

SOCIAL SUPPORT IN HOSPITAL ARCHITECTURE AND DESIGN: POTENTIALS AND CHALLENGES

APOIO SOCIAL NA ARQUITETURA E NO DESIGN HOSPITALAR: POTENCIALIDADES E DESAFIOS

Accepted date: 11/09/2024 | Submitted on: 10/09/2024

MENDES, Ludmila Cardoso Fagundes, Doctor Student

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil, E-mail:

ludmilamendes@ufmg.br

ORCID: <https://orcid.org/0000-0002-7751-2069>

SOUZA, Roberta Vieira Gonçalves de, Doctor

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil, E-mail:

robertavgs@ufmg.br

ORCID: <https://orcid.org/0000-0003-0036-961X>

ADACHI, Gabriela Souza Podboi, Graduanda

Universidade Federal de Minas Gerais, Belo Horizonte, Brasil, E-mail:

gabrielaadachi@ufmg.br

ORCID: <https://orcid.org/0009-0009-2105-6592>

ABSTRACT

To establish criteria for evaluating the contribution of architecture and design in promoting social support within healthcare facilities, this study used a hospital as a case study. These criteria were based on publications from the Ministry of Health and environmental certification standards. Five key social support indicators were identified: waiting areas, accommodations for companions, interview rooms, internal social spaces, and external gardens or areas for social interaction. The case study revealed that 30% of the indicators were fully met, 20% were partially met, 20% were deemed not applicable, and 30% were not met. The study also highlighted the need to improve standardization requirements.

Keywords: Hospital architecture; Supportive design; Humanization; Well-being; Indicators.

RESUMO

Para definir critérios que avaliassem a contribuição da arquitetura e do design na promoção de apoio social em estabelecimentos assistenciais de saúde, este estudo utilizou um hospital como estudo de caso. Tais critérios foram baseados em publicações do Ministério da Saúde e em normas de certificações ambientais. Foram identificados cinco indicadores principais de apoio social: áreas de espera, acomodações para acompanhantes, sala de entrevistas, espaços internos de convivência e jardins ou áreas externas para convivência. O estudo de caso revelou que 30% dos indicadores foram plenamente atendidos, 20% atendidos parcialmente, 20% considerados não aplicáveis e 30% não foram atendidos. O estudo também apontou a necessidade de melhorar os requisitos de normalização da área.

Palavras-chave: Arquitetura hospitalar; Design de suporte; Humanização; Bem-estar; indicadores.

1. INTRODUCTION

The act of humanizing involves the action of caring for others in a rational way, respecting their individuality (Waldow; Borges, 2011). In health-oriented architecture, humanization is manifested in the creation of environments that favor welcoming, value workers, and integrate users, inciting confidence in healing (Oliveira *et al.*, 2022).

When considering, in the organization of spaces of Health Care Establishments (HCE), the promotion of human well-being, it is pertinent to study the reflections of Professor Roger S. Ulrich, in his Theory of Support Design (TDS). TDS proposes that the *support design* be planned to minimize the stress of users, avoiding factors that can intensify tension and, above all, integrating elements that favor rest and relieve the anguish peculiar to hospital spaces. According to TDS, well-being is achieved when the environment offers "a sense of control", "positive distractions" and "social support", with the present research focusing on the latter (Ulrich, 1991).

"Social support" involves the patient's contact with close people who offer physical or emotional support and is an essential element for users of an EAS. To ensure the effective presence of this support, it is recommended to include spaces dedicated to companions, such as planned waiting rooms, furniture suitable for overnight stays, indoor living areas designed to facilitate contact without compromising patients' privacy, and outdoor spaces, such as gardens, which encourage physical activity and promote relaxation (Ulrich, 1991; Chalfont; Ulrich, 2021; Cho, 2023).

In Brazil the conception of welcoming health spaces is guided by the National Humanization Policy (NHP), which emphasizes the importance of the quality of spaces (Brasil, 2010). ANVISA's Collegiate Board Resolution No. 50 (RDC 50/2002), which regulates the planning, programming, elaboration, and evaluation of physical HCE projects, is another important reference for the creation of health spaces (Brasil, 2002).

The various quality criteria involved in sustainability certifications in buildings can also be applied to increase the quality of hospital environments. AQUA-HQE (*Haute Qualité Environnementale*) and LEED (Leadership in Energy and Environmental Design) certifications include specific guidelines for healthcare institutions, while the WELL Building Standard Certification is an evidence-based certification to promote well-being in buildings in general (Fundação Vanzolini, 2011; USGBC, 2014; IWBI, 2020).

The objective of the present study was then to identify evaluation criteria to analyze the contribution of architecture and design to the promotion of social support, taking a general hospital in Brazil as a case study.

2. GENERAL SPECIFICATIONS

TDS links the promotion of social support to the tangible assistance or emotional support that a person receives from others (Ulrich, 1991). To this end, the space should contribute to the interaction of all types of EAS users: care staff and other professionals working in hospital spaces, patients, and visitors (Tissot, Vergara, Ely, 2020).

Mendes and Souza (2024) stated that the Supportive Design Theory and the Evidence-Based Design are of significant importance in the analysis of hospital spaces, and the compliance to the indicators of those theories can reduce stress and promote user well-being. The authors identified 22 indicators of human well-being, being the most relevant for the study being the individual control of artificial light, the presence of employee resting spaces, the presence of areas or gardens for socialization, the quality of views and the availability of natural lighting. These indicators were recognized as influencing both the comfort of HCE users and the efficiency of medical teams. The research pointed out the importance of planning the architectural design of hospital buildings, so as not to neglect the well-being of users.

In this sense, the provision of outdoor gardens, with benches strategically positioned to facilitate social interaction in small groups, can favor healthy social support between patients that can leave the room and their visitors. However, it is important to avoid spaces that encourage excessive interactions, to not compromise privacy, well-being or generate stressful situations (Ulrich, 1999; Ulrich *et al.*, 2006).

Luz Júnior, Pagel, and Schroeffler (2024), through a systematic review of the literature and case studies with hospitals designed by architect João Filgueiras Lima, also studied how elements of nature are beneficial to promote the well-being of patients, workers, companions, and visitors. In this context, it is seen how biophilic architecture - architectural projects that go beyond aesthetics and adopt the installation of gardens, solariums and humanized spaces with a focus on the user - reduces stress and accelerates the patient's recovery. Such an effect was pointed out even with simple interventions, such as the installation of images that refer to nature. Thus, the authors reinforce the importance of improving biophilic architecture practices, given that, despite its remarkable benefits, the ways to quantify them are ineffective.

Regarding hospital care teams, Tissot, Vergara and Ely (2020) highlight that social support can be perceived by encouraging interaction between different teams during work breaks. The contribution of the physical environment may consist of the inclusion of indoor or outdoor garden areas, with seating, in spaces restricted to employees.

In the research by Putino *et al.* (2020), developed during the COVID-19 Pandemic, frontline health professionals in a New York hospital were invited to experience 15-minute experiences in a recharge room for a consecutive period of 14 days. The experiences, immersive and multisensory, could take place before, during or after work shifts. The recharge rooms included artificial silk plants, projection of relaxing

natural landscapes, low lighting adapted in colors, audio recordings of nature sounds paired with relaxing music, and infusion of essential oils with calming scents. The average stress levels reported by the participants before entering the recharge room were considered elevated. After the first experience in the study space, the average level of reported stress was significantly reduced. The authors concluded that refill rooms, such as those provided in the study in question, significantly reduce the stress perceived by health professionals in the short term and may be of general use in high-stress health settings.

As for the companions and visitors of patients, the hospital space, surrounded by medical equipment, combined with the intense workload of the care team, can make family members feel ignored or displaced. However, as exposed by Sundberg *et al.* (2020) a positive experience with the physical space of the hospital can contribute to visitors feeling included and participating in the care of their hospitalized relatives or friends. As measures to encourage the promotion of social support, Andrade and Devlin (2015) pointed to the creation of inviting shared areas so that visitors feel welcome, which can also favor the patient's well-being. In addition, the authors suggest the use of folding chairs that can be easily stored in the room itself when not used, as well as the inclusion of seats wide enough to serve as beds for companions.

A study conducted in Scotland (Dosser; Kennedy, 2014) addressed the difficulties of nursing teams in communicating with family members of hospitalized terminal patients. The creation of a specific room nearby the ICU to welcome family members of terminally ill patients was one of the measures adopted to improve communication. The room was developed for use by the care team - as a private place to facilitate conversations with patients and family members - and to be used as a quiet place for companions to have a break from the bedside of the bedridden family member, or for patients to receive visits from children. The care team and companions were consulted on how the room should be. It was defined that the space should be relaxing, with comfortable furniture and lighting and with items such as a kettle, coffee maker and microwave. After the first days of using the implemented room, the care team reported immediate and tangible benefits, both for the companions and for the medical team. The main benefits reported by doctors and nurses was to have a private place to have difficult conversations, especially when giving unwelcome news to the patient and his family.

In the context of the elaboration of HCE projects, Giracca *et al.* (2024) studied the importance of forming multiprofessional teams - engineers, designers, and health professionals - in the development of projects after the COVID-19 pandemic. Using qualitative analysis and action research as a method, it was observed that the balance between different knowledge areas in the same team generates greater engagement, and the collaboration is more effective. Also, the assimilation of theoretical knowledge with medical practitioners was pointed out as essential for the development of spaces and products that preserve life. Even so, difficulties of measuring team engagement were pointed out. The authors suggest incorporating practices that involve different professional areas during the academic training of

designers, as a facilitator of their preparation to develop complex projects in more restricted spaces, such as health.

In the academic context, Medeiros (2024) explored recurring aspects in articles published in recent years on architecture and humanization in HCE. The author pointed out that the way of studying humanization in health spaces in Brazil is more mature. The study previously focused on open areas – waiting rooms and outpatient clinics – has been expanded to restricted hospital sectors, such as ICUs and hospitalization areas. The research, conducted by qualitative analysis, relied on the interdisciplinary application of theories and concepts applicable to architectural design to analyze the relationship between the health space and the person. Even pointing to the great possibilities of the theme, the author highlighted the difficulties faced by the high level of ethical requirements to conduct research in hospital spaces, which directly interferes with the execution of studies.

3. METHODOLOGICAL PROCEDURES

The research was developed in two stages: (1) identification of social support indicators and (2) application of the indicators in a case study.

3.1. Identification of social support indicators

The first stage consisted in identifying content associated with the provision of social support, according to the TDS concept. This investigation was based on RDC 50/2002 (Brasil, 2002) CA/PNH (Brasil, 2010) and the technical references of the certifiers AQUA-HQE (Fundação Vanzoli, 2011), LEED (USGBC, 2019) and WELL (IWBI, 2020).

The presence of social support indicators in the AQUA-HQE certification was investigated in the 2011 Certification Reference for Buildings in the Service Sector – Health Organizations, which is a specific reference for HCE (Fundação Vanzoli, 2011). The indicators present in LEED were identified in the text of the LEED v4 Reference for Building Design and Construction, from 2014 (BD+ C: Health Units) and from the updates of version 4.1, from 2021 (USGBC, 2014, 2021). Finally, to identify the indicators present in the WELL certification, version v2 of the 2020 Benchmark (IWBI, 2020) was consulted.

The recognized "social support" indicators were summarized in a table together with the respective requirements present in each source consulted, when applicable.

3.2. Application of the indicators in a case study

The indicators of "social support" identified in the publications of the Ministry of Health and in the technical references of the certifications were tested at the Hospital São Vicente de Paulo (HSVP), located in Belo Horizonte, MG, and inserted in the Health Campus of the Federal University of Minas Gerais (UFMG) - Hospital das Clínicas.

The installed capacity of HSVP is 504 beds. In addition, the hospital has care, administrative and teaching activities, which encompass different profiles of HCE users. The building is divided into wings, which are named according to their geographical orientations.

The Adult Intensive Care Center (ICU), which is located in the East Wing of the 3rd floor, and the Medical Clinic Hospitalization, located in the North Wing of the 7th floor, were the units selected to analyze the specific indicators for internal spaces associated with hospitalization (Figure 1). More general indicators, related to areas common to all users, were analyzed for the building as a whole.

Figure 1: Identification of the hospital wings analyzed in the case study.



Source: Mendes, 2023.

As it is a building for hospital use, for the development of the case study, it was necessary to submit the Research Project to the Research Ethics Committee of the Federal University of Minas Gerais (CEP-UFMG), via Plataforma Brasil - CAAE: 59237122.7.0000.5149 - and to the Research Network of the Brazilian Company of Hospital Services (EBSERH) - Process EBSERH HC-UFMG: 23537.012637/2022-18. The approval by the two ethics committees took place in September 2022. Thus, it was possible to access the building's plans and carry out on-site visits.

In possession of the plans of the architectural survey of the building, a preliminary analysis of the sectors was conducted. Thus, the available area, the interconnection with external areas and the location of the Adult ICU and of the Medical Clinic, the presence of living areas for employees; and accessible areas for companions and visitors, such as waiting and living areas were verified.

After selecting the spaces for the application of the indicators, two technical visits were carried out, accompanied by EBSEH architects. The first took place on September 29, 2022, in the external areas of the hospital complex, in the hospital chapel and in the Adult ICU.

On the second visit, which took place on October 8, 2022, the inpatient ward of the Medical Clinic and the main entrance areas of the hospital were visited. During the visits, photographic surveys of the areas and the documentation of available furniture were made, for the comparison with the space requirements presented in the SomaSUS virtual tool, made available by the Ministry of Health (SomaSUS, 2024).

Finally, the results of the applicability of the social support indicators in the case study were presented in a table, with the identification of the fulfillment or not of the indicators, according to the requirements presented in the first stage of the research.

4. RESULTS

4.1. Identification of social support indicators

Consultation of the texts of RDC 50/2002, CA/PNH and of the technical references of the three selected certifiers allowed the recognition of five "social support" Indicators. Chart 1 presents the indicators accompanied by the requirements required in each source consulted.

Chart 1: Social support indicators presented in the literature.

Indicator	Source	Requirements
Waiting areas	RDC 50/2002	Mandatory for intensive hospitalization. Minimum area of 1.3m ² /person
	CA/PNH	Waiting area capable of welcoming visitors. Easy access to toilets and drinking fountains.
Companion accommodation	RDC 50/2002	Space for a companion seat next to the geriatrics, neonatology and pediatrics beds.
	CA/PNH	Spaces capable of accommodating companions
Interview room	RDC 50/2002	Assistance to companions for the transfer of information from hospitalized patients (optional for intensive care unit)
	CA/PNH	Spaces capable of welcoming visitors: a listening space.
Indoor areas for coexistence	CA/PNH	Meeting, listening and reception spaces, for interaction between users and employees and between teams of employees, with comfortable and sufficient furniture. Rooms where the patient, in conditions, can receive visits outside the bed.
	WELL	<u>Social engagement</u> : internal community space ≥ 186m ² , with signage and communication about the conditions of use, accessible and with quality seating. <u>OR</u> meeting and event spaces, capacity ≥10 people, weekly availability.
Outdoor areas or gardens for coexistence	CA/PNH	<u>Gardens and areas with benches</u> : a place to sit, relax, meet and integrate. Provide multifunctional outdoor spaces for comfortable waiting and for socializing, interacting and physical activity practices.
	AQUA-HQE	<u>Quality of outdoor spaces for users</u> : spaces for socializing, resting or private activities, accessible to all users.

Indicator	Source	Requirements
	LEED	Direct access to patio, terrace, garden or external balcony: Area $\geq 0.5\text{m}^2/\text{patient}$ for 75% of inpatients and 75% of outpatients, who stay for more than 4 hours in the EAS. External space for interaction: with the space; social; passive recreation and physical activities, $\geq 30\%$ of the land area. At least 25% of this space must have vegetation (except lawn) OR with aerial vegetation cover. It must be accessible and have pavement or lawn for pedestrians and/or for recreation, with elements for outdoor social activities and/or physical activities; OR garden with diversity in vegetation and species throughout the year; OR community gardens or food production.

Source: Mendes, Souza, Adachi (2024), based on Brasil (2002; 2010); Fundação Vanzolini (2011); USGBC (2014; 2021); IWBI (2020).

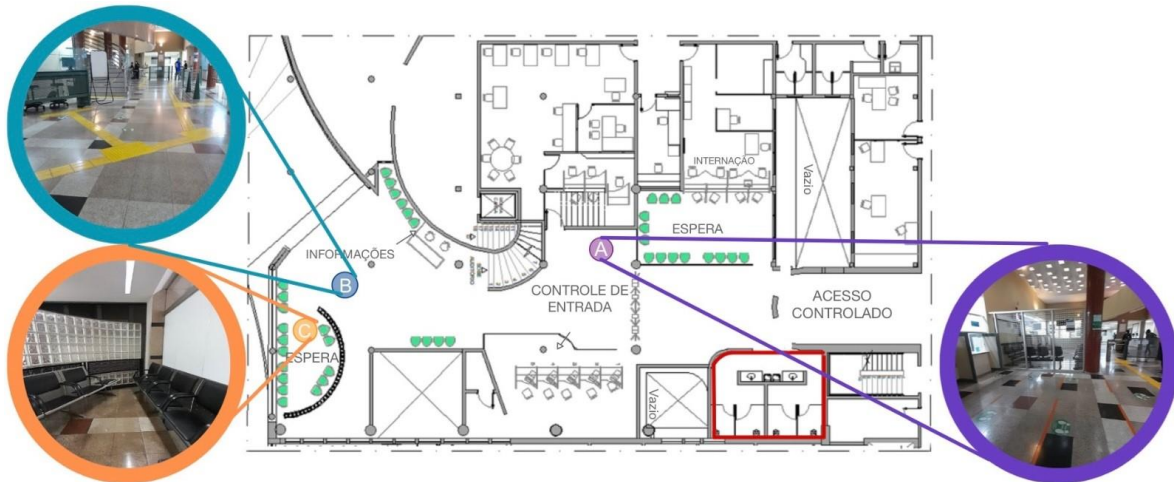
As exposed, the reception of visitors and companions is a theme present in all sources consulted. It is noteworthy that the five indicators identified can be associated with this profile of HCE users. The first three indicators present in Chart 1 were recognized only in the publications of the Ministry of Health. The others are present in the CA/PNH and in at least one technical certification reference. In addition to covering welcoming, the last two indicators also highlight the importance of meeting places. Outdoor areas or gardens for relaxation, meetings and interaction make up an indicator of social support identified in the five references, which presents varied requirements and can be beneficial to all profiles of users of hospital buildings.

4.2. Application of the indicators

The Medical Clinic Hospitalization is not required to have its own waiting area. Thus, for this hospitalization unit, the general waiting area of the HSVP, located in the main entrance hall for visitors, was analyzed.

The waiting space (Figure 2) is large and has physical divisions that delimit the areas of information; entry control; hospitalization and discharge control; and waiting for discharged patients. The most delimited spaces are the waiting areas indicated in Figure 2 as "A" and "C". Considering the number of chairs available on the day of the visit, there are 1.9 m^2 per person for area "A" and 1.3 m^2 for area "C", meeting the requirement of a minimum area of 1.3 m^2 per person, present in RDC 50/2002. Area "B" corresponds to an open circulation space, with some chairs distributed. Near the entrance control, two bathrooms separated by sex and two drinking fountains were identified. Visitors are allowed to enter the hospitalization wards only during visiting hours, or to change companions.

Figure 2: Waiting areas on the ground floor.

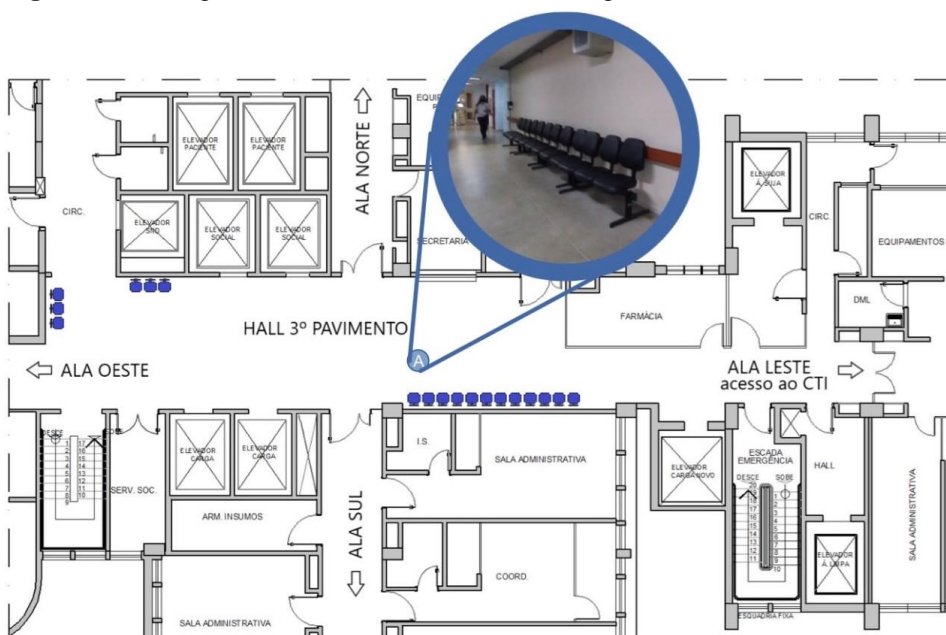


Source: Authors.

According to RDC 50/2002, intensive care centers must have specific waiting areas. This area is necessary due to the limitation of the number of visitors per patient simultaneously. The analysis of the floor plans and the visit to the HSVP confirmed that the Adult ICU has its own waiting area for the sector.

The rows of stringers are distributed throughout the central hall of the 3rd floor, near the entrance to the ICU (Figure 3). The water fountain is in a nearby corridor, in the North Wing, but it is not an accessible water fountain. There are no visitor restrooms in this hall, or in the vicinity of the ICU and there is no signage on the location of the nearest restrooms. Although the visit to the sector is for a limited time and the period of stay in this waiting area is short, the requirements of this social support indicator were not considered met due to the limitation on the use of bathrooms and drinking fountains.

Figure 3: Waiting area - Adult ICU; nearest drinking fountain and bathroom.



Source: Authors.

Although HSVP allows visits to adult patients in intensive care, staying as a companion is not allowed in the ICU. Thus, the presence of accommodations for the overnight stay of companions is not applicable to the Adult ICU, having been analyzed only for hospitalization at the Medical Clinic.

Within the hospitalization unit under consideration, RDC 50/2002 establishes that the presence of an armchair at the bedside is mandatory only for the companions of elderly patients. Despite this, during the visit, reclining chairs were observed next to all beds in all wards, regardless of the age of the patients. (Figure 4). The sources consulted do not present clear requirements regarding the comfort of the armchairs, but it was observed that they are upholstered with material that is easy to clean, have armrests and footrests. Therefore, this indicator was considered met.

Figure 4: Seats for companions next to the beds of the Medical Clinic.



Source: Authors.

The interview room is a space where information about the patient's clinical condition is passed on to the family, allowing greater privacy and, consequently, welcoming. This is an optional environment for ICU and is not mentioned for other hospitalization units.

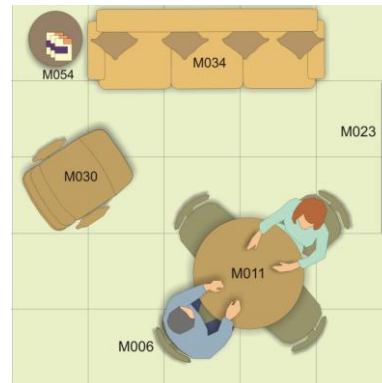
The analysis of the hospital plan, as well as the technical visit carried out, confirmed the existence of this space in the Adult ICU. Although RDC 50/2002 and CA/PNH do not present minimum requirements for the configuration of interview rooms, a comparison of the existing furniture was made by the consultation of the layout plan and the complementary list of furniture, made available by the SomaSUS tool (Figures 5 and 6). Although the corner table and the armchair were not identified in the ICU interview room, the space has furniture and equipment present in the complementary list of SomaSUS, which are not present in the reference plan, such as: computer table; computer; archive; and closet. Considering that most of the furniture mentioned in the tool was identified, the indicator was considered met for this space.

Figure 5: CTI Interview Room.



Source: Authors.

Figure 6: Layout model for Interview Room.



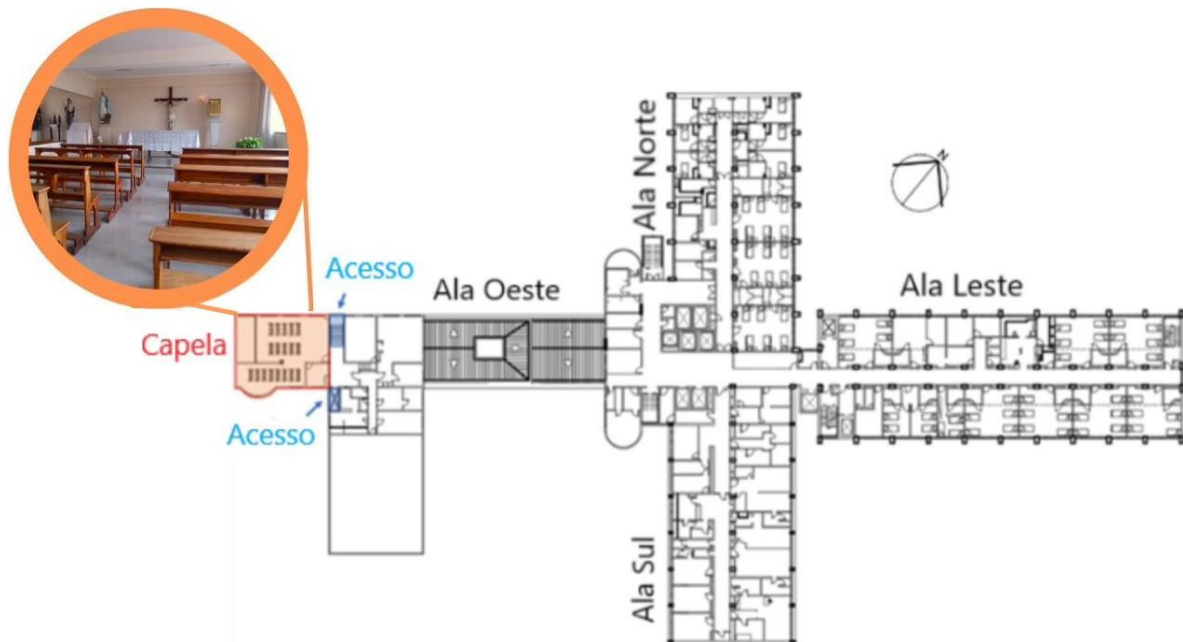
- M006 – chair
- M011 – meeting table
- M023 – Bulletin board
- M030 – armchair
- M034 – sofa
- M054 – coffee table

Source: SomaSUS, 2024.

The only internal living area identified in the building, and open to all user profiles, is an ecumenical chapel. The physical area of this chapel is 110m², lower than the minimum area determined by the first criterion of the WELL reference (186 m²). However, the chapel meets the second WELL evaluation criterion, as it can be considered a weekly event space with a capacity of more than 10 people.

Located in the West Wing of the 7th floor, the chapel is physically isolated from other hospitalization wings, from the aforementioned floor, and it is necessary to move to the lower floor, where the vertical circulations enable access (Figure 7). This space was considered as partially attending the related indicator of social support.

Figure 1: HSVP Chapel and its location.



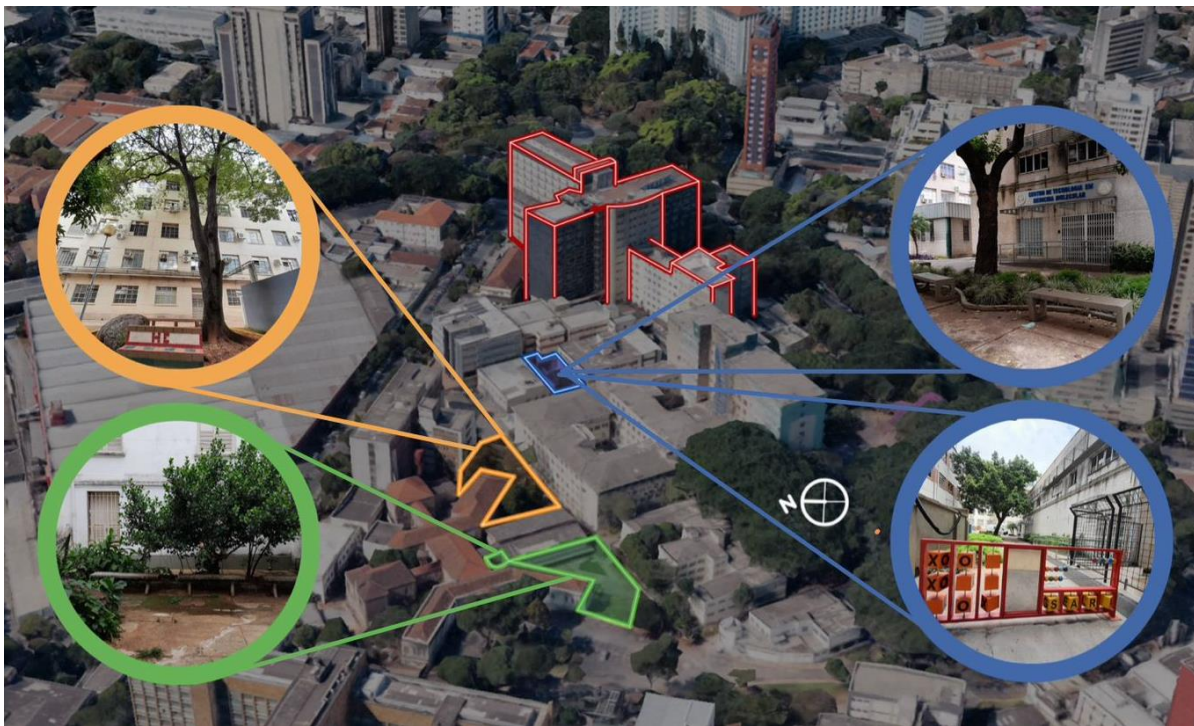
Source: Authors.

No gardens or outdoor areas accessible to users were identified within the boundaries of the HSVP building. However, the building is located within the UFMG Health Campus, which has seven buildings for outpatient care, in addition to a

building for housing resident doctors, the School of Nursing and the Faculty of Medicine.

During the technical visit, outdoor spaces with benches and flowerbeds were detected, established on the pedestrian routes between the Campus buildings (Figure 8).

Figure 2: Location of the gardens.



Fonte: Google Earth, 2024, as amended by the Authors.

Although these spaces are open to the public and can be used by employees, visitors and patients in consultation, hospitalized patients are unable to enjoy these spaces, since there is no delimitation that separates the land occupied by the HSVP from the rest of the campus. As seen, among the sources consulted, the LEED and WELL references have specific requirements for areas or gardens. However, no compliance with any of the requirements presented in Chart 1 was identified. The vegetation of the spaces identified on the Campus is scarce and the few benches are arranged in positions that do not contribute to social interaction. The area with the greatest coverage and plant diversity is located near the entrance of Borges da Costa Hospital, more than 200m from the study case building, exceeding the limit set by the WELL certification. These spaces are not flagged and are not accessible to all user profiles.

5. DISCUSSIONS

Chart 2 compiles the results regarding the fulfillment of social support indicators in the Adult ICU and in the Internal Medicine Hospitalization of the HSVP. Indicators that have fully complied with the requirements, either by the presence of a space or

adequate furniture, are highlighted in blue. The gray color indicates partial compliance, the red color highlights that the requirements were not met and the white color, that the indicator is not applicable to the sector evaluated. Overall, 30% of the indicators were fully met, 20% were partially met, 20% were not applicable, and 30% did not meet the requirements. Given this scenario, compliance with the requirements analyzed is considered low.

Chart 2: Case study compliance for social support indicators.

Indicator	User	Indicator Compliance	
		CTI	Medical Clinic
Waiting areas	Companions and visitors	Doesn't comply	Complies
Overnight accommodation	Companion	Not applicable	Complies
Interview room	Companions and visitors	Complies	Not applicable
Indoor areas for coexistence	All except ICU patients	Partially complies	
Gardens or outdoor areas accessible for living	All except ICU patients	Doesn't comply	

Source: Authors.

The general waiting area of the HSVP, considered for the analysis of the waiting area of the Medical Clinic, met the minimum requirements for the area, with the presence of stringers, bathrooms and drinking fountains. The space features a variety of shapes, colors and materials, as well as a play of lights near the ceiling, which contribute to the ambience, promoting a positive distraction for users. However, it is considered that the standardization in this regard and also the technical references of the certifications could explore the ambience of the space as a whole, with more specific requirements.

To evaluate the accommodations for overnight stays, the presence of a reclining chair upholstered with washable material next to each bed was considered. It should be noted that this must be a minimum requirement to be observed. More refined criteria could measure comfort levels for chairs, recliners or sofa beds, which can be offered to companions.

The existence of an "interview room" could be included in a revision of RDC50, at least as an option for other hospitalization units in addition to the ICU. Sometimes, in the absence of this room, relatives receive unpleasant news about patients in corridors or other spaces that are inappropriate for this. It is an important space for reporting to patients' families, which adds privacy in difficult times. It is notorious that inclusion as an "optional space" could lead to no implementation at all in some HCE, often for reasons of physical area limitation, which privilege mandatory spaces. However, it is understood that the recommendation can alert and encourage hospital designers and managers about the relevance of this space.

The existence of the Chapel, as an internal living area, partially served as an indicator of social support because it is a space related exclusively to Christianity.

The symbolism of such a relationship may arouse marked importance for some users, but it may also have no relevance for others. The existence of another internal space for community use, without religious symbolism, could be beneficial for a greater reach of social support.

Finally, accessible gardens are widely recommended in the materials consulted. This indicator of social support should receive special attention in hospital buildings, since its existence can be linked to both restoration and a living environment. Both the CA/PNH, as well as all the certification references studied, indicated that the presence of gardens can be beneficial for patients, visitors, companions and HCE employees.

6. CONCLUSION

In general terms, the presence of social support in HCE is characterized by a positive dynamic interaction between workers, patients and visitors, through welcoming and functional enclosures. The hospital environment, by providing social support, contributes to intensify health promotion. In the same way, it also ends up contributing to the satisfaction of visitors and to the performance and professional contentment in the care work space. Thus, the careful integration of such elements is essential for a more humane and efficient hospital environment.

The present research highlighted not only the importance, but also the need to include welcoming spaces in HCE, in addition to what is established by RDC 50/2002 (Brasil, 2002). While normative guidelines are essential for the construction and maintenance of healthcare environments, the additional materials consulted reveal that creating spaces that promote "social support" requires a more holistic approach. These additional requirements offer guidance to designers, allowing them to design indoor and outdoor spaces that not only meet functional needs, but also promote the physical and mental restoration of the different user profiles of HCE buildings.

The application of the indicators in a case study allowed not only a deeper understanding of the established requirements, but the recognition of the need to improve such requirements. Practice has revealed that while current requirements provide a solid foundation, there is significant room for refinements that can raise the quality of social support offered to hospital systems. In addition, it is important to highlight that other parameters can be incorporated into the analysis to obtain a more comprehensive and detailed evaluation. These additional parameters can include aspects such as users' perception of the space, the effectiveness of spaces in promoting positive social interactions, and the adaptation of spaces to the specific needs of different user groups.

It is also considered that the importance of exploring new sources of information and indicators of "social support" cannot be underestimated. Research that seeks to identify these sources is key to expanding the understanding of how the environment of HCE can be optimized to promote positive social interactions and

well-being. By integrating knowledge from different areas, such as environmental psychology, sociology, and design, these researches can provide a more robust theoretical and practical basis, enabling the creation of hospital environments that go beyond compliance with standards and regulations, offering a more humanized and welcoming experience. Ultimately, this multidisciplinary approach can contribute significantly to the evolution of construction and management patterns in health, ensuring that HCE are spaces truly geared towards contributing to healing.

REFERENCES

ANDRADE, C. C.; DELVIN, A. S. Stress reduction in the hospital room: applying Ulrich's theory of supportive design. **Journal of Environmental Psychology**, v. 41, p. 125-134, 2015.

BRASIL. Ministério da Saúde. Secretaria de Atenção à Saúde. Núcleo Técnico da Política Nacional de Humanização. **Ambiência**. Ministério da Saúde, Secretaria de Atenção à Saúde, Núcleo Técnico da Política Nacional de Humanização. 2. ed. Brasília: Editora do Ministério da Saúde, 2010.

BRASIL. Ministério da Saúde. **Resolução RDC nº 50, de 21 de fevereiro de 2002**. Dispõe sobre o regulamento para o planejamento, elaboração, avaliação e aprovação de projetos físicos de Estabelecimentos Assistenciais de Saúde. Diário Oficial da União, Brasília, 2002.

CHALFONT, G.; ULRICH, R.S. Design with nature for ageing: health-related effects in care settings. In: GROMARK, S.; ANDERSON, B. (edit). **Architecture for residential care and ageing communities**. New York, NY: Routledge, p. 189-201, 2021.

CHO, M. Evaluating Therapeutic Healthcare Environmental Criteria: Architectural Designers' Perspectives. **Int. J. Environ. Res. Public Health**, v. 20 (2), 1540, 2023. DOI: <https://doi.org/10.3390/ijerph20021540>.

DOSSER, I., KENNEDY, C. Improving family carers' experiences of support at the end of life by enhancing communication: an action research study. **International Journal of Palliative Nursing**, 20(12), 608–616, 2014. DOI: <https://doi.org/10.12968/ijpn.2014.20.12.608>.

FUNDAÇÃO VANZOLINI. **Referencial técnico de certificação edifícios do setor de serviços Processo AQUA**: organizações de saúde. São Paulo: FCAV, 2011.

GIRACCA, C.N. *et al.* Interprofissionalidade entre design, engenharia e saúde (ides): soluções colaborativas em tempos de pandemia. **Gestão & Tecnologia de Projetos**, São Carlos, v. 19, n. 1, p. 187–211, 2024. DOI: 10.11606/gtp.v19i1.209342.

IWBI. INTERNATIONAL WELL BUILDING INSTITUTE. **WELL v2**: The next version of the WELL Building Standard. 2020

LUZ JÚNIOR, J.A.; PAGEL, E.C.; SCHROEFFER, K.G. Arquitetura biofílica em espaços hospitalares: uma análise nos projetos da rede Sarah. **Gestão & Tecnologia de Projetos**, São Carlos, v. 19, n. 1, p. 105–124, 2024. DOI: <https://doi.org/10.11606/gtp.v19i1.212053>.

MEDEIROS, L. Arquitetura e humanização em saúde: aproximando saberes e perspectivas. **Gestão & Tecnologia de Projetos**, São Carlos, v. 19, n. 1, p. 51–67, 2024. DOI: <https://doi.org/10.11606/gtp.v19i1.210108>.

MENDES, L.C. F. **Fatores humanos na arquitetura para a saúde:** indicadores e percepções. 2023. 164f. Dissertação (Mestrado em Ambiente Construído e Patrimônio Sustentável) - Universidade Federal de Minas Gerais, Belo Horizonte, 2023.

MENDES, L.C.F.; SOUZA, R.V.G. Indicadores que interpretam fatores humanos na arquitetura hospitalar. **Gestão & Tecnologia de Projetos**, São Carlos, v. 19, n. 1, p. 125–147, 2024. DOI: <https://doi.org/10.11606/gtp.v19i1.209924>.

MENDES, L.C.F, SOUZA, R.V.G., ADACHI, G.S.P. Apoio social em estabelecimentos assistenciais de saúde: contribuições da arquitetura e do *design*. In: ENSUS2024 – XII Encontro de sustentabilidade em Projeto, 2024, Belo horizonte. **Anais...** Florianópolis: UFSC, 2024.

OLIVEIRA, C.; GOMES, C.A.; PEREIRA, A.D.A.; LOMBA, M.L.L.F.; POBLETE, M.; BACKES, D.S. Acolhimento e ambiência hospitalar: percepção de profissionais da saúde. **Acta Paul Enferm**, v. 35, 2022. DOI: <https://doi.org/10.37689/acta-ape/2022AO032166>.

PUTRINO, D. *et al.* Multisensory, Nature-Inspired Recharge Rooms Yield Short-Term Reductions in Perceived Stress Among Frontline Healthcare Workers. **Frontiers in Psychology**, v. 11 (560833). DOI: <https://doi.org/10.3389/fpsyg.2020.560833>

SOMASUS. **Sistema de Apoio à Elaboração de Projetos de Investimento em Saúde.** Available at: <http://somasus.saude.gov.br/somasus/redirect!tamanhoTela.action>. Accessed in 30 jan. 2024.

SUNDBERG, F.; FRIDH, I.; LINDAHL, B. KAREHOLT, I. Visitor's Experiences of an Evidence-Based Designed Healthcare Environment in an Intensive Care Unit. **Health Environments Research & Design Journal**, v. 14, p. 178-191, 2021.

TISSOT, J. T.; VERGARA, L. G. L.; ELY, V. H. M. B. Definição de atributos ambientais essenciais para a humanização em quartos de internação. **Ambiente Construído**, Porto Alegre, v. 20, n. 3, p. 541-551, jul./set. 2020.

ULRICH, R. S. Effects of interior design on wellness: Theory and recent scientific research. **Journal of Health Care Interior Design**, v. 3, 97-109, jan. 1991.

ULRICH, R. S. Effects of gardens on health outcomes: theory and research. In: MARCUS, C.C.; BARNES, M. (org.). **Healing gardens**. New York: John Wiley & Sons, p. 27-86, 1999.

ULRICH, R. S. Essay: Evidence-based health-care architecture. **The Lancet**, v. 368, p. 38-39, dez. 2006.

USGBC. UNITED STATE GREEN BUILDING COUNCIL. **LEED v4 para projeto e construção de edifícios**. 2014.

USGBC. UNITED STATE GREEN BUILDING COUNCIL. **LEED v4.1 Building design and construction**. 2021.

WALDOW, V.R.; BORGES, R.F. Cuidar e humanizar: relações e significados. **Acta Paul Enferm**, v. 24 (3), 2011. DOI: <https://doi.org/10.1590/S0103-21002011000300017>.

ACKNOLEGMENTS

The authors would like to thank the Hospital das Clínicas of UFMG, the Brazilian Company of Hospital Services (EBSERH) and the National Council for Scientific and Technological Development (CNPq 302771/2020-5), for the support received for the development of this research.