Art as Therapy (2016–2017)

Pilot murals at University Hospital Centre Zagreb (Rebro Hospital) were realised within the EU project CreArt. Large-scale, nature-based imagery was introduced into corridors and waiting rooms to explore how colour and narrative affect emotional atmosphere.

2. Doctoral case study: *Rehumanization and Reaestheticization of Hospital Space – An Example of Artistic Intervention in a Hospital Department*, Phoniatics waiting room, University Hospital Centre Zagreb (2017–2018)

A single waiting room was transformed using a continuous wall mural depicting a stylised forest and animal world designed for children and their families (Šefčić, 2018). This case study provided the most detailed pre–post survey data.

3. Aestheticization and Rehumanization of Hospital Space: Art for Health (2018–2019)

A multi-site project across three hospitals, with murals in ten hospital spaces. This study systematically examined perceptions before and after mural interventions using anonymous questionnaires and produced a rich narrative report on patient and staff responses.

4. Aestheticization of Hospital Space: Art for Health (2019–2020)

Follow-up murals targeting additional wards and corridors, with emphasis on continuity of colour and wayfinding across entire floors.

5. Colorful World (2022) and Colorful World 1 (2023)

Mural cycles in child-oriented units, funded by the Ministry of Culture and Media of the Republic of Croatia, in 2023. The projects used bright yet harmonised colours and narrative sequences to create “worlds” that children could visually explore.

6. Colorful Hospital (2024) and Colorful Hospital 1 (2025)

Large-scale programmes funded by the Ministry of Culture and Media and aimed at integrating murals into hospital spatial strategies, with particular attention to corridors, waiting rooms and transitional areas. These projects further embedded mural practice into institutional planning processes.

2.4. Participants and data collection

Three main participant groups were involved:

- **Patients** – children and adults in waiting rooms and wards.
- **Parents and caregivers** – particularly in paediatric and maternity units.
- **Healthcare staff** – physicians, nurses, technicians and administrative staff.

DOCTORAL STUDY (PHONIASTRICS WAITING ROOM)

In the predissertation phase (June 2017), 17 respondents completed the pre-intervention questionnaire: 5 staff, 6 patients and 6 parents/visitors. Four participants were male and 12 female, with one non-response; year of birth ranged from 1952 to 2002. In the post-intervention phase (October–November 2017), 41 questionnaires were collected: 10 staff, 19 patients and 12 visitors. Seven respondents were male and 32 female; birth years ranged from 1946 to 1994.

The pre-intervention questionnaire included 13 questions, mostly closed (Yes/No and multiple-choice), with a small number of open items. The post-intervention questionnaire consisted of 10 questions, combining closed-format items with four open questions about perceived effects of the mural.

MULTI-HOSPITAL PROJECT (2018–2019)

The study used a convenience sample of 95 respondents before and after mural interventions across ten wards. The respondents were distributed among employees, patients and visitors, and represented diverse age and educational profiles. As the authors note in the project report, pragmatic constraints in paediatric and maternity wards (acute health issues, high turnover, one-time stays) limited the achievable sample size and restricted possibilities for more complex statistical analysis.

LATER PROJECTS (2019–2025/2026)

In *Aestheticization of Hospital Space: Art for Health, Colorful World, Colorful World 1, Colorful Hospital and Colorful Hospital 1*, formal surveys were not repeated. Instead, evaluation relied on systematic participant observation, regular conversations with users during and after painting, and feedback meetings with staff. Across these projects, feedback from patients, parents/caregivers and staff was consistently and overwhelmingly positive; no participant expressed rejection of the murals.

2.5. Ethical considerations

Ethical approval for the doctoral research at University Hospital Centre Zagreb was obtained from the hospital Ethics Committee at its 8th session on 16 May 2017, approval no. 02/021 AG. The study was assessed as consistent with ethical principles. For the multi-hospital study (2018–2019), ethical approval was not required because the questionnaires were anonymous and conducted as part of routine programme evaluation, with no col-

lection of identifiable personal data. For the later observational projects (2019–2025/2026), no formal ethical approval was required according to institutional guidelines, as no identifiable information was recorded and participation was entirely voluntary and non-intrusive.

All surveys were anonymous. Adult participants and parents or guardians of minor participants provided written informed consent. In later projects, verbal consent was obtained for informal interviews, and no identifying data were recorded. The research adhered to the principles of the Declaration of Helsinki and institutional guidelines.

2.6. Analytical framework

Data were interpreted through an integrative framework that brings together:

- **Stress-reduction theory** (Ulrich, 1991), which postulates that certain environmental features can reduce physiological arousal and stress.
- **Attention restoration theory** (Kaplan & Kaplan, 1989), focusing on the restorative potential of “soft fascination” in nature-like environments.
- **Biophilic design** (Wilson, 1984), emphasising innate human affinity for nature and its relevance in built environments.
- **Arts-in-health perspectives** that foreground well-being, participation and relational aesthetics (Camic & Clift, 2011; Lankston et al., 2010; Stuckey & Nobel, 2010).

Murals were evaluated not only as individual artworks but as components of a “healing environment”: a spatial configuration that supports safety, orientation, emotional regulation and a sense of dignity.

3. RESULTS

3.1. Pre-intervention perceptions in the doctoral case study

Before the mural intervention in the phoniastics waiting room, respondents described the space as white, plain and only minimally adapted to children. Quantitative data confirmed this perception:

- **Perceived need for change.** 64.7% of respondents stated that some change in the waiting room was needed, while 23.5% did not see the need for change; 11.8% did not answer.
- **Child friendliness.** 52.9% felt that the space was not adapted to children, compared to 41.2% who believed it was.
- **Potential for improvement.** 88.2% thought the space could look better; only 5.9% replied negatively.
- **Spatial definition.** When asked to characterise the waiting room, 30% defined it as “uninteresting”, 15% as “empty”, 10% as “sterile”, while only 5% chose “cheerful”; 30% described it as “pleasant” but still visually unengaging.

Although a majority had not previously reflected on interior

design, 58.8% reported never thinking about the spatial arrangement, 88.2% nonetheless considered spatial design important. This indicates an implicit awareness of the significance of the environment, even when it is not explicitly articulated.

REGARDING CHILDREN'S EXPERIENCE:

- 47.1% believed that children felt good in the waiting room despite illness, while 41.2% believed they did not; 11.8% abstained.
- 52.9% felt that children were *not* satisfied with the space; only 23.5% considered them satisfied.
- In open responses, several participants noted that “nothing in particular” occupied children’s attention, except a small area of children’s drawings near a speech therapist’s office.

Awareness of art in hospital settings was relatively high:

- 94.1% believed that a visual arts intervention would have a positive effect on children (and accompanying adults) during waiting.
- 76.5% already knew that visual interventions in hospital spaces can contribute to well-being, positive distraction and motivation for children’s creative expression.
- All 17 respondents (100%) considered the proposed mural design appropriate for the space and children and supported the initiative.

These findings supported the initial hypothesis that there was both a need and a desire for aesthetic and therapeutic transformation of the waiting room.

3.2. Post-intervention outcomes in the doctoral case study

After the mural was installed as illustrated in Figure 1, almost all respondents noticed the change:

- 95.1% reported paying attention to the altered appearance of the waiting room.
- 92.7% rated the mural as aesthetically good or exceptionally good, with 68.3% selecting “exceptionally good”; only one respondent rated it as “very poor”.
- 87.8% believed that children and patients now felt better in the space, confirming the hypothesis that visual interventions can contribute to emotional well-being.

In relation to positive distraction:

- 90.2% felt that the mural captured their attention.
- Respondents frequently reported that the mural shortened waiting time, that they studied the “animal kingdom” and searched for meaning in the composition, and that the work helped to “shift attention in a positive direction”.
- In a multiple-choice question about effects, 22.6% selected “shortened waiting time”, 22.6% “studied the animal world and looked for meaning”, 22.6% “felt more relaxed”, and 32.3% “helped me to divert my attention in a positive direction”. Many selected more than one effect.

As regards social dynamics:

- 70.7% noticed that children, patients and visitors commented on the mural.
- Qualitative comments revealed that children were “enthusiastically looking” at the image, “searching for animals”, and that parents/caregivers frequently used the mural to initiate conversation (“Which animal do you like most?”).
- Positive descriptors such as “beautiful”, “colourful”, “lively”, “humanised” and “like entering another world” were common. A small number of respondents commented critically on the density of detail, demonstrating engaged, rather than indifferent, viewing.

Finally, 95.1% of respondents supported similar aesthetic interventions in other hospital departments. When asked where such murals would be appropriate, respondents frequently mentioned paediatrics, oncology and other high-stress units, indicating awareness of the broader potential of this approach.

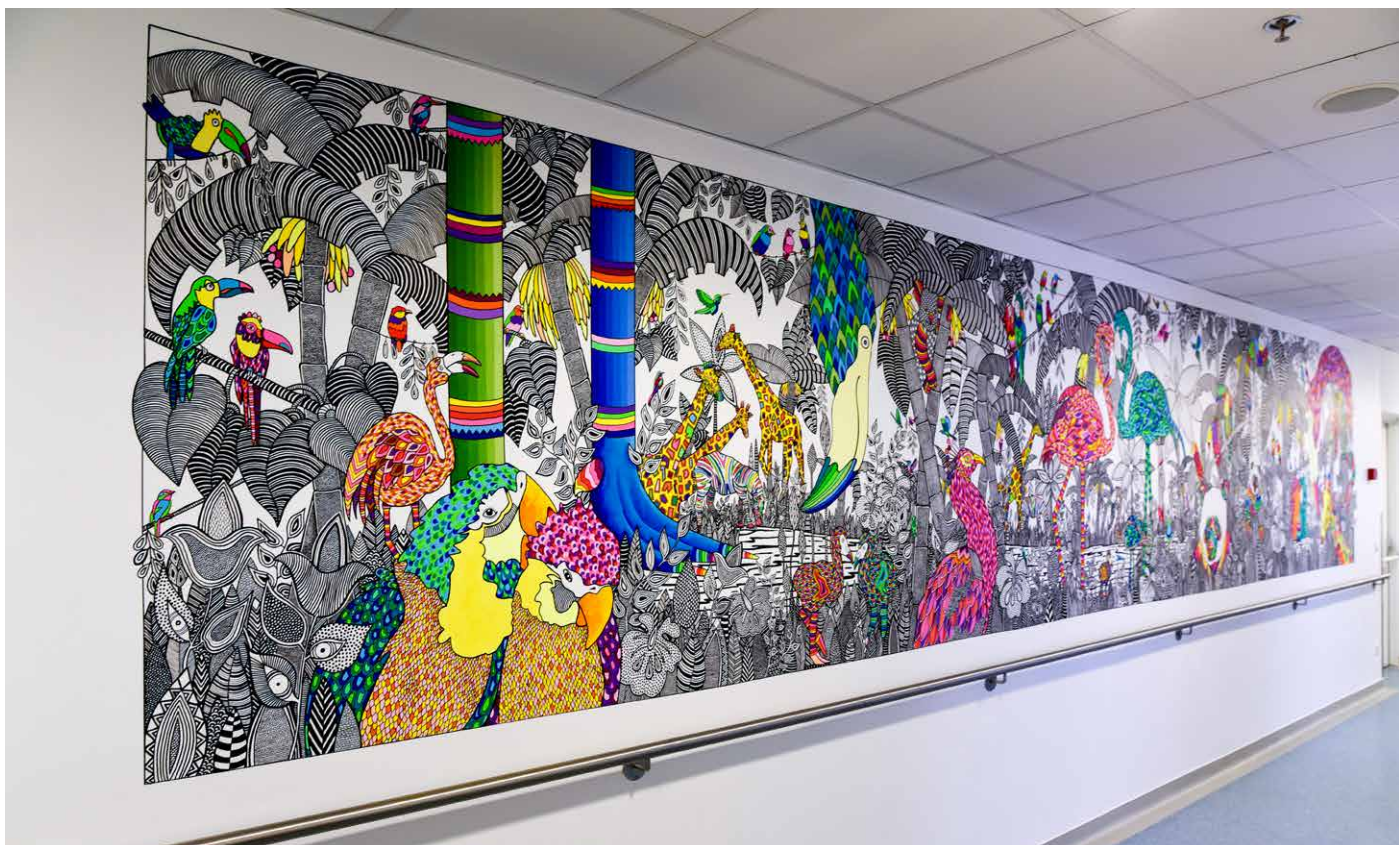


Figure 1. *Nature Viewed in a Different Way* by Melinda Šefčić (2017), mural in the Phoniatics waiting room (University Hospital Centre Zagreb, Rebro Hospital).
Photographer: Juraj Vučlač. Reproduced with permission of the artist.

3.3. Multi-hospital study: Aestheticization and Rehumanization of Hospital Space: Art for Health. The multi-hospital project extended mural practice to ten wards at University Hospital Centre Zagreb - Rebro Hospital, the Clinical Hospital for Women's Diseases and Obstetrics, and Clinical Hospital for Children Zagreb. Anonymous surveys were collected before and after visual interventions between February and August 2019.

Key results included:

- **General comfort in hospital environments.** Both before (68.57%) and after (65.87%) the mural interventions, the majority of respondents reported feeling comfortable or extremely comfortable in the hospital environment. Around 16–21% could not assess their comfort level.
- **Perception of hospital interiors.** Respondents characterised the environment as “uninteresting” (around one third both before and after), “comfortable” (35.71% before; 49.06% after), and “full of content and interesting” (23.8% before; 13.2% after). Negative descriptors (“empty”, “repulsive”) were less frequent and did not show dramatic shifts, partly reflecting the fact that the study was conducted in relatively well-maintained wards.
- **Attention to interior design.** Nearly two-thirds (64.28%) of respondents had thought about interior design before the interventions, and a very similar proportion (64.15%) noticed changes in the feeling of space after murals were installed. Around 90%, both before and after, considered interior design important for their hospital experience.
- **Attitudes towards visual art interventions.** Before implementation, 90% of respondents reacted positively to the idea

of visual art interventions in hospitals (73.81% thought it was a good idea; 16.67% believed it was “absolutely necessary”). After implementation, 79.25% still considered it a good idea and 9.43% “absolutely necessary”, with only a small proportion undecided.

- **Perceived impact on comfort.** More than 90% of respondents before and after the interventions agreed or fully agreed that visual art interventions positively contributed to comfort during hospital stays. Only one respondent in each phase explicitly disagreed.
- **Support for wider implementation.** Of the 95 participants, 93.68% supported the initiative to paint other hospitals in Croatia; only five had no opinion, and just one respondent did not support it. This strong endorsement is notable given that the sample included staff, patients and visitors with varied backgrounds.

Demographic data showed that:

- All age groups were included, with a prominence of younger adults due to the nature of paediatric and maternity wards.
- Educational levels ranged from incomplete primary school (children) to postgraduate degrees, with the largest group having completed secondary or vocational education.
- Most respondents were from Zagreb and surrounding regions, reflecting the location of the hospitals.

Although limited by sample size and convenience sampling, the study confirmed that murals were widely accepted, perceived as beneficial, and considered important enough to merit expansion to other institutions, with Figure 2 and Figure 3 presenting visual examples of murals created within the multi-hospital project.



*Figure 2. Tree of Life by Ivan Stanišić (2019), Neonatology Ward (University Hospital Centre Zagreb, Rebro Hospital).
Photographer: Ivo Kosanović. Reproduced with permission of the artist.*



*Figure 3. Blue Notes by Ivo Kosanović (2019), Inter-Building Corridor (University Hospital Centre Zagreb, Rebro Hospital).
Photographer: Ivo Kosanović. Reproduced with permission of the artist.*

3.4. Observational findings from later projects (2019–2025/2026)

In later cycles—*Aestheticization of Hospital Space: Art for Health, Colorful World, Colorful World 1, Colorful Hospital and Colorful Hospital 1*—evaluation relied on systematic observation and conversational feedback rather than formal surveys. Several recurring patterns emerged:

- **Calmer children and reduced visible distress.** Nurses and physicians repeatedly reported that children were less restless in newly painted waiting rooms, with loud crying being less frequent or shorter in duration. In some units, staff commented that children seemed to arrive “a little earlier” to appointments, keen to “see the wall again”.
- **Positive distraction and ritualised viewing.** Children often developed rituals around the murals: counting animals, choosing “favourite characters”, inventing stories or “checking” whether something had changed. These behaviours were observed to occupy waiting time and shift focus from medical procedures.
- **Support for communication.** Staff used mural elements as tools to approach anxious children (“Which animal are you today?”, “Shall we walk with the giraffe to the room?”). Par-

ents used the murals to explain procedures or distract from fear (“We will go past the balloons and then the doctor will listen to your voice”).

- **Wayfinding and spatial identity.** Murals quickly became informal landmarks: families and staff referred to “the corridor with the forest” or “the wall with the violet flowers”. This aided orientation in otherwise similar corridors and reinforced a sense of identity for specific wards.
- **Pride and ownership.** Staff often referred to “our wall” and requested additional mural work or extensions. Some departments expressed pride when visitors commented on the artwork, perceiving it as a sign that their ward was cared for and valued.
- **Community visibility.** Parents/caregivers and visitors took photographs in front of murals and shared them on social media, transforming parts of the hospital into recognisable visual symbols rather than anonymous transit zones.

Importantly, across all observed sites, there were no reports of rejection or discomfort due to the murals. Occasional critical comments (e.g. preference for fewer details or different colours) were exceptions that confirmed active engagement rather than passive acceptance. Figures 4 and 5 present examples of later mural interventions cited in these observational findings.

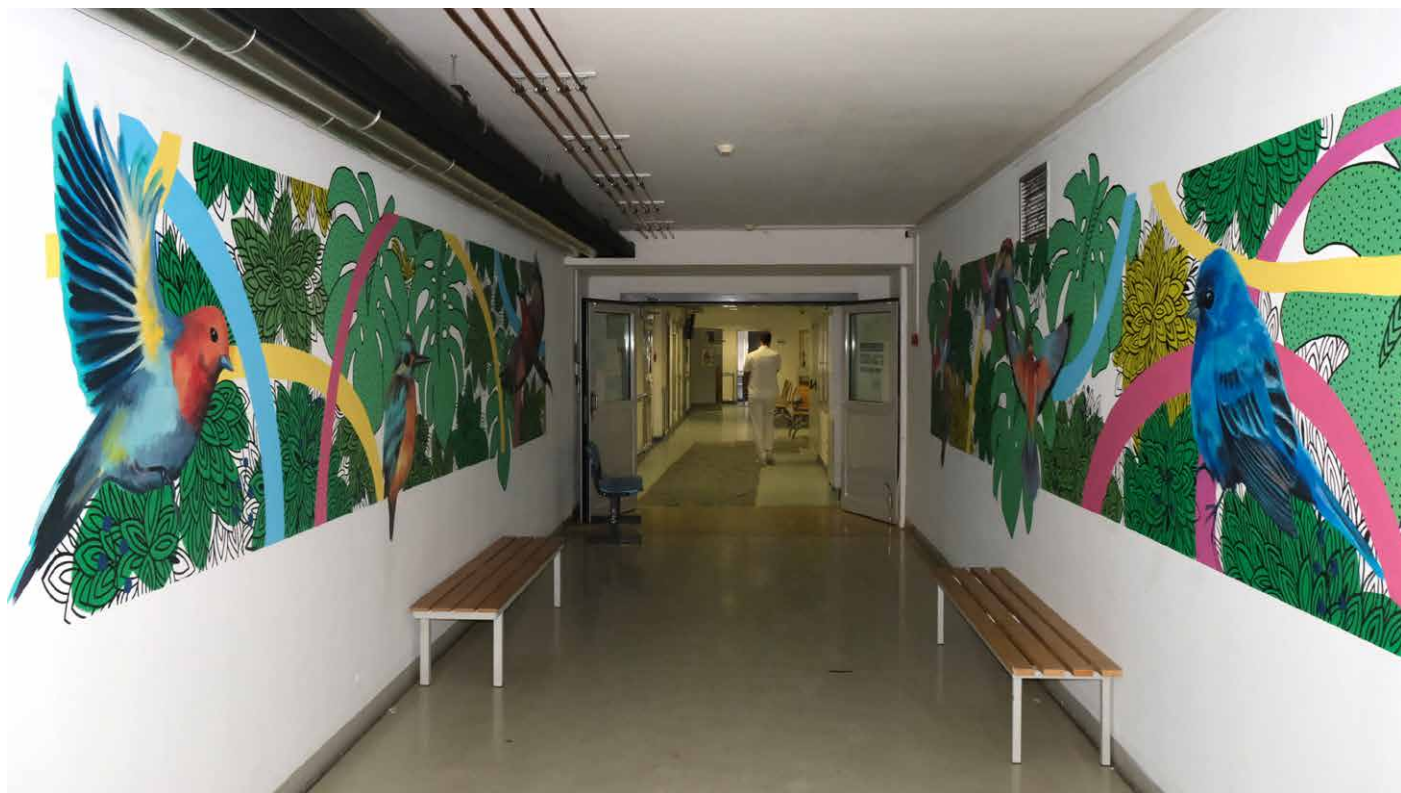


Figure 4. *Smile* by Melinda Šefčić and Valentina Supanz Marinić (2024), Clinic for Oncology, Radiology Unit (University Hospital Centre Zagreb, Rebro Hospital). Photographer: Marko Dajak. Reproduced with permission of the artists.

4. DISCUSSION, CONCLUSIONS AND IMPLICATIONS

4.1. Murals as an infrastructure of care

The findings from ten years of practice-based research support a view of murals as part of hospital care infrastructure, not as decorative add-ons. They contribute to:

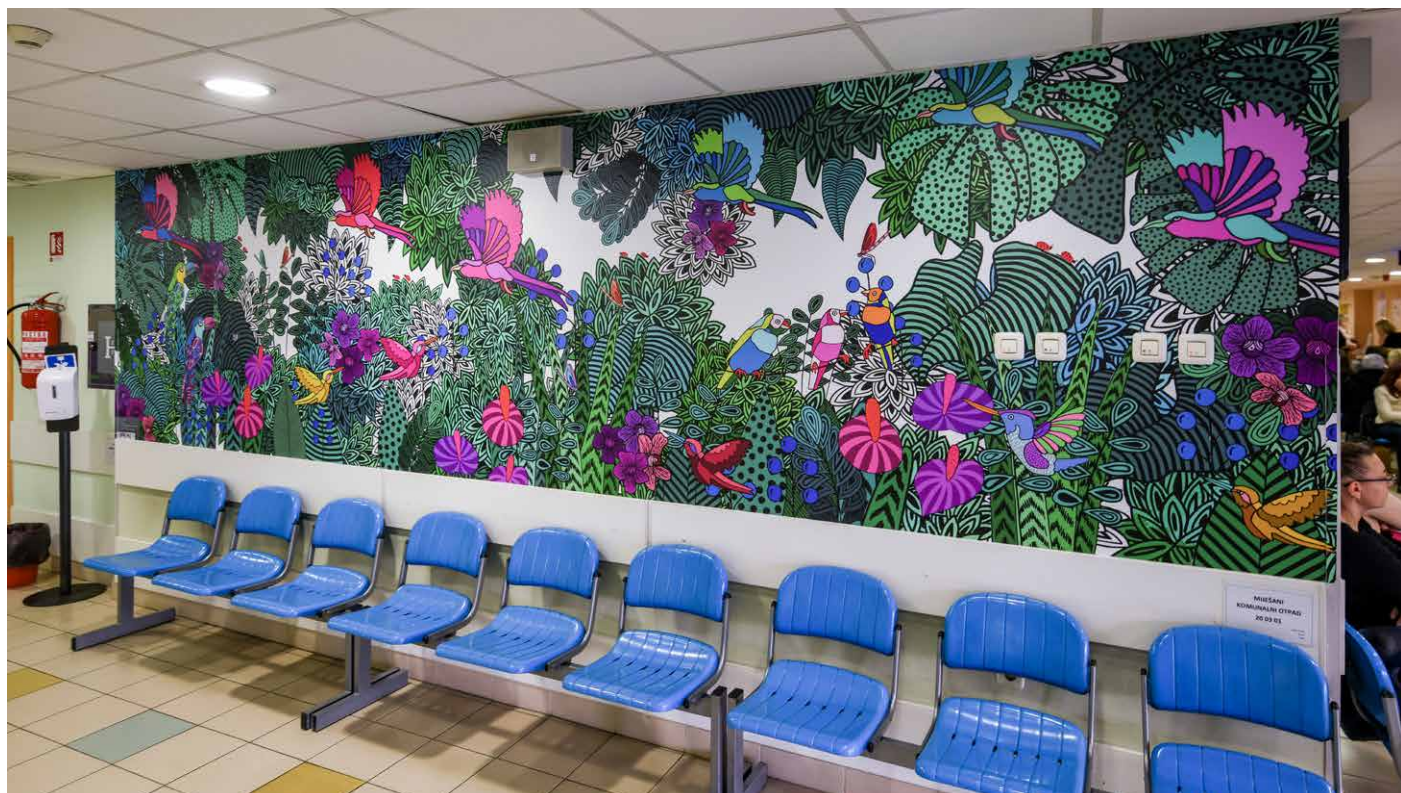
- **Emotional regulation.** Respondents reported feeling more relaxed and less focused on illness; staff observed calmer atmospheres, especially during busy times. This aligns with stress reduction theory and empirical evidence regarding nature-based visual stimuli (Ulrich, 1984, 1991; Kaplan & Kaplan, 1989; Fancourt & Finn, 2019).
- **Psychological safety and dignity.** Warm, coherent and humanised spaces send non-verbal signals that the environment is cared for and that patients are valued. In the Croatian context, rehumanization emphasises that aesthetic interventions are simultaneously ethical acts: they acknowledge vulnerability and respond with attention, colour and narrative (Šefčić, 2018).
- **Meaning, making and narrative.** Murals enable patients, children and families to construct stories that situate illness within a broader, more humane context. For children, the animal and nature scenes became platforms for imaginative play that softened the hospital experience.

These insights echo international literature showing that art in healthcare settings can support well-being, coping and communication (Lankston et al., 2010; Moss, 1987; Stuckey & Nobel, 2010). The Croatian projects contribute a detailed, long-term case study focused specifically on murals as a visual form.

4.2. Positive distraction and wayfinding

The data resonate strongly with research on positive distraction and wayfinding. In both the doctoral and multi-hospital studies, patients and visitors described how murals “shortened waiting time”, “diverted attention in a positive direction” and provided something to “study” instead of focusing on procedures or pain. These functions are consistent with Ulrich’s concept of positive distraction, in which non-threatening environmental features elicit interest and mild fascination without overstimulation (Ulrich, 1991).

At the same time, coherent use of colour and imagery enhanced spatial legibility. Murals functioned as visual anchors in otherwise uniform corridors, assisting orientation and reducing confusion, an effect supported by research on colour and wayfinding in healthcare facilities (Carpman & Grant, 1993; Rangel & Mont’Alvão, 2011). Parents and staff began to use mural motifs in everyday speech to guide movement through the building,



*Figure 5. Garden of Health by Melinda Šefčić (2025), Oncology Clinic Corridor (Sisters of Charity Clinical Hospital Centre – Oncology Clinic).
Photographer: Juraj Vučič. Reproduced with permission of the artist.*

indicating that the visual language of murals had become integrated into the functional organisation of the hospital.

4.3. Evidence-informed mural practice: emerging principles

A key contribution of this programme is the development of design principles that are grounded in both artistic expertise and empirical feedback. Several recommendations emerge:

1. Nature-based and non-threatening motifs. Forests, animals, skies and water are experienced as familiar and safe across age groups and are consistent with biophilic design and prospect refuge theory (Appleton, 1975; Wilson, 1984; Kaplan & Kaplan, 1989).

2. Age-appropriate narratives. Paediatric departments benefit from playful, detailed scenes with characters that invite storytelling and discovery. Adult wards are better served by calmer, more abstract or stylised compositions that avoid infantilisation while still providing warmth and depth.

3. Colour calibration and harmony. Saturated colours should be balanced with softer tones to avoid overstimulation, especially in high-stress units. Colour palettes should be designed in dialogue with existing architectural elements and lighting.

4. Spatial continuity. Murals must be planned in relation to architecture, taking into account doors, corners, windows and circulation patterns. Continuous visual lines can guide movement and unite fragmented spaces, whereas abrupt changes may disorient users.

5. Participatory elements. Involving staff and, where possible, patients and families in motif selection and feedback strengthens ownership and ensures cultural and clinical appropriateness.

6. Integration with institutional strategies. Murals are most effective when embedded in broader renovation and design plans rather than added as isolated gestures. The 2024–2025/2026 *Colorful Hospital* programmes illustrate how murals can be part of strategic planning for corridors, transitional spaces and overall spatial coherence.

These principles align with international calls for evidence-informed, context-sensitive arts-in-health practice (Camic & Clift, 2011; Fancourt & Finn, 2019) and provide a practical framework for future projects.

4.4. Alignment with European and WHO frameworks

The Croatian mural programme is situated within broader European developments that increasingly recognise the role of culture and the arts in health and well-being. The WHO regional scoping review (Fancourt & Finn, 2019) synthesised evidence from over 3,000 studies, highlighting the potential of arts-based interventions across the lifespan and across prevention, promotion, treatment and rehabilitation. The European Commission's *Culture & Health – Time to Act* report (OMC Working Group, 2025) explicitly calls for integrating arts into health policy and practice.

By systematically documenting mural practice over a decade, this work provides:

- a **Southern European case study** of long-term, artist-led interventions in public hospitals;
- evidence that such interventions are well received by patients, staff and visitors;
- a set of **design principles** that can inform policy and guidelines on hospital design, renovation and procurement of art.

The programme also intersects with emerging international initiatives focused on murals as tools for healing and community building in hospitals, thereby contributing to a growing global discourse on “walls that heal”.

4.5. Limitations and future directions

Several limitations should be acknowledged:

- **Sampling and generalisability.** The quantitative studies used convenience samples of limited size, constraining generalisability and precluding more complex statistical modelling.
- **Lack of long-term follow-up.** While post-intervention data capture immediate or short-term perceptions, there is a need for longitudinal studies to examine how mural impact evolves over time.
- **Variability in evaluation methods.** Later projects relied on qualitative methods without repeated pre–post questionnaires, making direct comparison across all sites difficult.
- **Cultural specificity.** Colour and motif preferences may vary across cultures and contexts; findings from Croatian hospitals may not directly transfer to all settings.

Future research directions include:

1. Longitudinal studies on the impact of murals on stress, mood, satisfaction and possibly clinical indicators (e.g. length of stay, analgesic use).
2. Interdisciplinary collaborations with psychologists and neuroscientists to explore physiological markers of stress (e.g. heart rate, cortisol) in relation to mural exposure.
3. Cross-cultural comparative studies of mural programmes in different countries and health systems.
4. More detailed investigation of staff well-being, burnout and job satisfaction in relation to the aesthetic quality of work environments.
5. Development of standardised yet flexible tools for assessing mural impact that can be used internationally.

5. CONCLUSION

Over a ten-year period, mural interventions in Croatian hospitals have demonstrated consistent benefits for patients, families and staff. Across multiple sites and methods, the findings indicate that murals:

- reduce perceptions of sterility and emptiness,
- enhance comfort and positive distraction during waiting,

- support orientation and spatial legibility, and
- foster communication, pride and a sense of belonging within hospital communities.

Art on hospital walls emerges here as an integral component of the healing environment—an infrastructure of care that operates through colour, narrative and attention. In times of increasing pressure on healthcare systems, such interventions remind us that human dignity, emotional safety and aesthetic experience are not optional extras, but fundamental dimensions of health.

For hospital administrators and policymakers, the research suggests that investment in mural programmes is more than symbolic: it is a practical, evidence-informed strategy for improving patient experience, supporting staff well-being and strengthening the social role of hospitals. For artists and designers, the Croatian case provides a framework for responsible, participatory and research-informed practice in sensitive institutional environments, where the wall becomes not merely a background surface, but an active participant in care.

FUNDING

The writing of this article was not funded by any grant or funding body.

ACKNOWLEDGMENTS

The author gratefully acknowledges the participating hospitals, staff members, parents, children and collaborators for their openness, trust and support. Appreciation is also extended to the Croatian Association of Fine Artists (HDLU), Academy of Fine Arts, University of Zagreb, project partners and the funding bodies that supported the project realisations.

DECLARATION OF INTEREST

The author declares no conflicts of interest.

REFERENCES

1. Appleton J. *The experience of landscape*. New York: Wiley; 1975.
2. Kaplan R, Kaplan S. *The experience of nature: A psychological perspective*. Cambridge: Cambridge University Press; 1989.
3. Ulrich RS. View through a window may influence recovery from surgery. *Science*. 1984;224(4647):420–421.
4. Ulrich RS. Effects of interior design on wellness: Theory and recent scientific research. *J Health Care Des*. 1991;3(1):97–109.
5. Wilson EO. *Biophilia*. Cambridge (MA): Harvard University Press; 1984.
6. Moss L. Art in hospitals. *Arts Health Rev*. 1987;1(2):11–18.
7. Carpman JR, Grant MA. *Design that cares: Planning health facilities for patients and visitors*. 2nd ed. Chicago: American Hospital Publishing; 1993.
8. Lankston L, Cusack P, Fremantle C, Isles C. Visual art in hospitals: Case studies and review of the evidence. *J R Soc Med*. 2010;103(12):490–499.
9. Stuckey HL, Nobel J. The connection between art, healing, and public health: A review of current literature. *Am J Public Health*. 2010;100(2):254–263.
10. Camic PM, Clift S. *The arts in health: Designing and researching interventions*. Oxford: Oxford University Press; 2011.
11. Rangel M, Mont'Alvão C. Color and wayfinding: The role of color in environmental communication. In: *Proc Hum Factors Ergon Soc Annu Meet*. 2011;55:575–578.
12. Fancourt D, Finn S. *What is the evidence on the role of the arts in improving health and well-being? A scoping review*. Copenhagen: WHO Regional Office for Europe; 2019.
13. Šefčić M. *Rehumanizacija i reestetizacija bolničkog prostora – primjer likovnog rješenja jednoga bolničkog odjela* [doctoral dissertation]. Zagreb: Academy of Fine Arts, University of Zagreb; 2018. (in Croatian)
14. OMC Working Group. *Culture & health – Time to act*. Luxembourg: European Commission; 2025.