ICONARP
International Journal of Architecture and Planning
Received: 11.06.2023 Accepted: 21.06.2025
Volume 13, Issue 1/ Published: 30.06.2025
Research Article *DOI: 10.15320/ICONARP.2025.330 E- ISSN:2147-9380*

Evaluation of Healthcare Staff Satisfaction Regarding Furniture Design for Working and Resting Spaces

Zeynep Tuna Ultav *
Çiğdem Çetin **
Gülnur Ballice ***
Gizem Güler Nakıp ****

Abstract

The quality of healthcare interiors is considered an important factor in the well-being and satisfaction of healthcare staff. Accordingly, this study evaluates the satisfaction of doctors and nurses with the furniture they use in their working and resting areas in healthcare interiors. This paper's originality lies in examining the perspective of healthcare staff –doctors and nurses– as users and also investigating furniture as a crucial factor in shaping user satisfaction regarding interior spaces. In this research, a qualitative study, including observation and a case study, is supplemented by a quantitative study, including research and a survey. The method of the study includes a literature review, field trips, structured questionnaires, and semi-structured interviews with the healthcare staff of the four selected hospitals in Turkey. The findings from observations, questionnaires, and interviews are evaluated through a literature review conducted in this study, as evidenced at the conclusion of each analysis section. The data regarding user satisfaction of furniture in the hospitals' interior spaces were analyzed in terms of tangible physical attributes of furniture such as ergonomic qualities, functionality in layout, sensory qualities of materials and color, and intangible psycho-social attributes such as a sense of belonging/personalization and privacy/sense of control. These factors, along with belonging and privacy, enhance the awareness of interior design in creating healthy, safe, and comfortable hospital environments. The paper contributes to a gap in knowledge regarding the physical and psycho-social features of furniture that influence healthcare staff's physical and mental health and raises awareness about using interior design to create healthy, safe, and comfortable hospital environments. The research suggests that the interiors of well-designed healthcare facilities have a positive and curative effect on staff and patients; therefore, it should be addressed comprehensively.

Keywords: *Healthcare interiors, Healthcare staff, Physical attributes, Psycho-social attributes, User satisfaction.*

*Department of Interior Architecture and Environmental Design, Yaşar University, Izmir, Turkey.
E-mail: zeynep.tunaultav@yasar.edu.tr

**Department of Interior Architecture and Environmental Design, Yaşar University, Izmir, Turkey.
E-mail: cigdem.cetin@yasar.edu.tr

***Department of Interior Architecture and Environmental Design, Yaşar University, Izmir, Turkey.
E-mail: gulnur.ballice@yasar.edu.tr

****Department of Theory, Design and History of Architecture, Silesian University of Technology, Gliwice, Poland. (Corresponding author)
E-mail: gizem.gulernakip@polsl.pl

To cite this article: Tuna Ultav, Z., Çiğdem, Ç., Ballice, G., & Güler Nakıp, G. (2025). Evaluation of Healthcare Staff Satisfaction Regarding Furniture Design for Working and Resting Spaces. ICONARP International Journal of Architecture and Planning, 13 (1), 410-442. DOI: 10.15320/ICONARP.2025.330

INTRODUCTION

Designing healthcare buildings involves addressing complex architectural challenges, integrating advanced technology, and prioritizing the protection of human well-being. This necessitates a holistic and empathetic approach to ensure optimal outcomes for all stakeholders (Jablonska & Furmanczyk, 2024). In Turkey, there is the potential to improve the interior spaces used by healthcare staff, especially nurses and doctors in state-owned healthcare facilities. Enhancing these qualities could significantly raise the level of satisfaction and well-being of the healthcare staff. Despite the recent surge in healthcare research and the availability of relevant information on design features, there remains a need for updated data on the beneficial implications of the physical indoor environment, as well as related guidelines and standards (Salonen et al., 2013). Academic literature focusing on the spatial satisfaction of healthcare staff in Turkey is also quite limited. In order to address this gap in the literature, the present study explores user satisfaction in the working and resting spaces of doctors and nurses –doctors' examination rooms, nurse stations, and doctors' and nurses' resting rooms.

Growing evidence of the impact of environmental features on health and well-being in healthcare facilities has led to a greater emphasis on the consequences of design choices in these spaces (Salonen et al., 2013). Within the larger context of healthcare interiors, this study focuses on furniture as a design element that complements an interior space. Careless selection or non-selection of these elements can make an interior space incomplete or unfinished. Inevitably, furniture is used to support people's actions, activities, and needs. Therefore, it has a close connection in various ways with the user. Not just the physical comfort, the furniture and its layout also affect the psycho-social comfort of the user (Xue et al., 2024). So, besides other elements in interiors, furniture should be carefully designed throughout the design process.

Various studies explore the creation of healing environments through both tangible design elements and intangible factors (Schweitzer, 2004; Chrysikou, 2014; Iyendo, 2016; Osonwa, 2023). Tangible elements can be defined as perceivable by the senses, especially by touching. Thus, the physical features of the furniture and its layout can be defined as tangible features, and they affect the overall satisfaction of the user with the other parameters. In contrast, intangible ones do not have any presence or physical entity and cannot be perceived by the senses. So, the furniture directly has a relation with the psycho-social entity of the user. The psycho-social needs of the user, such as having control of the environment or having a sense of belonging, tend to play an important role in this intangible contact with the furniture.

Accordingly, the present study evaluates the furniture with its tangible and intangible properties. Tangible properties cover its physical attributes, such as ergonomic qualities, functionality in layout,

DOI: 10.15320/ICONARP.2025.330

sensory qualities of materials and color; and intangible ones cover psycho-social attributes, including a sense of belonging/personalization and privacy/sense of control. Elements that positively impact the well-being of healthcare staff are showcased to highlight promising practices that enhance benefits and boost satisfaction.

This study investigated four state hospitals in İzmir, Turkey: Urla State Hospital (UH), Tepecik Education and Research Hospital in Bornova (TEH), Tire State Hospital (TIH), and Çeşme State Hospital (ÇH), which have 200, 180, 150, and 75 beds, respectively. With the findings obtained from the study, it is aimed to determine the deficiencies of the existing healthcare buildings from the user perspective and propose design inputs for future designs to enhance staff satisfaction in healthcare interiors.

Data obtained from literature, observations, and surveys have shown that ergonomics, layout, materials, and colors play an important role in the physical and mental health of healthcare professionals as physical features, and belonging and privacy as psycho-social features. Moreover, these features increase awareness of the use of interior design to create healthy, safe, and comfortable hospital environments. The research findings show that the boundary that healthcare professionals prioritize between themselves and the patient can be defined if the furniture size, proportions, and layout are designed appropriately. Accordingly, the interiors of healthcare facilities should be considered comprehensively in terms of having a positive and healing effect on staff and patients.

LITERATURE REVIEW

According to Postell (2012), dictionaries and encyclopedias define furniture through terms such as accessories, equipment, and movable objects, which describe its physical character and performance. The choice of furniture, its placement within the interior, and its interaction with other furniture create a compositional order. In other words, furniture forms and completes the composition of the interior space (Özel, 2021). According to Ching (2007), furniture acts as an intermediary between architecture and users of the space. By enabling interior activities, furniture provides the transition between the interior and the individual in form and scale. Thus, in the formation of a space, furniture and accessories are as important as structural components such as walls, floors, doors, and windows. The design, selection, manufacture, and arrangement of furniture, which acts in relationship with people, requires theoretical and technical knowledge, making it an interdisciplinary and holistic field of study (Postell, 2012).

In providing the functionality needed in specific places, furniture is shaped according to different types of social use. One of the most important types is healthcare furniture. In order to accommodate different groups of people, from hospital staff to doctors and from patients to patients' relatives, furniture selection for hospital interiors should ensure the users' efficiency and comfort. More specifically, in

healthcare settings, furniture selection should consider the physical condition and frailty of the users (Zaman & Zaman, 2022). Although levels of care vary for patients (from a doctor's office to rehabilitation to critical care), the following criteria should be met in all cases: proper dimensions and weight, durability and quality of upholstery. The furniture must have the appropriate height, depth, and styles to ensure the users' ergonomic convenience. They must also be of appropriate weight to be easily portable and stable for the safety of users. In addition, for some users, the furniture can provide comfort if it supports their movements. Finally, upholstery materials should be easily cleanable, water resistant, and provide antibacterial protection and be easily changed when required (Varol, 2023).

Furniture is tangible in that it can be experienced physically and spatially. However, it also has intangible aspects. Therefore, furniture designers must consider these tangible and intangible attributes together (Postell, 2012). The beneficial design implications of interior physical components are crucial for creating and operating healthcare services that support overall health and well-being. These considerations must meet the current and future needs of Western medicine while integrating essential elements (Salonen et al., 2013). Accordingly, the present study holistically addresses physical attributes as tangible and psycho-social attributes as intangible features in measuring user satisfaction in healthcare interiors through furniture.

Physical Attributes

Physical attributes in interior design refer to the characteristics of a space that influence its functionality, comfort, and overall user experience. These attributes include dimensions, proportions, material properties, and spatial organization, all of which contribute to the usability and aesthetics of an environment. In healthcare settings, physical attributes are particularly critical in ensuring safety, efficiency, and accessibility for both patients and staff. Elements such as furniture design, layout planning, and material selection must be carefully considered to support well-being and operational effectiveness.

Given their significance, the key aspects of physical attributes—including ergonomic qualities, spatial layout, and sensory factors like materials and colors—are further examined in the following sections. These detailed discussions explore how design choices can enhance staff performance, facilitate patient recovery, and create a functional and healing environment for all users.

Ergonomic qualities

Ergonomics is the study of scientifically examining the interaction between humans and the working/living environment and designing this environment according to human characteristics (Attaianese & Duca, 2012). The basic principles of workplace ergonomics are shaped by employees and the nature of their work. Ergonomic designs should

DOI: 10.15320/ICONARP.2025.330

align with job descriptions, enhance ease of use, optimize tasks, and allow for adaptability and personalization based on the specific requirements of the tasks (Springer, 2007).

To enhance staff efficiency and effectiveness, it is essential to incorporate furniture that can be easily adjusted to meet ergonomic requirements (Chaudhury et al., 2009; Malone & Dellinger, 2011). The use, experience, and comfort provided by furniture in an interior space depend on its ergonomic qualities, which are the basis of human-product relations. Ergonomics, located at the intersection of furniture and human relations, deals with the effects of furniture on the human body and how human movements are affected by it. Ergonomics, which covers every individual, applies universal design principles by addressing users with different needs, including disabled individuals. In healthcare environments, adjustable seats and chairs with armrests can help reduce patient falls, while adequate lighting and configurable furniture can minimize medication errors (Malone & Dellinger, 2011). These standard practices and design strategies will support the creation of healthcare interiors grounded in safety-driven design principles (Reiling et al., 2004).

In some occupations, including medicine and nursing, many diseases, such as musculoskeletal system diseases, are frequent due to the occupation's characteristics and conditions. Besides posture and prevention principles, environmental ergonomic factors also play an important role in determining the prevalence of occupational pain and diseases among healthcare staff (Dıraçoğlu, 2006). Equipment and furniture in patient rooms should be arranged to optimize nurses' mobility and ensure easy access. This is also essential for ensuring optimal performance and fostering a work environment where healthcare professionals can operate effectively, efficiently, and safely. In turn, optimal performance in healthcare directly contributes to higher quality and safer patient care (Carayon et al., 2003).

Layout

Designing a healthcare layout is a complex task due to uncertainties around future patient volumes, patient demographics, and emerging medical technologies. An effective layout must not only align with the hospital's strategic goals but also remain flexible to accommodate evolving needs and unforeseen changes (Vos et al., 2007).

The concept of layout includes both the arrangement of the spaces and the placement of furniture within them. These inevitably impact people and their social interactions as factors that can encourage or discourage social contact. As well as considering social interaction, communication, and isolation, spatial layout has other functions, such as reducing walking distances, providing easy access, enabling visual monitoring, and enhancing the safety of patients. Healthcare is increasingly focused on how hospital design—including technology and equipment—impacts patient safety. Addressing safety issues requires

aligning processes and the physical environment to support staff in delivering safe, effective care (Hughes, 2008). The findings of Vos et al. (2007) underscore the importance of evaluating floor plan design, as the building appears to effectively support system functionality and facilitate intended workflows.

Evans and McCoy (1998) distinguish between sociopetal and sociofugal furniture arrangements. The former refers to arrangements that encourage social interaction through the use of movable elements and strengthen communication with physically comfortable distances and easy eye contact. The latter refers to inflexible arrangements where eye contact is difficult or where distances between people are inappropriate (Evans & McCoy, 1998). Furniture layout and arrangement are also related to spatial proximity, which determines the environmentally shaped limits of people's proximity in social interaction. Proximity studies investigate the position of leaders and small group behaviors (Altman, 1975). In short, furniture arrangements significantly determine the level of socialization in a space. In healthcare spaces, furniture layouts can determine the organization and control of the social relationships that healthcare staff need to establish, both among themselves and with their patients.

In a hospital environment, the spatial layout of each unit should be designed based on specific considerations. The spatial layout areas reserved for patients, visitors, and healthcare staff have different functions to meet different needs. Designing all compartments to be as uniform as possible will help healthcare workers, particularly nurses, quickly adapt whenever they change patients or move to a different area. Key factors, such as proximity to the patient and visual access, as well as job satisfaction and informal learning, should be evaluated at the design stage (Harale, 2010).

Sensory qualities: materials and colors

Sensory qualities, such as the material used and colors, are used to express the quality of an interior and support its function. These elements contribute to the perception of the space while supporting people's actions if they are suitable for the function. Especially for healthcare interiors, furniture requires specific surfaces to perform the activities required in the hospital environment. Therefore, particular attention should be paid to the selection of these elements since color, material, and texture on these surfaces have important effects. Given that the colors used in furniture have a guiding effect on staff and hospital visitors, interior color choices should be made accordingly.

Furniture color choices also have psychological effects on patients and healthcare staff. Color perception is closely linked to a patient's mental and emotional states (Kwon, 2010). Hence, colors should be chosen to encourage healing in patients, increase motivation, and improve the mood of healthcare staff. For example, the use of dominant colors and materials can help avoid a clinical appearance and

DOI: 10.15320/ICONARP.2025.330

differentiate between nursing units (Malkin, 1992). A healing environment offers stimulating yet varied sensory experiences, promoting relaxation through therapeutic sounds, soothing colors, comfortable furniture, and an overall sense of harmony. In healthcare environments, providing pleasant colors and artwork for patients to enjoy while in bed, along with comfortable seating for family members and thoughtfully designed ceiling tiles, enhances the healing atmosphere (Stichler, 2001). Blue, green, and purple are known for their calming and relaxing effects, while pastel hues create a more uplifting atmosphere compared to darker tones. Soft, muted colors without stark contrasts promote relaxation (Cannava, 1994). Duffy and Florell (1990) suggest using softer colors in patient areas, with brighter accents in draperies, upholstery, and artwork to add vibrancy.

Oak counters avoid giving a corporate impression and evoking associated emotions. Nurse station areas should have semi-closed areas with transparent materials to ensure privacy and confidentiality while allowing them to maintain contact with other staff members and monitor patients (Morelli, 2007). The choice of flooring in hospitals significantly affects the safety, health, and comfort of individuals within that environment. Selecting suitable flooring materials for patient rooms depends on the material's composition, its impact on the room's environmental conditions, and its influence on patient comfort and satisfaction (Harris, 2000).

The color of a space significantly influences how environmental features, such as acoustic and thermal conditions, are perceived. For instance, a noise might seem quieter when surrounded by cool colors, whereas the same noise levels can feel more intense in spaces dominated by yellow or red hues (Tofle et al., 2004). Numerous studies have demonstrated that noise significantly impacts human health and well-being, contributing to increased stress, diminished sleep quality, and a rise in headaches. It heightens patient anxiety and undermines their confidence in the clinical competence of staff, while also contributing to falls, confusion, and greater reliance on medications and restraints (Mazer, 2006). Excessive noise can disrupt patients' sleep and trigger harmful physiological responses. For staff, it impairs communication and has been linked to increased errors and burnout (Ampt et al., 2008). These findings highlight the importance of considering noise control in the design of healthcare interiors. Effective noise reduction strategies encompass the use of sound-absorbing ceiling tiles or panels, noise-reducing finishes, and designing single-bed rooms (Ampt et al., 2008; Ulrich et al., 2008).

In conclusion, regarding physical attributes in healthcare environments, ergonomic design, furniture layout, and sensory qualities provided by materials and colors together shape staff efficiency and well-being. Carefully considered furniture layout affects social interactions and work efficiency, ensuring communication and accessibility. Material and color selections impact safety, comfort, and

well-being, highlighting the significance of acoustic control, standardized materials, and visually appealing environments. A holistic approach that combines these components improves the overall experience of healthcare staff.

Psycho-social Attributes

Psycho-social attributes in interior design refer to the ways in which physical spaces influence human emotions, behavior, and social interactions (Karol & Smith, 2018). These attributes play a significant role in shaping users' experiences, particularly in healthcare environments where factors like belonging/personalization and privacy/control can directly impact well-being and performance (Payne et al., 2014). A well-designed space should foster a sense of comfort, security, and autonomy while also enabling appropriate social interactions (Olanusi & Oluwadepo, 2023). In healthcare settings, creating environments that support both patients' and staff's psychological needs can enhance healing processes, reduce stress, and improve overall efficiency (Soh et al., 2015).

The following subtitles explore key psycho-social attributes in detail, including the role of belonging/personalization in fostering emotional connections with spaces, as well as the importance of privacy/control in maintaining comfort and reducing stress. These discussions highlight how thoughtful design interventions can positively influence user satisfaction, staff productivity, and patient recovery.

Belonging/personalization

People's sense of belonging takes the form of emotional, functional, or conceptual connections. While users establish emotional connections with places that are valuable and meaningful to them, they establish a functional connection to perform their activities (Tuan, 1977; Relph, 1976). These physical and psychological needs lead to the concept of personalizing the space.

The users can reinforce their sense of belonging by organizing a space in line with their preferences. Little (1987) studied personality and space relationships through spatial selection and usage. According to Wells (2000), workplace personalization can affect physiological and psychological health.

Personalization is also affected by occupation. People in different occupations may have different tendencies to customize the space (Goodrich, 1986). Lack of personalization can have negative consequences on spaces and users' psychological satisfaction (Wells, 2000). In short, the personalization of space creates a sense of intimacy and helps relieve their worries in their workspace.

Personalization in healthcare interiors is essential for expressing self-identity, which significantly enhances psychological well-being. According to Chrysikou (2014), it is closely tied to critical factors such as privacy, territoriality, and social interaction. Personalization

DOI: 10.15320/ICONARP.2025.330

empowers patients and healthcare staff to manage and protect their personal space, fostering a sense of security and autonomy. Moreover, it facilitates the creation of specialized areas where healthcare staff can efficiently perform their duties or find respite. This approach not only improves the therapeutic environment for patients but also supports the well-being and productivity of healthcare staff (Chrysikou, 2014).

Healthcare staff may find personalization challenging in hospitals. Since each unit is unique, it can make personalization confusing (Shumaker & Reizenstein, 1982). This, in turn, may negatively affect employee performance and the experience of patients and hospital visitors. Thus, the personalization required by hospital staff should be achieved by keeping it as compact as possible and with certain limits.

Privacy/control

According to Levin and Groner (1992), privacy is defined as the condition whereby the ability of others to approach a person or a group is maintained at the optimum level. It encompasses required auditory, visual, and social privacy. People instinctively avoid being visually monitored, and architectural elements such as walls, dividers, and furniture can enhance privacy. Similarly, acoustic privacy can be achieved through ceilings, partitions, and specialized materials (Levin & Groner, 1992).

In hospitals, privacy supports patients, visitors, and staff by fostering security and reducing stress. Since privacy needs vary by unit, spaces should be designed accordingly. Prioritizing patient privacy not only ensures legal compliance but also fosters trust in the confidentiality and quality of care. Equally, staff privacy influences perceptions of safety, supports effective communication, reduces errors, and improves patient outcomes. Acoustic privacy, achieved via panels and strategic layouts, prevents the overhearing of sensitive information, while designated staff-only areas further enhance security. Designating hospital employee-only areas, offices, workstations, and limited-access staff corridors can further address this concern, ensuring a more secure and focused work environment (Zamani et al., 2023).

Hospitals should optimize privacy levels by selecting adaptable furniture and arranging spaces to allow users to control their level of privacy (Evans & McCoy, 1998). The space's spatial qualities balance the level of social interaction, while interior qualities like size and location determine the level of privacy.

A sense of control is a crucial factor that influences stress levels across various user groups and situations (Steptoe & Appels, 1989). People inherently need control and self-efficacy; lacking control can result in high blood pressure, stress, depression, weakened immune function, and passivity. This applies equally in healthcare settings, where a lack of control heightens stress and adversely impacts health. Staff often face high responsibility with low control, exacerbated by

inadequate rest spaces and poorly designed work environments (Shumaker & Pequegnat, 1989; Ulrich, 1997).

In conclusion, regarding psycho-social attributes, personalization, belonging, and privacy play an important role in shaping the well-being and efficiency of healthcare staff. Allowing healthcare staff to personalize their space improves their sense of belonging, creating familiarity and reducing their stress level. Similarly, privacy that is achieved through acoustic control and carefully designed furniture layout encourages autonomy and well-being. Balancing these factors with social interaction confirms that healthcare interiors enhance both psycho-social comfort and functional efficiency and thus improve both efficiency and the overall healthcare experience of staff.

METHODOLOGY

This study focused on the mixed method using quantitative and qualitative methods that complement each other. Here, a qualitative study, including observation and case study, is supplemented by a quantitative study, including research and survey. Primary data were collected through literature review, a questionnaire, face-to-face interviews, and observations of the hospitals. Ethics approval for the study was obtained from [Yaşar University Ethics Committee] (Approval number: 4, dated 21 December 2016), and all participants gave their informed consent prior to data collection. As part of the study, face-to-face questionnaires were conducted with 199 doctors and 453 nurses from the four selected hospitals in İzmir. Based on the reviewed literature, the questionnaire focused on five aspects of the furniture: ergonomic qualities, plan layout, sensory qualities, belonging/personalization, and privacy/control. Some questions employed a 5-point Likert scale ranging from 1 to 5 while others presented the participants with adjective couples, such as warm-cool, comfortable-uncomfortable, hygienic-unhygienic, aesthetic-unesthetic, relaxing-stressful, spacious-crowded, and heavy-light, from which respondents could choose more than one option. Regarding the satisfaction of doctors and nurses for each aspect, there were six questions for ergonomic qualities, two for plan layout, three for sensory qualities, four for belonging/personalization, and four for privacy/control. Stratified simple random sampling was used to select the participants. The required sample size was calculated (Figure 1) based on each hospital's population of doctors and nurses (Table 1). The data were analyzed using SPSS software. In the analysis of the data obtained through the SPSS program, frequency values were taken separately for each area in order to evaluate the satisfaction of doctors and nurses in the areas of their own use, and comparative analyses were excluded.

DOI: 10.15320/ICONARP.2025.330

$$n = \frac{N \times Z^2 \times 0{,}25}{(d^2 \times (N-1)) + (Z^2 \times 0{,}25)}$$

Figure 1. Sample size calculation.

n: sample size required

N: total population size (known or estimated)

d: precision level (usually 0,25 or 0,10)

Z: number of standard deviation units of the sampling distribution corresponding to the desired confidence level

Table 1. Population and required sample size for each hospital.

Hospital	Number of Doctors (Total)	Number of Doctors (Sample)	Number of Nurses (Total)	Number of Nurses (Sample)
Çeşme Hospital	25	7	42	11
Tepecik Hospital	51	14	154	42
Tire Hospital	76	21	137	37
Urla Hospital	47	12	120	32
Total	199	54	453	122

In addition to the questionnaires, 20 staff members (the chief physician or his assistant, two doctors, and two nurses from each of the four hospitals) were interviewed. Purposive sampling was used to identify the required interviewees in line with a qualitative approach (Salmons, 2014). The oral interview results were not segmented into codes; instead, the speeches were assessed qualitatively. This approach allows for a detailed exploration of interview content, capturing nuances and contextual insights without the structured categorization of coding. The data obtained from the four different data collection methods were analyzed in terms of the proposed hypothesis by overlapping each other. The findings from observations, questionnaires, and interviews were then evaluated alongside a literature review conducted as part of this study, as indicated in the conclusion of each analysis section. This analysis is based on the measurement of “heating load”, “cooling load” and the sum of these two loads as "total thermal load" of indoor air temperature and annual energy consumption. Three criteria of heating, cooling, and air temperature are considered to achieve thermal comfort. Finally, the results of the studies are compared, and an optimal example is presented in line with the purpose of the research, as shown in (Table 1).

ANALYSIS

This section presents a comprehensive analysis of the physical and psycho-social attributes of healthcare environments. Each subsection is supported by questionnaire percentage data/results presented in tables,

alongside visual collages and detailed plan diagrams for four selected hospitals and doctors' and nurses' units (Figures 2-17). Direct quotations from participants further enrich the analysis, providing valuable insights into user experiences and perceptions.

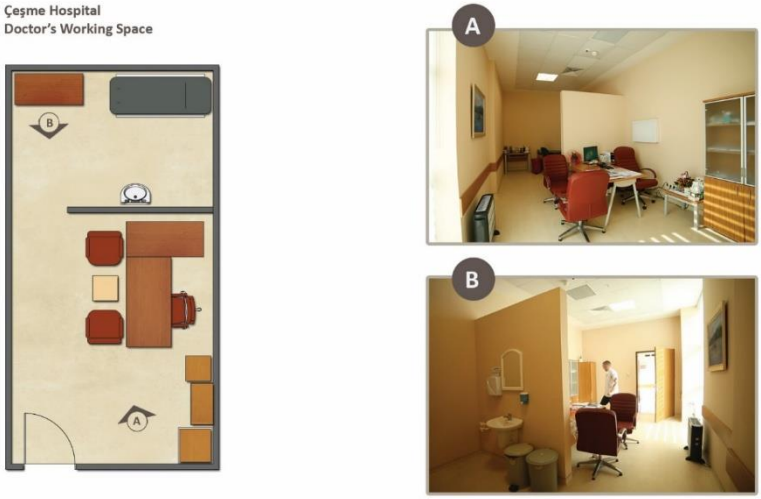


Figure 2. Çeşme Hospital doctor's working space.

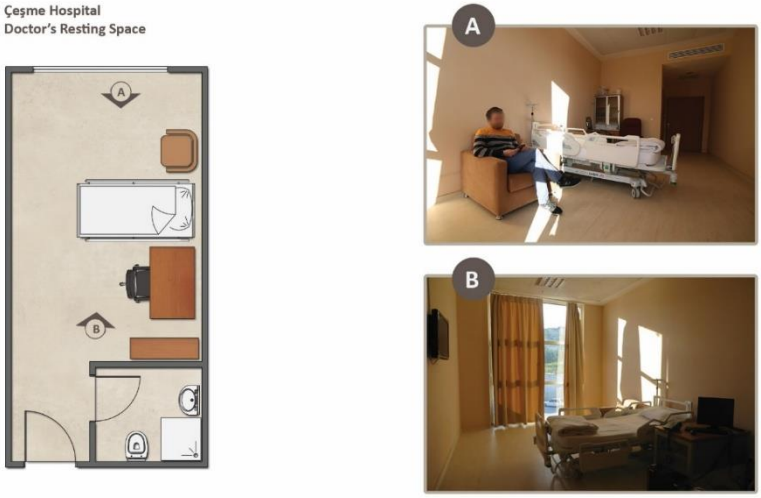


Figure 3. Çeşme Hospital doctor's resting space.

DOI: 10.15320/ICONARP.2025.330

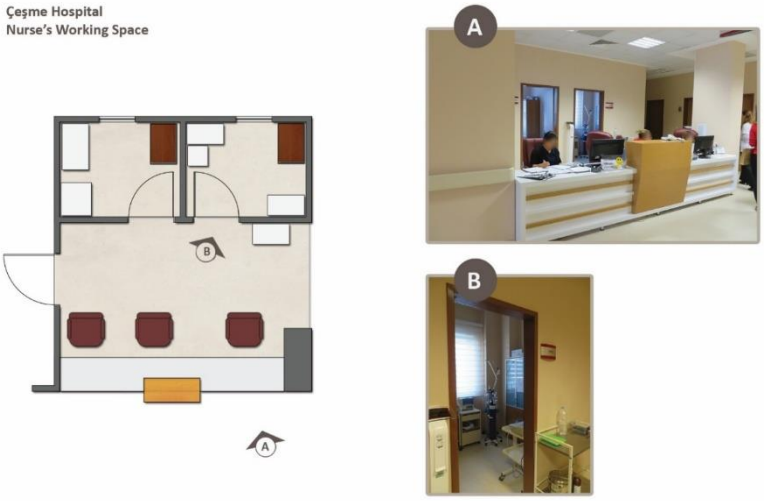


Figure 4. Çeşme Hospital nurse's working space.

Figure 5. Çeşme Hospital nurse's resting space.

Figure 6. Tepecik Hospital doctor's working space.

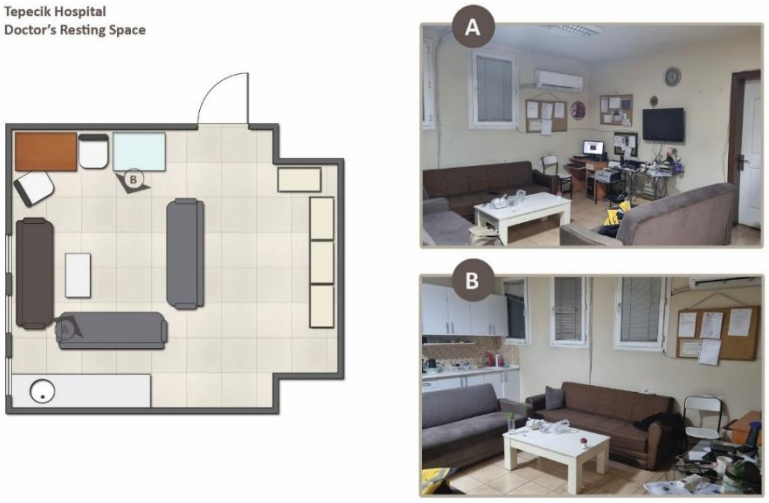


Figure 7. Tepecik Hospital doctor's resting space.

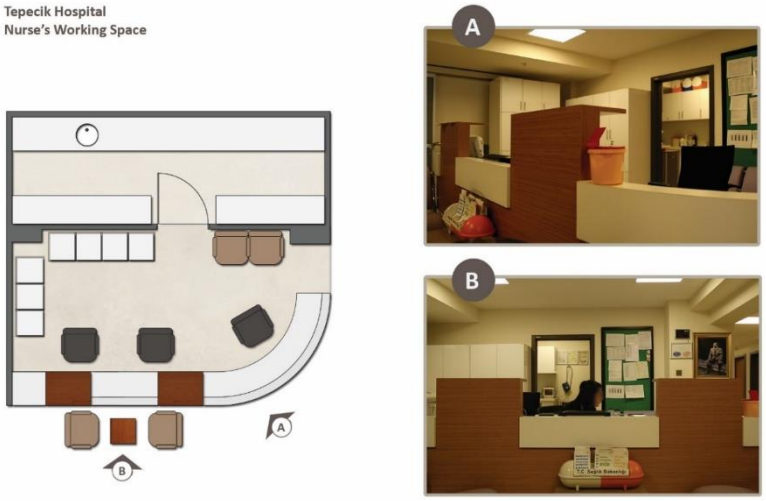


Figure 8. Tepecik Hospital nurse's working space.

Figure 9. Tepecik Hospital nurse's resting space.

DOI: 10.15320/ICONARP.2025.330

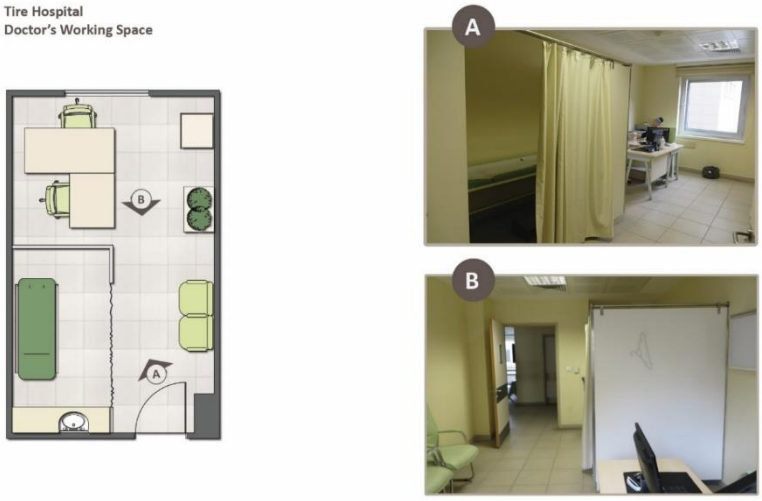


Figure 10. Tire Hospital doctor's working space.

Figure 11. Tire Hospital doctor's resting space.

Figure 12. Tire Hospital nurse's working space.

Figure 13. Tire Hospital nurse's resting space.

Figure 14. Urla Hospital doctor's working space.

Figure 15. Urla Hospital doctor's resting space.

DOI: 10.15320/ICONARP.2025.330

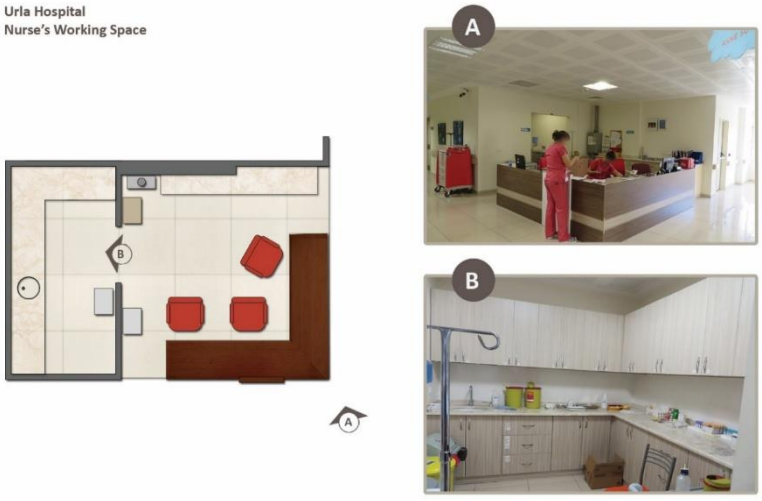


Figure 16. Urla Hospital nurse's working space.

Figure 17. Urla Hospital nurse's resting space.

Physical Attributes

The physical attributes of healthcare staff areas play a critical role in shaping both comfort and functionality for healthcare professionals. This subsection evaluates these physical elements in detail, focusing on their ergonomic qualities, spatial organization, and sensory characteristics, based on both quantitative survey data and qualitative staff feedback across four different hospitals.

Ergonomic qualities

Regarding the seating material, a significant portion of doctors across hospitals found the seating in working and resting areas comfortable, although a notable number reported discomfort specifically with the resting area seating (Table 2). Nurses' comfort levels with seating material varied among the hospitals. Overall, leather was preferred for workspaces, whereas fabric was in resting spaces.

Table 2. Questionnaire percentage results for "comfortable seating element" (DW: doctor working area, DR: Doctor resting area, NW: Nurse working area, NR: Nurse resting area, SD: Strongly disagree, D: Disagree, N: Neutral, A: Agree, SA: Strongly agree).

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	-	-	-	-	-	-	21,7	26,1	-	-	18,4	18,4	-	-	26,7	13,3
D	12,5	25	15,4	23,1	38,5	30,8	19,6	13	23,8	28,6	47,4	44,7	42,9	28,6	33,3	23,3
N	25	25	23,1	15,4	15,4	23,1	8,7	4,3	23,8	9,5	10,5	13,2	-	-	23,3	23,3
A	25	12,5	30,8	30,8	38,5	30,8	32,6	41,3	42,9	52,4	15,8	15,8	42.9	57,1	13,3	36,7
SA	37,5	37,5	30,8	30,8	7,7	15,4	17,4	15,2	9,5	9,5	7,9	7,9	14,3	14,3	3,3	3,3

Opinions on the ergonomic characteristics of the seating units (e.g., size and form) varied across hospitals and between nurses and doctors (Table 3). ÇH doctors had the highest level of agreement regarding the ergonomic suitability of the seating. A TEH doctor mentioned that the lounge seating was uncomfortable and not suitable for resting. Regarding ergonomic suitability, nurses from ÇH generally gave more positive evaluations for seating in both areas, while feedback from nurses at TEH, UH, and TIH was more mixed, with fewer reporting a positive experience. A UH nurse noted issues such as improper screen height, lack of lumbar and foot support, and poor alignment of chairs, tables, and monitors—citing back and neck pain as a result. Similarly, a TIH nurse criticized the fixed, heavy furniture and the lack of adjustable chairs. As the literature suggests, ergonomically inappropriate furniture triggers musculoskeletal diseases, indicating potential harm in UH, TIH, and TEH workspaces.

Table 3. Questionnaire percentage results for "ergonomic characteristics of the seating units".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	-	-	7,7	7,7	7,7	7,7	26,1	30,4	14,3	4,8	21,1	23,7	-	-	13,3	10
D	25	25	7,7	7,7	23,1	30,8	17,4	19,6	28,6	23,8	39,5	36,8	42,9	28,6	26,7	33,3
ND	-	-	23,1	23,1	7,7	7,7	13	6,5	4,8	14,3	10,5	10,5	-	14,3	13,3	13,3
A	50	50	46,2	46,2	46,2	46,2	34,8	39,1	47,6	42,9	26,3	28,9	57,1	57,1	46,7	36,7
SA	25	25	15,4	15,4	15,4	7,7	8,7	4,3	4,8	14,3	2,6	-	-	-	-	6,7

Regarding the ergonomic suitability of tables, most doctors at ÇH, TEH, and TIH gave positive evaluations for the workspaces, while a

DOI: 10.15320/ICONARP.2025.330

slightly smaller portion did so for the resting areas. At TEH, fewer nurses found the desks to be ergonomically appropriate (Table 4).

Laminate coating was the main tabletop material in all hospitals, and TIH received the highest number of positive evaluations regarding its comfort. In some doctors' rooms, the desks had light-colored, laminated metal legs; in others, the desks were made of dark, solid wood. In ÇH, many doctors and a good number of nurses were satisfied with the ergonomics of the chairs, as they offered adjustable height and features such as back, waist, and neck support. A moderate level of satisfaction was also observed among staff in TIH, UH, and ÇH.

Most doctors in ÇH, TEH, and TIH expressed satisfaction with the ergonomic design of their desks, whereas in UH, a notable portion of doctors reported dissatisfaction. Doctors mentioned standard desk dimensions, printer placement, and limited leg movement under-desk caissons as key issues. Across all hospitals, many doctors found the tables in the resting areas to be ergonomically satisfactory (Table 4).

In ÇH and TEH, a considerable number of nurses were satisfied with the coffee tables in the resting areas. However, satisfaction was noticeably lower in UH and TIH. The main concerns were that the tables were too small, too low, and had irregular shapes. They were selected for visual harmony rather than ergonomic suitability.

Table 4. Questionnaire percentage results for "ergonomic suitability of tables".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	-	-	-	-	-	-	17,4	21,7	-	4,8	10,5	18,4	-	14,3	16,7	20
D	25	25	38,5	38,5	15,4	23,1	17,4	10,9	14,3	19	39,5	52,6	42,9	28,6	33,3	40
ND	-	12,5	23,1	15,4	15,4	15,4	17,4	21,7	14,3	14,3	18,4	15,8	-	-	10	10
A	37,5	37,5	15,4	23,1	53,8	61,5	34,8	39,1	61,9	47,6	28,9	13,2	57,1	57,1	40	30
SA	37,5	25	23,1	23,1	15,4	-	13	6,5	9,5	14,3	2,6	-	-	-	-	-

Regarding the ergonomic suitability of workspace storage units, doctors in TIH gave the most positive feedback, followed by those in ÇH, UH, and TEH, with satisfaction levels varying across hospitals. Among nurses, satisfaction with storage unit ergonomics in ÇH and TEH was moderate (Table 5). When it came to the size and number of storage units in workspaces, doctors across hospitals expressed varying degrees of satisfaction, generally falling within a similar range (Table 6). A TEH doctor noted the need for an additional cabinet for personal items in outpatient clinics. Among nurses, those in ÇH and TEH reported greater satisfaction compared to their counterparts in TIH and UH. Supporting these results, UH nurses emphasized the need for closed storage to reduce infection risk, particularly for storing personal items and drinks.

Table 5. Questionnaire percentage results for "ergonomic suitability of the storage units".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	12,5	-	7,7	-	7,7	7,7	21,7	26,1	-	-	28,9	31,6	-	-	16,7	13,3
D	37,5	50	15,4	23,1	46,2	61,5	15,2	17,4	23,8	38,1	31,6	31,6	28,6	28,6	40	33,3
ND	-	12,5	30,8	38,5	7,7	7,7	10,9	13	9,5	9,5	23,7	18,4	28,6	42,9	30	26,7
A	25	12,5	23,1	15,4	23,1	15,4	43,5	39,1	57,1	42,9	15,8	18,4	42,9	28,6	13,3	26,7
SA	25	25	23,1	23,1	15,4	7,7	8,7	4,3	9,5	9,5	-	-	-	-	-	-

Table 6. Questionnaire percentage results for "adequacy of size and number of workspace storage units".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	12,5	12,5	7,7	7,7	-	-	21,7	23,9	9,5	4,8	18,4	21,1	-	-	13,3	20
D	37,5	37,5	15,4	15,4	30,8	46,2	15,2	19,6	14,3	33,3	31,6	42,1	28,6	28,6	30	26,7
ND	-	-	23,1	23,1	7,7	7,7	8,7	10,9	9,5	19	13,2	10,5	14,3	28,6	20	16,7
A	37,5	37,5	30,8	23,1	38,5	23,1	41,3	32,6	52,4	28,6	34,2	23,7	57,1	42,9	36,7	36,7
SA	12,5	12,5	23,1	30,8	23,1	23,1	13	13	14,3	14,3	2,6	2,6	-	-	-	-

In UH, one doctor emphasized that ergonomics was the most important furniture criterion. Another highlighted four key parameters—ergonomics, durability, visual appeal, and cleanability—noting that all are interconnected. He stressed that in hospital settings, easy-to-clean and body-compatible materials are essential for both hygiene and user health, while visual appeal affects psychological well-being. Durability was also seen as crucial for long-term usability and cost-effectiveness.

In healthcare interiors, meeting the needs of staff is as important as meeting those of patients. This supports staff efficiency, safety, and well-being in both work and rest. Survey and interview findings, along with existing literature, highlight that easily adjustable, ergonomically designed furniture can improve staff performance. Given the physical demands of medical and nursing work, musculoskeletal diseases are common. Beyond posture and prevention practices, environmental ergonomic factors play a significant role in the occurrence of work-related pain and illness among healthcare staff.

Leather seating is appropriate in hospitals where hygiene, durability, antibacterial properties, and easy maintenance are priorities. However, such materials may be perceived as visually and functionally

DOI: 10.15320/ICONARP.2025.330

uncomfortable in certain contexts due to limited fabric quality and color variety. Conversely, while fabric seating in resting areas may offer more visual comfort, it poses higher risks of infection and bacterial transmission.

The analysis can be summarized as follows:

- Comfort: Materials and colors affect spatial perception and functionality. When appropriately selected, they support activities. Laminate is effective for tabletops, balancing function and aesthetics.
- Ergonomics: Well-designed seating, tables, and workspace desks enhance staff efficiency, safety, and rest by addressing size and form.
- Storage: Staff need versatile storage units in both work and rest areas to accommodate institutional and personal items efficiently.

Key design recommendations emphasize that seating, tables, and work desks should be ergonomically designed to support posture, offer adjustability, and incorporate comfortable materials to reduce musculoskeletal problems and enhance staff well-being. Additionally, future furniture design should balance ergonomics, durability, aesthetics, and ease of cleaning to better support healthcare professionals.

Layout

Except for UH, more doctors than nurses found the furniture layout in all spaces functionally convenient. The proportions of positive and negative responses were similar for doctors and nurses (Table 7). Most of the ÇH doctors agreed that the furniture layout was appropriate for the functions, in contrast to the UH doctors.

The nurses' opinions about the furniture layout varied between hospitals. For all spaces, nearly half of UH nurses did not find the furniture layout appropriate, while a majority of TIH nurses found it inappropriate. UH nurses stated that they had no need for flexibility in furniture placements in their workplace, emphasizing that a fixed layout ensures order, supports habitual use, and enables quicker access to patients.

Table 7. Questionnaire percentage results for "appropriateness of furniture layout for the functions".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	12,5	12,5	-	-	7,7	23,1	23,9	30,4	-	4,8	13,2	21,1	14,3	14,3	13,3	13,3
D	-	12,5	38,5	30,8	23,1	7,7	8,7	21,7	14,3	4,8	52,6	57,9	28,6	28,6	30	33,3
ND	-	-	23,1	30,8	-	7,7	8,7	4,3	14,3	28,6	5,3	5,3	14,3	28,6	23,3	13,3

A	50	37,5	30,8	30,8	61,5	61,5	52,2	37	47,6	47,6	28,9	15,8	42,9	28,6	33,3	40
SA	37,5	37,5	7,7	7,7	7,7	-	6,5	6,5	23,8	14,3	-	-	-	-	-	-

Except in UH, more nurses than doctors perceived furniture density as high. In TIH, both groups reported lower density, suggesting better circulation compared to other hospitals. As shown in Table 8, more doctors in ÇH and UH reported high furniture density across all spaces. All ÇH nurses shared this view, whereas TIH nurses did not.

A ÇH nurse stated that workspaces were narrow, desks resembled secretarial counters, and space was insufficient for multiple users. She also emphasized the lack of a sink and storage, forcing her to place a medicine fridge in the break room. Similarly, a TEH nurse stated that the work desks were too small and the resting rooms too crowded, preventing all staff from sitting together. Many nurses at TEH and a significant portion at UH reported that the resting areas had a high density of furniture.

Table 8. Questionnaire percentage results for "appropriateness of density of furniture".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
SD	-	-	-	-	-	-	15,2	15,2	4,8	-	18,4	21,1	-	-	3,3	6,7
D	25	25	23,1	23,1	53,8	46,2	43,5	28,3	66,7	76,2	44,7	36,8	42,9	42,9	40	26,7
ND	37,5	37,5	30,8	38,5	15,4	7,7	8,7	6,5	19	19	13,2	10,5	-	14,3	16,7	20
A	37,5	37,5	23,1	15,4	23,1	30,8	21,7	34,8	9,5	4,8	18,4	21,1	42,9	28,6	30	33,3
SA	-	-	23,1	23,1	7,7	15,4	10,9	15,2	-	-	5,3	10,5	14,3	14,3	10	13,3

This study's findings reinforce that tailored furniture layouts and densities in healthcare environments are critical. Inappropriate placements impair social interaction and reduce staff's control over communication. Furniture should meet such needs rather than prioritize density and suitability.

The analysis can be summarized as follows:

- Functionality and Efficiency: Positive feedback highlights that effective layouts support operations. Conversely, some negative comments indicate workflow problems resulting from poor spatial arrangements.
- Social Interaction: Sociopetal setups enhance communication and satisfaction; sociofugal arrangements may hinder interaction and lower satisfaction.
- Flexibility and Adaptability: Feedback emphasizes the need for adaptable furniture to meet spatial and functional

DOI: 10.15320/ICONARP.2025.330

demands; lack of flexibility affects workflow, especially in treatment and storage areas.

- Density and Comfort: Perceptions vary; high density — particularly in nurses' stations— can hinder movement and reduce satisfaction and efficiency.

The design recommendations include promoting adaptable furniture arrangements for diverse healthcare spaces, addressing space limitations, visibility, and accessibility to essential amenities, and focusing on staff satisfaction, operational efficiency, and social dynamics. Future design should prioritize functionality, ergonomic comfort, and functionality to support varied workflows and improve care delivery quality.

Sensory qualities: Materials and colors

The participants were asked to match their expectations of the upholstery material of the seating elements with the adjectives (Table 9). The most frequently matched adjective for the seating elements used by doctors and nurses regarding all spaces was "simple". The least matched adjective for the upholstery material was "slippery". Among the adjectives questioned, the most preferred ones were "bright" for the TEH doctors' workspace, "slippery" for the TIH nurses' workspace, "textured" for the TEH doctors' resting space, and "patterned" for the UH doctors' resting space (Table 9).

Table 9. Questionnaire percentage results for "expectations of the upholstery material of the seating elements".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
bright	-	-	-	-	30,8	7,7	17,4	17,4	-	9,5	13,2	10,5	28,6	28,6	-	3,3
slippery	12,5	12,5	-	-.	-	-	-	-	9,5	9,5	15,8	10,5	-	-	6,7	
textured	37,5	12,5	15,4	23,1	30,8	53,8	28,3	30,4	19	38,1	28,9	34,2	14,3	-	40	26,7
patterned	-.	25	15,4	15,4	7,7	15,4	10,9	23,9	-	9,5	13,2	21,1	28,6	42,9	3,3	13,3
simple	87,5	75	69,2	61,5	61,5	30,8	69,6	54,3	85,7	47,6	55,3	50	57,1	57,1	70	73,3

For table surfaces, "patterned" was the most selected; "slippery" was the least. Among the adjectives questioned, the most preferred ones for "bright" were TEH doctors' resting space, "slippery" for the UH doctors' workspace, and "textured" for the TEH doctors' resting space (Table 10).

Table 10. Questionnaire percentage results for "expectations of the table surface materials".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
bright	25	25	15,4	15,4	30,8	38,5	34,8	37	4,8	14,3	21,1	15,8	14,3	14,3	13,3	13,3
slippery	12,5	12,5	-	-.	-	-	8,7	6,5	4,8	9,5	23,7	13,2	42,9	28,6	-	-
textured	25	12,5	15,4	23,1	30,8	30,8	19,6	17,4	4,8	9,5	13,2	26,3	14,3	14,3	13,3	10
patterned	50	75	76,9	69,2	69,2	53,8	71,7	71,7	95,2	81	65,8	63,2	71,4	85,7	83,3	86,7
simple	-	-	-	-	38,5	-	-	-	-	-	-	-	-	-	-	-

Participants chose the top three preferred colors for furniture based on the options in Tables 11 and 12. ÇH participants gave the clearest preferences in that the first color preference of most doctors for working and resting spaces was D141-Ash Gray, followed by A319-Maple and A415-Bianco. The majority of ÇH nurses preferred the workspaces A338-Venetian Walnut and A415-Bianco, followed by A339-Newish Oak and D140-Pebble, and D126-Cappuccino. For the resting spaces, the nurses most preferred A415-Bianco and D102-Beige, followed by D104-Ivory and D126-Cappuccino.

Table 11. Codes of wood colors.

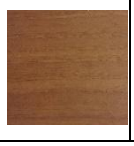
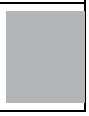
A319 Maple	A338 Venetian Walnut	A339 Newish Oak	A348 Ihlara	A402 Natural Oak	A412 Arcadia	A415 Bianco
						

Table 12. Codes of solid colors.

D102 Beige	D104 Ivory	D108 Blue	D120 Pink	D125 Candy Pink	D126 Cappuccino	D129 White Lacquer	D135 Verde	D140 Pebble	D141 Ash Gray
									

These findings underscore the importance of varied material surfaces and colors for furniture elements within hospital environments. Effective healthcare interior design relies on the integration of materials and colors that support both functional needs and sensory experiences. Doctors and nurses typically favor plain upholstery for seating elements but show a preference for patterned materials for tables. Slippery materials are seldom preferred for either seating or tables. In terms of colors, hospital staff generally gravitate

DOI: 10.15320/ICONARP.2025.330

towards neutral hues like creams and browns across all spaces, although staff at UH exhibit a preference for candy pink, pink, and blue tones. These preferences highlight a balance sought by hospital staff between functionality and aesthetic appeal in material choices.

The analysis can be summarized as follows:

- Functional Materials Selection: Upholstery and table surface preferences reflect a desire for simplicity and patterned textures, emphasizing practicality and ease of maintenance. Materials should balance aesthetic appeal with functionality to support healthcare activities and patient comfort.
- Color Psychology and Mood Enhancement: Healthcare interiors should consider color choices carefully to create environments conducive to relaxation and stress reduction while avoiding stimulating colors.
- Adaptive Design Choices: Upholstery preferences indicate a need for comfort and privacy, crucial for patient and staff satisfaction.

The design recommendations include using calming colors and durable and easy-to-maintain materials, enhancing safety and privacy, and promoting adaptability and evidence-based practices to support effective and comforting care environments.

Psycho-social Attributes

The psycho-social attributes of work and rest environments are essential for supporting staff satisfaction, identity, and performance. Drawing on questionnaire results and interviews, the findings emphasize that designed interiors contribute not only to physical comfort but also to psychological security, motivation, and a sense of ownership in the workplace.

Belonging/personalization

To evaluate sense of belonging in their working and resting spaces, the participants responded to positive-negative adjective pairs (Table 13). The effect of warmth was evaluated for seating elements, table materials, and furniture color. UH doctors most frequently rated the seating elements in their workspaces as warm, while fewer nurses in TEH and UH did so. Regarding the seating elements in the resting spaces, a larger proportion of UH doctors and nurses rated them as warmer than in the other hospitals. Regarding the table materials, doctors in TEH and ÇH were most likely to rate the workspace as warm. Nurses in ÇH mostly like to evaluate their workspace desk materials as warm. A UH doctor emphasized the importance of furniture material for a sense of belonging: “It is definitely effective in adopting bad materials, but the materials are of a normal standard; the standards in recent years are suitable for the working environment.” Regarding the warmth of furniture colors, the largest proportion of positive ratings was in ÇH. Regarding the sense of belonging, ÇH nurse stated that she prefers an

atmosphere close to the home environment, which the hospital can create through the colors and textiles used.

Table 13. Questionnaire percentage results for "the effect of surface materials of the sitting units".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
warm	12,5	25	15,4	15,4	23,1	30,8	19,6	19,6	14,3	9,5	2,6	2,6	28,6	57,1	16,7	20
cool	12,5	25	-	-	23,1	23,1	4,3	4,3	28,6	14,3	15,8	15,8	-	-	16,7	20
comfortable	87,5	75	61,5	53,8	53,8	69,2	50	54,3	47,6	76,2	34,2	42,1	42,9	42,9	33,3	53,3
uncomfortable	-	-	23,1	23,1	23,1	23,1	47,8	41,3	14,3	4,8	63,2	52,6	57,1	42,9	43,3	30
hygenic	37,5	37,5	15,4	15,4	30,8	7,7	19,6	15,2	23,8	14,3	10,5	5,3	14,3	14,3	3,3	10
unhygenic	-	-	7,7	7,7	7,7	7,7	32,6	30,4	4,8	-	18,4	23,7	28,6	28,6	13,3	6,7
aesthetic	50	50	7,7	15,4	23,1	23,1	30,4	30,4	14,3	19	5,3	2,6	14,3	28,6	10	23,3
unaesthetic	25	37,5	30,8	30,8	38,5	38,5	41,3	34,8	28,6	23,8	42,1	39,5	42,9	28,6	33,3	20

For seating material hygiene, the largest proportion of positive responses among doctors was in ÇH for the working and resting spaces. For nurses, it was in TEH for the workspace and in ÇH and in TEH for the resting space. Regarding table material hygiene, the largest proportion of positive evaluations among doctors was in TEH for working and resting. For nurses, it was in ÇH. In terms of the aesthetics of the seating elements, ÇH had the highest proportions of positive responses among doctors for the working and resting spaces, whereas TEH had the largest proportions among nurses for the working and resting spaces.

Regarding the relaxing effect of furniture colors, ÇH had the largest proportion of positive responses for all spaces for doctors and nurses. The relaxing effect of the table materials and the proportions of positive responses were similar for all spaces.

One of the TEH nurses stated that this hospital had the strongest feeling of belonging among those she had worked at and how she feels at home, which significantly affects her work performance. She stated that modular furniture allows for different uses, while sliding door systems in the drug preparation room would reduce space loss.

One of the TEH doctors stated that the furniture followed standard designs in state hospitals and that it was not possible to personalize it by arranging the room according to his needs, such as a refrigerator, coffee machine, and glasses. Another doctor at TEH said that the furniture in the workspaces provided a sense of belonging to the place. Similarly, among nurses, one UH nurse felt a sense of belonging in the workspace: "I feel like I have my own workspace. Of course, I live there."

Regarding seating materials, the participants did not prefer leather in their working and resting spaces, although it feels hygienic. Although

DOI: 10.15320/ICONARP.2025.330

the same material (PVC-coated wood) was used in all four hospitals, the light surface colors (maple, etc.) of the table materials gave doctors and nurses a sense of warmth, hygiene, and relaxation. Thus, the light-dark balance of furniture colors must be well-adjusted. Doctors and nurses found their working and resting spaces more spacious, light, and hygienic if light tones were used. Regarding the furniture plan layout, doctors found their workspaces more spacious and relaxing if the part for examining patients was screened off by a vertical separator.

The findings support the literature in that user and space are in a connection emotionally and functionally. Only if the psycho-social and physical needs are met could it be possible to talk about personalization in a space. The adjectives that the study determines as a holistic approach (physical and psycho-social) can give personalization to a space. As revealed from the findings, healthcare staff prefer warm colors for seating elements in terms of personalization in their working and resting areas. When it comes to the table surface, the healthcare staff evaluates lighter colors more personally. They claim that the standard can meet physical needs, but it is not enough for psycho-social needs.

The analysis can be summarized as follows:

- Color Effect: Light colors on tables and warm colors on seating elements make people feel more warmth and are preferred by healthcare staff in the sense of belonging.
- Workspace Personalization: However, the standards define many elements in a healthcare environment, and staff needs more control capability for expressing more of their self-identity.

The design recommendations include supporting staff identity through diverse preferences, using clean-looking surfaces to enhance hygiene and belonging, and balancing spatial elements to foster personalization.

Privacy/control

Regarding the role of the furniture layout in defining borders, nearly half of TEH and UH doctors responded positively about the workspaces, most of UH doctors for the resting space, and nearly half of TIH nurses for the working and resting spaces, respectively (Table 14).

Table 14. Questionnaire percentage results for "the role of the furniture layout in defining borders".

	ÇH				TEH				TIH				UH			
	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR	DW	DR	NW	NR
Border	12,5	12,5	30,8	30,8	46,2	30,8	32,6	37	28,6	23,8	44,7	47,4	42,9	71,4	23,3	33,3

One of the ÇH doctors said that the table created a border between doctor and patient, and this formal arrangement helps in being taken seriously by the patient. The ÇH chief physician stated that he did not prefer furniture to create borders and that he was not bothered by close

contact with people due to his working style and habits. One ÇH nurse stated that the slightly higher work desk is suitable for one-to-one meetings with patients, while another nurse found a desk at table height problematic as it allows direct contact with patients or their relatives.

TEH Deputy Chief Physician reported feeling discomfort because the furniture arrangement in his study room meant that personnel bringing documents could come directly to him and see the computer screen. TIH Deputy Chief Physician stated that the border function of the furniture is important, that he wanted to see the door from where he sits, and that he saw the table as a protective element. TIH nurses stated that they were satisfied with the height of the work desk and were not disturbed by it, as patient contact was necessary.

The UH Chief Physician thought that the furniture arrangement is important for security and borders. He said that the table should be a border between him and the patient, but in its current position, patients can approach his individual space.

One of the UH doctors stated that a wide table creates a border between doctor and patient. An UH nurse said placing the counter in the workspace corner creates a border by preventing patients from approaching. Doctors preferred a vertical divider to separate the patient examination area. A TEH doctor stated that, "I would like a curtain while I examine. It is a desired limit. But if there is no patient, I definitely open the curtain, because the place becomes spacious."

It could be possible to evaluate from the interview data that some healthcare staff perceive the term "border" positively regarding security and privacy, whereas others do not. As mentioned in the literature, the space reinforces the privacy effect while creating a personal zone for people. The former believe that their work desks create a positive border between them and the patients, and some require these tables to be of optimal height and width for efficient working, given the role of the work desk in direct contact with patients. The participants' concerns about borders in their workspace were ensuring privacy for them and the patient.

The analysis can be summarized as follows:

- The border is perceived mostly positively by the healthcare staff: the healthcare staff, especially nurses, prefer more height in nurse desks for controlling their privacy.
- Furniture size, dimensions, and layout are important parameters for providing borders. The corners, the width, or the length of the table can be a critical piece of furniture for controlling healthcare staff's borders.
- Staff generally express a preference for boundaries with patients: Doctors and nurses emphasize the role of furniture in creating separation between themselves and patients.

The design recommendations include ensuring doctor privacy by positioning tables to block patient views of screens and designing nurse

DOI: 10.15320/ICONARP.2025.330

desk heights to limit excessive direct contact while maintaining effective communication.

CONCLUSION

As our understanding of architecture expands, we recognize the responsibility of designers to promote individual well-being. As reported in the literature and hypothesized in the present study, enhancing the physical and psycho-social attributes of furniture in the hospital working and resting spaces of doctors and nurses can increase their spatial satisfaction. The study's findings thus fill an important gap in knowledge regarding the interior design factors that influence their physical and mental health and raise awareness about using interior design to create healthy, safe, and comfortable hospital environments.

From a spatial perspective, the study underscores the importance of furniture selection and adaptable layouts in creating efficient healthcare environments. The study also highlights unit-specific challenges, such as the difficulty of achieving privacy in shared staff rooms, the impact of noise in high-traffic areas, and the lack of spatial personalization options in standardized hospital settings. From a psycho-social perspective, the study findings indicate that well-designed hospital spaces help reduce stress, fatigue, and emotional exhaustion of healthcare staff by promoting a sense of control, privacy, and personalization.

The research and analysis conducted in the field study demonstrated that the four components of the methodology (literature review, field trips, structured questionnaires, and semi-structured interviews) complemented each other, emphasizing the importance of considering the needs of healthcare staff and highlighting furniture design as a crucial element influencing user satisfaction in healthcare interiors.

Previous research strongly suggests that the interiors of well-designed healthcare facilities have a positive and curative effect on staff and patients; therefore, it should be addressed comprehensively. The conclusions of this study can be transformed into criteria to guide the design of healthcare staff spaces, which will greatly benefit health administrators, healthcare staff, other decision-makers, and individuals in the healthcare industry, as well as designers and design students. In short, the study findings will increase awareness of the significance of design quality in healthcare working and resting environments.

Acknowledgement

This study is a part of the Scientific Research Project (BAP 048) supported by Yaşar University, entitled "Healthcare Interiors: Space Perception and Satisfaction of the Healthcare Staff Towards the Quality of Working and Resting Spaces in Healthcare Buildings."

REFERENCES

Altman, I. (1975). *The Environment and Social Behavior: Privacy, Personal Space, Territory, and Crowding*. Brooks/Cole Publishing.

Ampt, A., Harris, P., & Maxwell, M. (2008). *The Health Impacts of the Design of Hospital Facilities on Patient Recovery and Wellbeing, and Staff Wellbeing: A Review of the Literature*. Centre for Primary Health Care and Equity, University of New South Wales.

Attaianese, E., & Duca, G. (2012). Human factors and ergonomic principles in building design for life and work activities: An applied methodology. *Theoretical Issues in Ergonomics Science, 13*(2), 187-202.

Cannava, E. (1994). "Gerodesign": Safe and comfortable living spaces for older adults. *Geriatrics, 49*(11), 45–49.

Carayon, P., Alvarado, C. J., & Hundt, A. S. (2003). *Reducing Workload and Increasing Patient Safety Through Work and Workspace Design*. Center for Quality and Productivity Improvement, University of Wisconsin-Madison.

Chaudhury, H., Mahmood, A., & Valente, M. (2009). The effect of environmental design on reducing nursing errors and increasing efficiency in acute care settings: A review and analysis of the literature. *Environment and Behavior, 41*(6), 755-786.

Ching, F. D. K. (2007). *Architecture: Form, Space, and Order*. John Wiley & Sons.

Chrysikou, E. (2014). *Architecture for Psychiatric Environments and Therapeutic Spaces*. IOS Press.

Dıraçoğlu, D. (2006). Sağlık personelinde kas-iskelet sistemi ağrıları. *Türkiye Klinikleri Tıp Bilimleri Dergisi, 26*(2), 132-139.

Duffy, T.M., & Florell, J.M. (1990). Intensive care units. *J Health Care Interior Design, 2*, 167–179.

Evans, G. W., & McCoy, J. M. (1998). When buildings don't work: The role of architecture in human health. *Journal of Environmental Psychology, 18*(1), 85-94.

Goodrich, R. (1986). The perceived office: The office environment as experienced by its users. In J. D. Wineman (Ed.), *Behavioural Issues in Office Design*. Van Nostrand Reinhold.

Harale, K. B. (2010). *The role of design in communication, interaction and teamwork.* (Unpublished master's thesis). Cornell University.

Harris, D. (2000). *Environmental Quality and Healing Environments: A Study of Flooring Materials in a Healthcare Telemetry Unit* [Unpublished doctoral dissertation]. Texas A&M University.

Hughes, R. G. (2008). *Patient Safety and Quality: An Evidence-Based Handbook for Nurses*. AHRQ Publication.

Iyendo, T. O. (2016). Exploring the effect of sound and music on health in hospital settings: A narrative review. *International Journal of Nursing Studies, 63*, 82-100.

Jablonska, J., & Furmanczyk, J. (2024). Healing Architecture in Mental Health Facilities in the New European Bauhaus Context. *Buildings, 14*(4), 1056.

Karol, E., & Smith, D. (2018). Impact of Design on Emotional, Psychological, or Social Well-Being for People with Cognitive Impairment. *HERD*, *12*(3), 220-232. https://doi.org/10.1177/1937586718813194.

Kwon, J. (2010). *Cultural Meaning of Color in Healthcare Environments: A Symbolic Interaction Approach* [Unpublished doctoral dissertation]. University of Minnesota.

Levin, B. M., & Norman E. G. (1992). *Human Behavior Aspects of Staging Areas for Fire Safety in GSA Buildings*. NIST GCR 92-606, NIST, Gaithersburg, MD.

Little, B. R. (1987). Personality and the environment. In D. Stokols & I. Altman (Eds.), *Handbook of Environmental Psychology* (pp. 206-237). John Wiley.

DOI: 10.15320/ICONARP.2025.330

Malkin, J. (1992). *Hospital Interior Architecture: Creating Healing Environments for Special Patient Populations*. Van Nostrand Reinhold Company.

Malone, E. B., & Dellinger, B. A. (2011). *Furniture Design Features and Healthcare Outcomes*. The Center for Health Design.

Mazer, S. E. (2006). Increase patient safety by creating a quieter hospital environment. *Biomedical Instrumentation & Technology, 40*(2), 145-146.

Morelli, A. (2007). Implications of nursing station design on nurses' psychosocial health and work behavior. Master's Thesis, Environmental Psychology D.

Olanusi, J. A., & Oluwadepo, O. A. (2023). Behavioural Impact of Interaction Spaces Approach in Architectural Design. *International Journal of Research and Innovation in Social Science*, *VII*(VII), 2067–2079. https://doi.org/10.47772/ijriss.2023.70865.

Osonwa, E. C. (2023). *Healing through architecture: The impact of architecture in the process of healing and well-being in therapeutic resorts. International Journal of Innovative Environmental Studies Research, 11*(4), 65-69.

Özel, Y. (2021). İç mekân kurgusunda mobilya ve mekân kompozisyonu ilişkisi. *Avrupa Bilim ve Teknoloji Dergisi,* (25), 94-104.

Payne, S. R., Potter, R., & Cain, R. (2014). *Linking the Physical Design of Health-Care Environments to Wellbeing Indicators*. https://doi.org/10.1002/9781118539415.WBWELL069

Postell, J. (2012). *Furniture Design*. John Wiley & Sons.

Reiling, J. G., Knutzen, B. L., Wallen, T. K., McCullough, S., Miller, R., & Chernos, S. (2004). Enhancing the traditional hospital design process: A focus on patient safety. *The Joint Commission Journal on Quality and Safety, 30*(3), 115-124.

Relph, E. (1976). *Place and Placelessness* (Vol. 67). Pion.

Salmons, J. (2014). *Qualitative Online Interviews: Strategies, Design, and Skills*. Sage Publications.

Salonen, H., Lahtinen, M., Lappalainen, S., Nevala, N., Knibbs, L. D., Morawska, L., & Reijula, K. (2013). Design approaches for promoting beneficial indoor environments in healthcare facilities: A review. *Intelligent Buildings International, 5*(1), 26-50.

Schweitzer, M., Gilpin, L., & Frampton, S. (2004). Healing spaces: Elements of environmental design that make an impact on health. *Journal of Alternative & Complementary Medicine, 10*(1), 71-83.

Shumaker, S. A., & Reizenstein, J. E. (1982). Environmental factors affecting inpatient stress in acute care hospitals. *Environmental stress*, 179-223.

Shumaker, S. A., Pequegnat, W. (1989). Hospital design, health providers, and the delivery of effective health care. In E. H. Zube & G. T. Moore (Eds.), *Advances in Environment, Behavior, and Design*. Springer.

Soh, O.-Z., Choong, W.-W., & Tan, Y.-T. (2015). Quality of Healing Environment in Healthcare Facilities. *Jurnal Teknologi*, *74*(2), 101–108. https://doi.org/10.11113/JT.V74.4529.

Springer, T. (2007). *Ergonomics for Healthcare Environments*. Knoll, HERO, Inc.

Steptoe, A., & Appels, A. (Eds.). (1989). *Stress, Personal Control, and Health*. Wiley.

Stichler, J. F. (2001). Creating healing environments in critical care units. *Critical Care Nursing Quarterly, 24*(3), 1-20.

Tofle, R. B., Schwarz, B., Yoon, S. Y., Max-Royale, A., & Des, M. E. (2004). *Color in Healthcare Environments-A Research Report.* Coalition for Health Environments Research (CHER).

Tuan, Y. (1977). *Space and Place: The Perspective of Experience*. University of Minnesota Press.

Ulrich, R. S. (1997). Effects of interior design on wellness: Theory and recent scientific research. *Journal of Health Care Interior Design: Proceedings from the Symposium on Health Care Interior Design* (pp. 97-109).

Ulrich, R. S., Zimring, C., Zhu, X., DuBose, J., Seo, H. B., Choi, Y. S., ... & Joseph, A. (2008). A review of the research literature on evidence-based healthcare design. *HERD: Health Environments Research & Design Journal, 1*(3), 61-125.

Varol, A. (2023). Determining and Ordering the Basic Evaluation Criteria in the Furniture Design Process. *ICONARP International Journal Architecture and Planning*. *11*(1), 519–537. https://doi.org/10.15320/iconarp.2023.252.

Vos, L., Groothuis, S., & Van Merode, G. G. (2007). Evaluating hospital design from an operations management perspective. *Health Care Management Science, 10*, 357-364.

Wells, M. M. (2000). Office clutter or meaningful personal displays: The role of office personalization in employee and organizational well-being. *Journal of Environmental Psychology, 20*(3), 239-255.

Xue, D., Ibrahim, A. R. Y., & Azahari, M. H. B. (2024). Research on the Impact of Public Interior Design and Spatial Layout on User Behavior. *Journal of Humanities, Arts and Social Science*, *8*(1), 162–166. https://doi.org/10.26855/jhass.2024.01.027.

Zaman, M. U., & Zaman, R. U. (2022). Importance of Hospital Furniture in Modern Medical Facilities. *International Journal of Health Technology and Innovation*, *1*(02), 50–52. https://doi.org/10.60142/ijhti.v1i02.44.

Zamani, Z., Joy, T., & Abbey, M. (2023). Exploring environmental design attributes impacting staff perceptions of safety in a complex hospital system: Implications for healthcare design. *Journal of Hospital Management and Health Policy, 7*(21).

Resume

Zeynep TUNA ULTAV received her bachelor's and master's degrees in architecture from METU, and her PhD from Gazi University. She is currently Head of the Department of Interior Architecture and Environmental Design at Yaşar University. Her research focuses on interior architecture history and theory, modern architecture in Turkey, furniture design, healthcare interiors, architecture and fiction, and tourism architecture.

Çiğdem ÇETİN completed her bachelor's in interior architecture at Çankaya University, master's at Hacettepe University—with an Erasmus period at Camerino University, Italy—and PhD in landscape architecture at Ege University. An associate professor at Yaşar University, her research focuses on environmental psychology, sensory design, healthcare interiors, and user well-being.

Gülnur BALLICE is a professor at Yaşar University. She holds degrees in architecture from Dokuz Eylül and METU. Her research focuses on urban transformation, creative housing, modern architecture history, design pedagogy, and healthcare interiors. She previously worked in architectural practice and served as department head.

Gizem GÜLER NAKIP has received her bachelor's and master's degrees from Yaşar University, Department of Interior Architecture and Environmental Design, where she also worked as a research assistant between 2019 and 2021. She is currently a

DOI: 10.15320/ICONARP.2025.330

PhD student at the Silesian University of Technology. Her research interests include history and theory of architecture, modern housing, and heritage conservation.

ICONARP – Volume 13, Issue 1 / Published: 30.06.2025