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ORIGINAL PAPER

DESIGNING PSYCHIATRIC ENVIRONMENTS TAILORED TO THE NEEDS OF GERIATRIC PATIENTS: SPATIAL SOLUTIONS IN GERIATRIC-PSYCHIATRIC HOSPITAL WARDS THAT REDUCE STRESS AND DISORIENTATION

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Highlights

- The study examines the impact of architectural design on stress in geriatric patients.
- The study analyzes the role of the therapeutic environment in geriatric psychiatry.
- The study develops design guidelines tailored to the needs of geriatric patients.
- The findings confirm that spatial layout affects orientation in geriatric patients.
- The study proposes architectural solutions to reduce disorientation in geriatric patients.

Abstract

Background: The progressive aging of the population increases the demand for specialized psychiatric wards adapted to the needs of older adults. A particular challenge is designing spaces for patients with dementia, as environmental changes may cause disorientation, deterioration of mental condition, and increased behavioral disturbances. Properly designed therapeutic environments improve safety, support spatial orientation, and enhance psychological comfort. The aim of this study was to identify and analyze good design practices in geriatric psychiatric wards based on the principles of health-promoting architecture. **Material and Methods:** A narrative literature review was conducted, covering publications on healthcare architecture, environmental psychiatry, and therapeutic environment design, with particular focus on patients with dementia. Current guidelines, design recommendations, and practical solutions used in healthcare facilities were also analyzed. The study had a descriptive and comparative character. Identified architectural solutions were assessed using a qualitative comparative approach according to criteria related to health-promoting architecture, including spatial orientation, accessibility, environmental safety, sensory comfort, social interaction, and reduction of stress and behavioral symptoms. **Results:** The analysis showed that clear functional layouts, spatial zoning, and intuitive wayfinding reduce disorientation and improve patient independence. Important elements include appropriate colors, visual identification features, natural lighting, contact with nature, and ergonomic and safe equipment. Communal spaces support social interaction, reduce isolation, and enhance therapeutic processes. These solutions may reduce stress, aggressive behaviors, and improve quality of care. **Conclusions:** Designing geriatric psychiatric wards according to the needs of people with dementia supports treatment effectiveness and user safety. Integration of architectural knowledge with psychiatry and environmental psychology enables the creation of health-promoting environments. The findings may support modernization of existing wards and the design of new facilities, while indicating the need for further research on the impact of therapeutic environments on clinical outcomes and patient well-being in long-term psychiatric care settings for older adults. Med Pr Work Health Saf. 2026;77(4)

Key words: dementia, geriatric psychiatric wards, therapeutic environment design, psychiatric hospital architecture, healthcare architecture, dementia-friendly design

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INTRODUCTION

The issue of an aging population constitutes a significant challenge for healthcare systems worldwide. According to demographic projections published by the Statistics Poland (Główny Urząd Statystyczny – GUS) [1], the proportion of older adults in the Polish population is expected to continue increasing over the coming decades, reaching approx. one-third of the population by 2050. Current data and estimations of future trends indicate that a high proportion of an aging population will lead to an increased incidence of age-related diseases associated not only with physical functioning, but primarily with mental health. Mental disorders in old age are the

fifth leading cause of death and significantly reduce the ability of older adults to function independently [2]. These conditions are often diagnosed at an advanced stage, which is associated with the need for frequent hospitalizations.

The growing number of elderly individuals affected by mental disorders has a direct impact on the increasing number of patients hospitalized in geriatric wards. In certain cases, hospitalization in psychiatric wards is necessary. This applies to situations involving severe or new symptoms, diagnostic difficulties, co-occurring affective disorders, and challenges in selecting appropriate pharmacological treatment.

However, a change of environment, such as hospitalization, may lead to increased disorientation, a sense of confusion, and elevated stress levels in patients with cognitive impairments. Consequently, individuals suffering from senile dementia who are placed in an unfamiliar environment such as a hospital ward may pose a risk of harm to themselves, their caregivers, and other patients [3]. Loss of a sense of security, resulting from dysfunctions in older adults, may intensify stress and thereby increase the likelihood of aggressive episodes in their daily functioning within a hospital setting [2,4].

In this context, the evaluation of the architecture of geriatric wards in psychiatric hospitals in terms of its impact on the overall well-being of elderly patients becomes particularly important.

Previous research indicates that the design of spaces in healthcare facilities has a significant impact on the comfort, safety, and orientation of people with dementia. Among the most important factors are:

- appropriate spatial layout,
- easy access to rooms,
- the use of natural light,
- color selection,
- mobility systems,
- therapeutic gardens,
- appropriate finishing materials.

These elements can influence stress levels, well-being, and patient behavior. At the same time, recommendations for designing a dementia-friendly environment are scattered across various disciplines, such as architecture, medicine, and environmental design. To date, these guidelines have been relatively rarely analyzed in relation to geriatric psychiatric units. Therefore, a comprehensive analysis of these factors is needed, which will allow for the assessment of existing psychiatric facilities and the development of guidelines to support the design of future facilities.

The literature review conducted as part of this study formed the basis for the development of an analysis model encompassing 6 groups of architectural and environmental factors. The developed criteria were then used to conduct a comparative analysis of selected psychiatric hospitals.

The research problem addressed in this paper concerns the impact of architectural and material solutions used in the design of geriatric wards in psychiatric hospitals on the level of mental well-being and safety of patients with dementia syndromes. Accordingly, the research conducted for the purposes of this article attempts to answer the following questions:

- Which elements of hospital architecture contribute to reducing stress in geriatric patients with dementia?
- How do finishing materials and interior furnishings affect the level of safety of patients and staff?
- How can the hospital environment be adapted to the specific needs of people with dementia in order to reduce disorientation and stress resulting from a change of surroundings?

The aim of this study is to analyze and systematize architectural and material solutions used in psychiatric hospitals that have a significant impact on the well-being of geriatric patients with dementia syndromes. The compilation and analysis of the presented solutions may provide a basis for the modernization of existing wards and support the design process of new psychiatric healthcare facilities.

MATERIAL AND METHODS

Research design

The study was conducted in 4 stages. The first stage involved a literature review aimed at identifying architectural and environmental factors influencing the well-being, stress levels, and safety of geriatric patients with dementia residing in psychiatric wards. The next stage involved collecting research materials, including scientific publications, architectural documentation, and data obtained during visits to the analyzed facilities. A comparative analysis of selected psychiatric hospitals was then conducted, using previously identified criteria as the basis for the assessment. The final stage involved the development and interpretation of the obtained results, which allowed for the formulation of recommendations for the design of geriatric psychiatry wards.

Study population

The starting point for the research presented in this article was the identification of the study group, consisting

of geriatric patients with dementia syndromes. In 2023, the population of Poland amounted to 37.6 million, including nearly 9.9 million people aged ≥60 years (26.3% of the total population) [1].

Within the geriatric patient population, dementia syndromes are among the most frequently diagnosed psychiatric disorders. They significantly affect cognitive, emotional, and behavioral functioning, increasing the demand for specialized psychiatric and geriatric care.

According to the World Health Organization (WHO), in 2021 approx. 57 million people worldwide were living with dementia, with nearly 10 million new cases recorded each year [5]. In Poland, it was estimated that in 2024 the number of people with dementia reached approx. 600 000. Projections for 2050 assume that the number of people with dementia worldwide will increase to 152 million, while in Poland the number of patients may rise to 1.4 million [3,4,6]. Dementia, or dementia syndromes, is a medical term used in the context of various brain diseases characterized by the loss of cognitive functions. According to medical classification, dementia-related conditions include:

- Alzheimer's disease,
- vascular dementia,
- dementia with Lewy bodies,
- frontotemporal dementia,
- semantic dementia,
- primary progressive aphasia,
- behavioral variant frontotemporal dementia,
- mixed dementia.

In order to better understand the specific needs of patients affected by dementia, it is necessary to outline the most common behavioral disturbances and psychiatric symptoms associated with these conditions [7,8].

Figure 1a presents the most common behavioral disturbances associated with dementia – the behavioral domain according to the International Psychogeriatric Association (IPA), including shouting, aggression, agitation, and hostility [9]. Figure 1b presents the most common psychiatric symptoms associated with dementia – the psychological domain according to the IPA [9]. These symptoms may occur individually or coexist in various combinations, depending on the type and stage of dementia as well as individual patient characteristics.

The behaviors and symptoms presented in the diagrams reflect the typical profile of a geriatric patient with dementia hospitalized in a psychiatric ward. The growing demand for psychiatric care for older adults with dementia is confirmed by hospitalization data. Figure 2 presents the changes in the number of psychiatric hospitalizations of elderly patients with dementia in Poland 2020–2024. Data used to compile this summary come from the National Health Fund (NFZ).

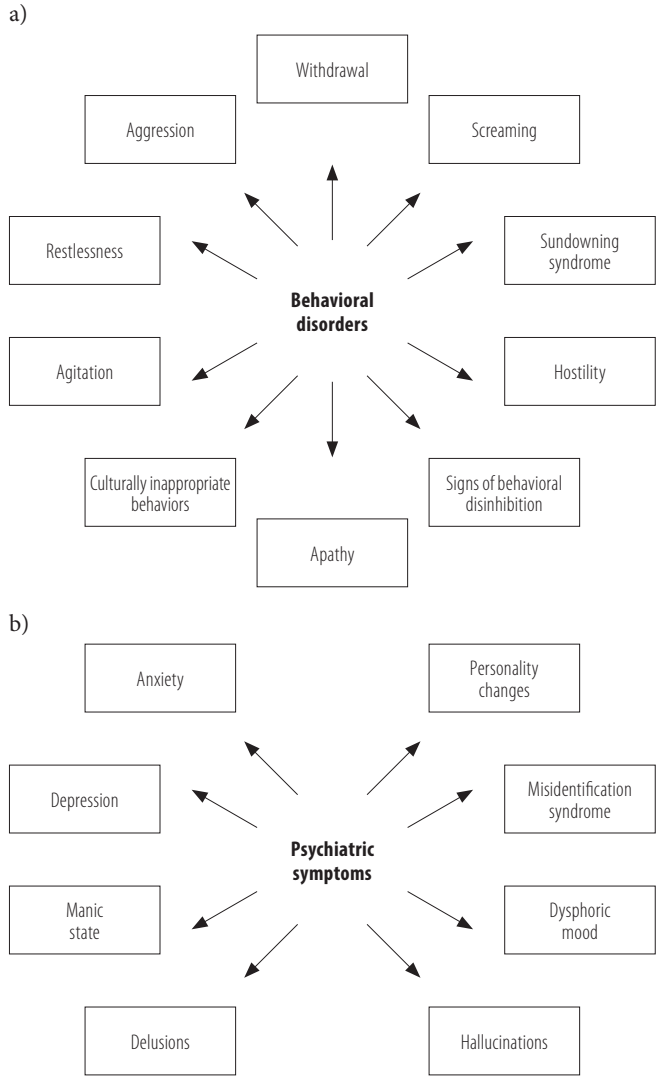
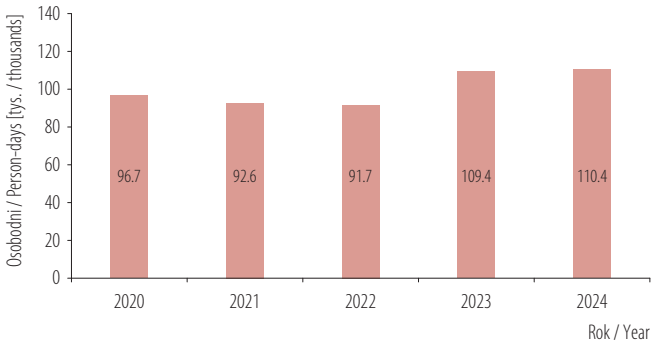


Figure 1. Most common a) behavioral disturbances associated with dementia – behavioral domain according to International Psychogeriatric Association (IPA) and b) psychiatric symptoms associated with dementia – psychological domain according to IPA [9]

The characteristics of the study group were determined based on available epidemiological data and clinical guidelines published by national and international institutions [1–5].

Research materials

The research materials were collected to identify and compare architectural solutions implemented in psychiatric hospitals providing care for geriatric patients with dementia. The materials included literature sources, empirical data, and documentation obtained during study visits.



Source: Authors' own elaboration based on data from the National Health Fund (NFZ) [2].
ICD-10 – International Statistical Classification of Diseases and Related Health Problems, 10th Revision, F02.1 – dementia in other diseases classified elsewhere, with late onset, F02.2 – dementia in Huntington's disease, F02.3 – dementia in Parkinson's disease.

Figure 2. Number of person-days (thousands) of psychiatric inpatient hospitalizations with a principal ICD-10 diagnosis of F00-F01 (including all extensions and unspecified codes) or F02.1-F02.3 among patients aged ≥55 years, 2020–2024

The primary basis consisted of international scientific publications concerning the design of spaces for people with dementia, with particular emphasis on wards in psychiatric hospitals. The analysis of scientific literature was complemented by design guidelines developed in the United Kingdom and the United States, as well as Polish studies on principles of universal design.

The second important type of material included architectural documentation of psychiatric hospital buildings, which was analyzed in terms of functional layouts, hospital planning programs, and spatial solutions for rooms such as patient wards and therapeutic spaces.

To supplement the research material, photographic documentation obtained during study visits was used.

Study visits were conducted in 2025 and repeated in 2026 in selected psychiatric healthcare facilities in Poland. The institutions included in the analysis were:

- Dr Józef Bednarz Provincial Mental Health Hospital in Świecie (Wojewódzki Szpital Zdrowia Psychicznego im. dr. Józefa Bednarza w Świeciu),
- Adult Psychiatry Clinic at the University Clinical Centre in Gdańsk (Klinika Psychiatrii Dorosłych Uniwersyteckiego Centrum Klinicznego w Gdańsku),
- Prof. Tadeusz Bilikiewicz Provincial Psychiatric Hospital in Gdańsk (Wojewódzki Szpital Psychiatryczny im. prof. Tadeusza Bilikiewicza w Gdańsku),
- Stanisław Kryzan Hospital for the Mentally Ill in Starogard Gdański (Szpital dla Nerwowo i Psychicznie Chorych im. Stanisława Kryzana w Starogardzie Gdańskim).

Three of these institutions are monospecialist psychiatric hospitals, whereas the Adult Psychiatry Clinic at the University Clinical Centre in Gdańsk is a psychiatric ward within a multispecialty hospital and was included to provide a comparative perspective.

During the study visits, photographic documentation, observations, and documentation of the urban and spatial context of the hospitals were collected. The empirical material included the location of the facilities, the organization and number of hospital buildings, visual identification and wayfinding systems, and the functional relationships within the hospital complexes. Particular attention was paid to the readability of the spatial layout, patient safety, accessibility and organization of green spaces belonging to psychiatric hospitals, and their potential to support therapeutic activities and patient recreation.

Research methods

The analysis was conducted using a literature review and comparative analysis of selected architectural solutions applied in psychiatric facilities.

The applied research methodology was descriptive and comparative in nature. As part of the comparative analysis, a review of existing architectural and spatial solutions used in selected psychiatric care facilities was conducted. The analysis included, among others, the functional and spatial layout of wards, material solutions, the design of common and therapeutic spaces, as well as elements supporting spatial orientation and patient safety. The aim of the analysis was to identify recurring architectural solutions and evaluate their potential impact on the quality of the therapeutic environment, the improvement of which may contribute to reducing the number of aggressive episodes among geriatric patients.

A literature review identified the most important architectural and environmental factors influencing stress reduction in geriatric psychiatric units. These were then organized into 6 thematic categories (Figure 3) that were used to compare the selected psychiatric facilities.

The results of the analyses and studies were organized according to the main design areas discussed in the literature that significantly affect stress reduction in geriatric patients hospitalized in psychiatric wards. The research findings were organized according to the main design areas described in the literature that influence stress reduction in geriatric psychiatric patients. A comparative analysis was presented based on 6 groups of architectural and spatial factors identified in the literature review. Each group encompasses design solutions that support stress reduction and forms the basis for the presented findings.

RESULTS

A comparative analysis of selected psychiatric facilities identified 6 main areas of architectural and spatial solutions that contribute to stress reduction in geriatric patients with dementia. These areas were identified based on a literature review and analysis of existing psychiatric facilities. They include:

- the functional layout and organization of the ward space,
- the architecture and finishing of common spaces,
- the spatial orientation system and signage,
- patient rooms and sanitary facilities,
- therapeutic spaces,
- green areas and outdoor therapeutic spaces.

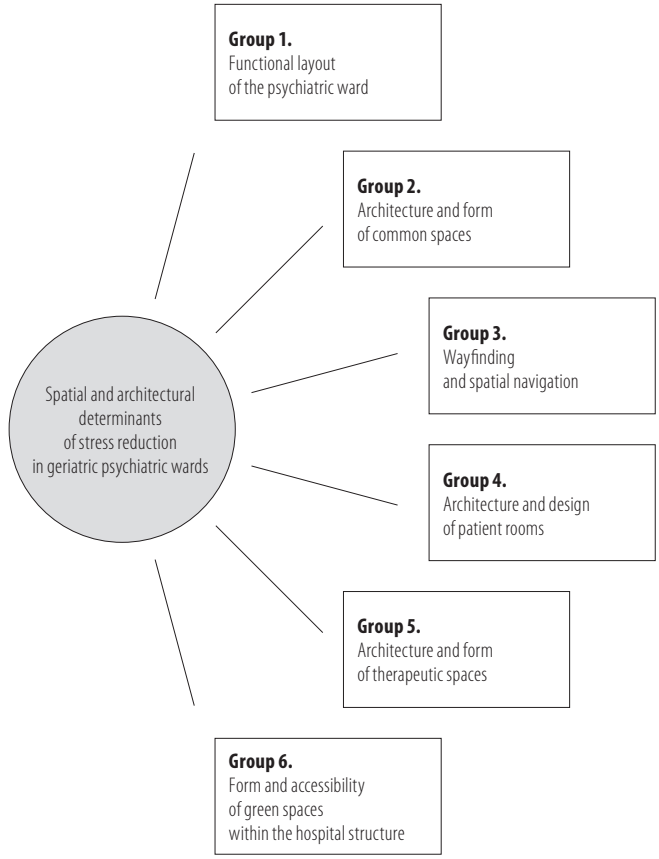
This division illustrates the most important elements of the geriatric psychiatric ward environment – from the organization of the entire ward, through common spaces and patient rooms, to the external environment. The identified areas are presented in Figure 3, which forms the basis for the analysis presented in Tables 1 and 2.

In each area, the solutions were further divided into thematic blocks covering specific architectural aspects related to stress reduction. This allowed for a more detailed presentation and comparison of the analyzed solutions.

The analysis indicates that architectural and spatial aspects related to the functional layout are crucial for reducing stress in geriatric patients. These include the appropriate location of the psychiatric ward within the hospital structure, functional layouts that support spatial orientation for older adults, and proper zoning that enables patients' freedom of movement. The detailed results are presented in Table 1.

A comparative analysis revealed that the second group of architectural solutions that contribute to stress reduction is the design of common spaces. These solutions, aimed at improving patient orientation and increasing their sense of security in geriatric psychiatric wards, were divided into 3 thematic blocks related to the design of walls, floors, and glazing in common spaces such as lobbies, therapy rooms, and dining rooms. The analysis considered the type, color scheme, and application of finishing materials (Table 1).

The analysis also revealed that spatial orientation and signage systems are an important design element, enhancing patient safety and independence. The identified solutions were divided into thematic blocks covering directional signage, visual contrasts, color coding, and landmarks that facilitate navigation within the ward.



Source: Authors' own elaboration based on the literature review [15].

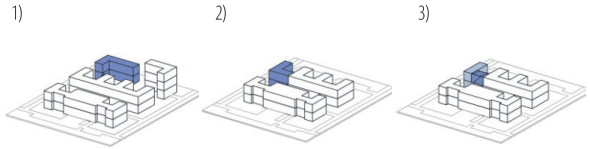
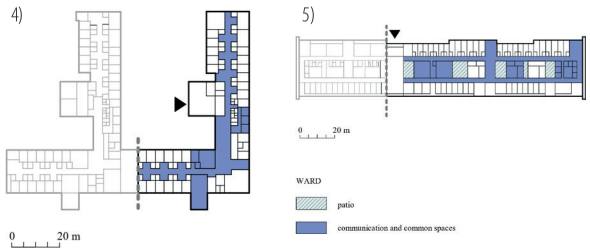
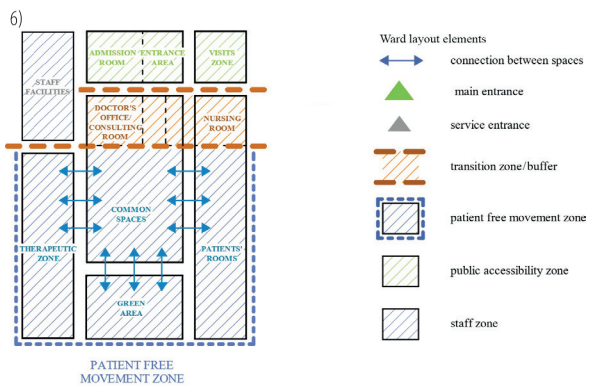
Figure 3. Classification of architectural and spatial elements affecting comfort, orientation, and stress reduction in geriatric psychiatric wards

Key factors include consistent directional signage, appropriate size, form, contrast, and color of signs, as well as the use of reference points such as distinctive graphic elements, colored panels, or rooms with clearly defined functions. An excess of visual stimuli hinders the identification of important information, whereas clear signage and color-coded spatial organization support patient orientation and independence (Table 1).

Another important aspect of the comparative analysis concerns the design of patient rooms and associated sanitary facilities. These spaces play a crucial role in ensuring the safety and comfort of geriatric patients while supporting a stress-reducing environment. Table 1 also presents design principles for patient rooms and their associated sanitary facilities, taking into account functional requirements, safety considerations, and the needs of individuals with cognitive and motor impairments.

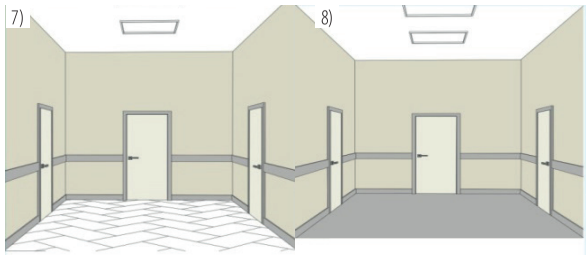
In psychiatric hospitals, spaces dedicated to therapy play an important role in the treatment process. Another design area concerns the form and organization of therapeutic spaces that support treatment effec-

Table 1. Architectural and environmental design recommendations for geriatric psychiatric wards, including ward layout, interior finishes, wayfinding, patient rooms, and therapeutic spaces: a synthesis of findings from the literature review and site visits conducted in selected psychiatric healthcare facilities in Poland in 2025–2026

Issue	Layout/photo	Description
Elements shaping spatial conditions		
functional layout		
variants of the location of the geriatric psychiatric ward within the hospital structure		Geriatric mental health units can be established as: ■ inpatient units located in separate buildings within a psychiatric hospital complex (Layout 1), ■ an inpatient unit separated within the hospital structure as a wing or floor (Layout 2), ■ a group of separate rooms within an acute or general ward (Layout 3). Conclusion: The first 2 spatial solutions offer the opportunity to shape hospital environments that meet the needs of older adults with mental health problems, i.e., geriatric psychiatric units [10,11].
forms of the functional layout of a psychiatric ward		Layouts 4 and 5 present examples of functional layouts of psychiatric wards [10,11,15]: ■ linear (corridor) layout – communication takes place along 1 main corridor, along which offices and therapy rooms are located (Layout 4), ■ central (loop) layout – organization of space based on a loop-shaped arrangement of corridors and common spaces around which the patient rooms and therapeutic rooms are arranged (Layout 5). Conclusion: Variant presented in Layout 5 and its variations are the recommended functional layout for geriatric psychiatric wards [10–13]. In geriatric wards, it is recommended to use closed-loop corridor systems, around which are located the patient rooms, therapy rooms, and the dining room [10–15].
recommended zoning of the geriatric psychiatric ward		A sample zoning layout for a geriatric ward, including accessibility and function zones, includes [11–15]: ■ a public zone encompassing spaces accessible to all, such as: – registration and waiting areas located at the entrance, with direct access to the admissions office with a psychiatric consultation room, – a visiting area; ■ a transition zone encompassing spaces with restricted access for staff only, such as: – doctor's offices with a duty station, – a nurse's station; ■ a patient circulation zone encompassing spaces accessible to patients on the ward, such as: – patient rooms located on the perimeter of the ward, – centrally located common spaces, such as the dining room, recreation area, and activity rooms, – therapeutic areas, – green areas, e.g., in the form of a patio; ■ a staff zone encompassing spaces with restricted access for staff only, such as: – administrative and staff rooms, – staff room, – locker room complex with a sanitary hub. Conclusion: In a geriatric psychiatric ward, a clear division into zones with varying accessibility should be implemented, with a central layout of common areas and patient rooms located on the periphery of the ward. It is advisable to introduce a buffer zone separating the public area from the ward area [11–15]. Layout 6 presents a proposed spatial organization of a geriatric psychiatric ward, with centrally located common spaces, patient rooms positioned along the ward perimeter, and a buffer zone separating public and clinical functions.

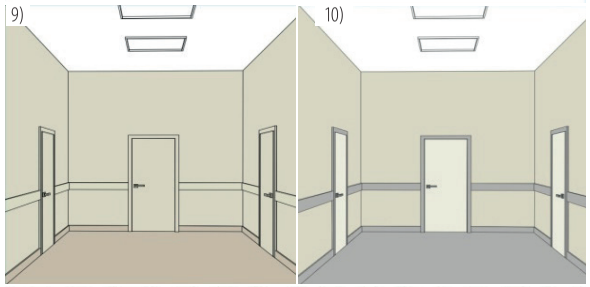
form and finishing

floor finishing



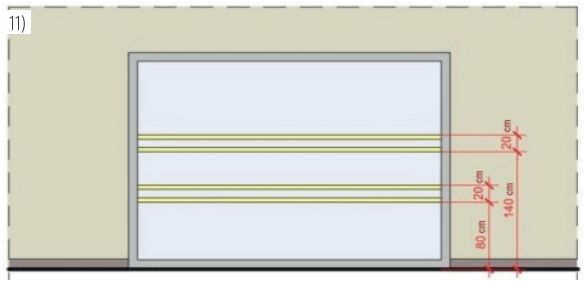
The importance of floor finishes in geriatric psychiatric wards – the way floor surfaces are designed influences patient safety and spatial orientation [11–12,14,17].
Layout 7 – patterned floor: a floor with an intense pattern can impair spatial orientation and balance in older adults with visual perception impairments, increasing the risk of trips and falls.
Layout 8 – solid floor: a floor with a uniform color and a clear contrast to the walls facilitates geriatric patients' orientation, movement within the ward, and safety.
Conclusions:
Appropriate floor finishes are recommended in geriatric psychiatric wards because they support patients' spatial orientation and minimize the risk of falls and perceptual difficulties [11–12,14,17].

wall finishing



The importance of wall finishes and visual contrasts in geriatric psychiatric wards – appropriate wall surface design, contrasting fixtures, and lighting influence patient safety and spatial orientation [11–12,14,17].
Layout 9 – monochromatic space finishes: interiors without clear color contrasts hinder patient orientation and increase the risk of trips and falls.
Layout 10 – contrasting space finishes: walls and fixtures (handles, railings, furniture, door frames, corridor plinths) highlighted by contrast facilitate orientation, movement, and increase patient safety.
Conclusions:
The use of contrasting interior finishes in geriatric psychiatric wards is recommended – handles, railings, furniture, contrasting door frames, handrails along the walls, and corridor plinths support patient independence, facilitate spatial orientation, and minimize the risk of falls [11–12,14,17].

glass wall and door markings

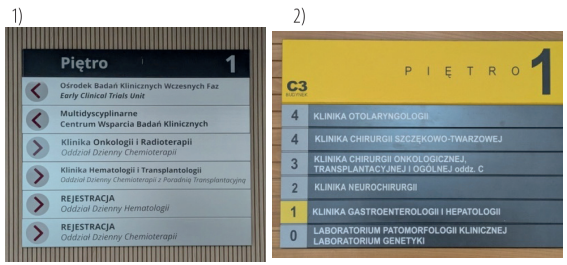


The Layout 11 shows the glazing markings based on universal design. Glass elements such as walls, doors, and partitions should be marked with horizontal color bands at heights of 80–100 cm and 140–160 cm [17].
Conclusion:
In a geriatric psychiatric ward, glass elements such as walls, doors, and partitions should be marked with horizontal color bands. This solution supports patient orientation and increases their safety [17].

Factors

informational signage and spatial orientation

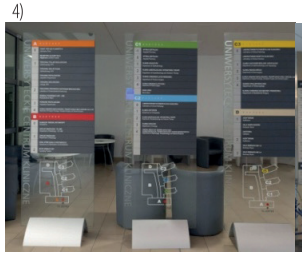
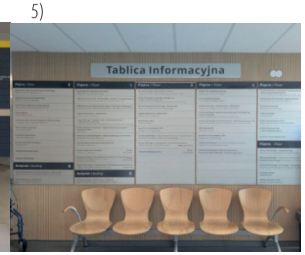
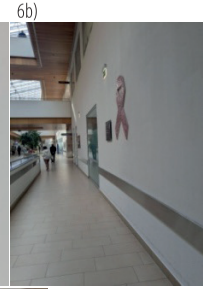
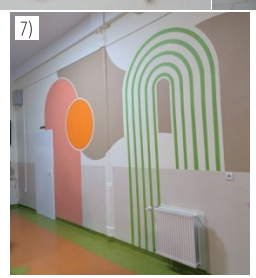
contrast and size of markings



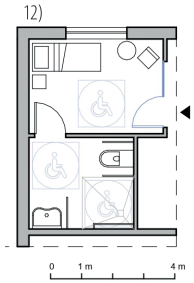
The effectiveness of signage depends on graphic legibility. In geriatric wards, where users include people with cognitive impairments, visual impairments, and low vision, the following are recommended:
- large, clearly visible signs [18,20],
- simple sans-serif typefaces [18,20],
- high contrast between the background and the symbol [14,19].

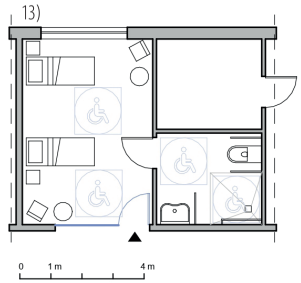
Photos 1 and 2 show examples of information boards placed in the general circulation area of the University Clinical Center in Gdańsk.
In Photo 1, the information on the board is presented using simple symbols and a black and white color scheme. The board shown in Photo 2 uses color contrast as the main determinant of functional identification (identification color), which improves the user's cognitive processes.
Conclusion:
Well-designed signage that addresses the needs of older adults, particularly those with visual and cognitive impairments, plays an important role in supporting spatial orientation and independent navigation within hospital environments.

Table 1. Architectural and environmental design recommendations for geriatric psychiatric wards, including ward layout, interior finishes, wayfinding, patient rooms, and therapeutic spaces: a synthesis of findings from the literature review and site visits conducted in selected psychiatric healthcare facilities in Poland in 2025–2026 – cont.

Issue	Layout/photo	Description
Factors – cont.		
informational signage and spatial orientation – cont.		
simple form and clear markings	3)  	Signage used in geriatric psychiatric wards should be designed in a simplified and clear manner [18–20,23]. It is recommended that geriatric psychiatric wards use signage that: ■ is based on clear pictograms and a logical hierarchy of information [18–19], ■ is free from information overload [19–20,23]. Photo 3 shows the signage at the entrance to the University Clinical Center in Gdańsk, using clear text and pictograms. Conclusion: Clear and simplified signage, based on intuitive pictograms and a logical hierarchy of information, is essential for reducing cognitive overload and facilitating spatial orientation and independent navigation among older patients in geriatric psychiatric wards.
color	4)  5)  	Color is an important tool for supporting spatial orientation. It is recommended to use the following in geriatric psychiatric wards: ■ distinctive colors (especially warm ones, which are easier to recognize by people with dementia) [14,18–19], ■ color-coding spatial functions, which facilitates memorizing the ward's layout and reduces disorientation [20–21,23]. Photo 4 shows the hospital's division into departments using color coding and contrast at the University Clinical Center in Gdańsk. Photo 5 shows information boards at the University Clinical Center in Gdańsk, which show the hospital's division into departments based on color contrast.
reference points	6a)  6b)  7) 	Patient orientation is supported by clear and distinctive visual and functional elements placed at key points throughout the ward [14,21]. It is recommended to place graphics, photo wallpapers, color panels, rooms with a clear function, and distinctive furnishings in strategic locations – at corridor intersections, entrances to areas, and along main circulation routes. Such markings allow patients to intuitively recognize their location and navigate the ward space [14,21]. Photo 6a–b shows a sculpture located in the circulation area of the University Clinical Center, a distinctive feature of the hospital structure. Photo 7 shows a mural created by students of the Faculty of Architecture at the Bydgoszcz University of Technology in the adult psychiatric ward of the Dr Józef Bednarz Provincial Mental Health Hospital in Świecie. Conclusion: The use of distinctive color coding and recognizable visual landmarks at strategic locations supports spatial orientation, facilitates wayfinding, and reduces disorientation among older patients, particularly those with cognitive impairments, in geriatric psychiatric wards.

architecture of patient rooms





The functional layouts of a single-person (Layout 12) and a two-person (Layout 13) room with a sanitary facility for patients of the geriatric psychiatric ward.

functional layout

It is recommended that patient rooms in the geriatric ward:
- be single, or maximum two-person rooms [11,12,15],
- enable staff to observe the patient through safe glazing [15],
- have adequate maneuvering space for wheelchair users [12],
- have integrated hygiene and sanitary facilities adapted to the needs of people with mobility disabilities [12,14].

lighting

It is recommended that patient rooms in the geriatric ward be:
- it primarily by sunlight [12,13],
- equipped with roller blinds or medical shutters to regulate the amount of daylight entering the room and limit excessive sunlight and glare [12,14],
- equipped with artificial lighting with a neutral light color [12,15],
- equipped with navigation lighting to facilitate spatial orientation at night [12],
- equipped with mechanical light switches to avoid sudden changes in light intensity generated by photoelectric cells, which can cause disorientation or anxiety in patients with dementia and visual impairments [12].

colors and contrast

It is recommended that the colours of the rooms for patients in the geriatric ward be contrasting, especially between the walls and the floor, in order to reduce the risk of falls and impacts [14].

equipment and finishing

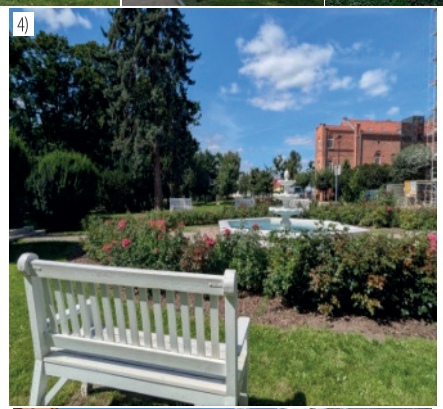
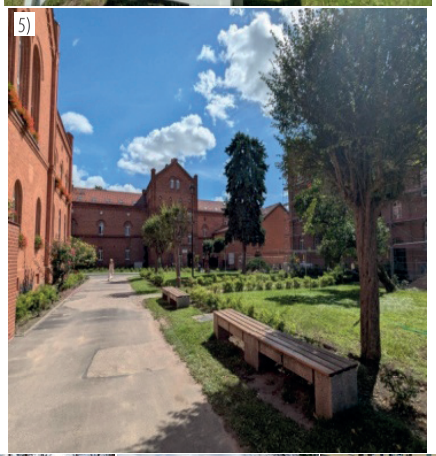
It is recommended that the furnishings in the patient rooms of the geriatric ward be:
- contrasting with the colors of the walls and floors of the room [12,17],
- permanently attached to the walls or floors to ensure the safety of patients and staff, especially in the event of aggressive behaviour [11–13,15],
- resistant to disinfectants [12],
- free of sharp edges or elements that could constitute an attachment point [12],
- equipped with drawers that prevent full opening [12],
- free of mirrors [12].

The furnishings and finishing of the hygiene and sanitary areas of the patient rooms of the geriatric ward are recommended to be:
- made of non-slip materials (e.g., flooring) [12,14],
- in contrasting colors, enabling independent use by visually impaired patients [14],
- dedicated to people with mobility impairments, and equipped with handles to support people with limited mobility [12,14].

Form and organization of therapeutic spaces	
room of memories – furnishings	It is recommended that memory rooms: ■ be equipped with furniture, everyday objects, and photographs from the patient's past [26,27], ■ have décor and furnishings that evoke positive emotions and memories from the patient's past [28], ■ be equipped with safe, stable items, and adapted to patient mobility limitations [25]. In the memory room space, it is not recommended to: ■ amuse furnishings or decorations that could trigger negative emotions, stress, or disorientation for the patient, ■ use patterned or heavily textured wall materials.
therapeutic kitchen – furnishings and finishing	It is recommended that therapeutic kitchens be: ■ designed in accordance with universal design principles, taking into account safety and ergonomics [22,27], ■ equipped with furniture adapted to the needs of people with limited mobility, including wheelchair users [22,27], ■ equipped with furniture that limits bending and reaching at heights [22,27], ■ equipped with furniture equipped with ergonomic handles and self-closing mechanisms, avoiding tip-on systems/equipped with open cabinets or cabinets marked graphically/color-coded/coded for easy identification of contents [22,27], ■ equipped with contrasting furniture, e.g., countertops contrasting with the cabinet fronts and the wall above the countertop for better spatial orientation [22,27], ■ equipped with safe household appliances: induction cooktops instead of gas cooktops, kettles with automatic shut-off [22,27], ■ equipped with a locked cabinet for hazardous equipment, issued by staff [22,27]. When designing therapeutic kitchens, it is recommended to avoid: ■ locating electrical outlets and light switches in areas easily accessible for patient manipulation, ■ using breakable utensils and accessories with sharp edges.
sensory rooms – furnishings and finishing	It is recommended that sensory rooms: ■ be designed in accordance with the principles of multi-sensory stimulation (sight, hearing, touch, smell) [25,26], ■ have no access to daylight or have the option of completely limiting it [25–29], ■ be equipped with adjustable lighting (e.g., light columns, curtains, light hoses) [25], ■ finishes that improve acoustics (e.g., curtains, canvases, soft panels) [27,28], ■ ensure a high level of safety thanks to soft materials (e.g., mattresses, pillows) [25–29], ■ include visual stimulation equipment (e.g., multimedia projectors) [25–27], ■ have enable auditory stimulation through appropriate sound systems [28], ■ be equipped with specialized therapeutic furniture (e.g., swings, pouffes, waterbeds) [25,27], ■ enable the stimuli to be tailored to the patient's individual needs [25–29].

Photos, layouts: Daria Pawlaczyk-Szymańska

Table 2. Types of green spaces supporting stress reduction in geriatric psychiatric wards and examples from selected psychiatric hospitals in Poland, 2022–2025

Green spaces	Photo	Description
Park		Hospital parks improve access to green spaces, allow for walks and relaxation, and help reduce stress in geriatric patients. Small architectural elements, sculptures, and benches further enhance the space and support patient comfort [14–15,30,31]. Examples of park spaces in psychiatric hospitals: ■ Stanisław Kryzan Hospital for the Mentally Ill in Starogard Gdański (Photo 1), ■ Dr Józef Bednarz Provincial Mental Health Hospital in Świecie (Photos 2 and 3).
Square		Small-scale squares, located near the ward buildings, facilitate walks and relaxation for geriatric patients, including those with mobility limitations. Benches, fountains, and artistic elements give the space a spa-like character and enhance user comfort [15,31]. Example of a square in psychiatric hospitals: Dr Józef Bednarz Provincial Mental Health Hospital in Świecie (Photo 4).
Green courtyard/patio		A green courtyard (patio), commonly used in geriatric wards, provides patients with safe access without the need for caregiver assistance and functions as an integral part of the shared spaces, promoting relaxation and contact with greenery. This space may be complemented by therapeutic gardens, designed to provide sensory stimulation, calmness, and support therapy through contact with nature. Such solutions contribute to stress reduction, improved well-being, better spatial orientation, and greater patient engagement in occupational therapy and rehabilitation [13,15,30,31]. Example of a green courtyard in a psychiatric ward: green courtyard between buildings in Dr Józef Bednarz Provincial Mental Health Hospital in Świecie (Photo 5).
Areas designated for physical activity		Outdoor areas designed for physical activity, such as sports fields and exercise areas, are increasingly being located within hospital facilities. They promote the movement of geriatric patients, improve physical fitness, and support stress reduction [15,30,31]. Example of hospital spaces designed for physical activity: outdoor gym with patient integration area (Photo 6), sports field (Photo 7), and outdoor gym (Photo8) at the Prof. Tadeusz Bilikiewicz Provincial Psychiatric Hospital in Gdańsk.

Photos: Daria Pawlaczyk-Szymańska

tiveness and stress reduction among geriatric patients. Table 1 also presents solutions related to the design of 3 types of therapeutic rooms: reminiscence rooms, therapeutic kitchens, and Snoezelen sensory rooms, which are specially designed environments providing controlled multisensory stimulation through light, sound, touch, and other sensory elements to promote relaxation and emotional regulation. The results discussed in the table address the functionality, equipment, and safety aspects of these spaces, adapted to the needs of individuals with cognitive and motor limitations.

A key element supporting the treatment of geriatric psychiatric patients is the availability of green spaces. These include parks, squares, green courtyards, and outdoor physical activity zones. Spending time in these spaces improves well-being, promotes activity and social contact, and reduces stress levels. A particularly important role is played by outdoor therapies, including horticultural therapy, which uses hospital gardens to stimulate social and physical activity in people with dementia. Table 2 presents a summary of solutions related to the design and accessibility of green areas for patients in geriatric wards.

DISCUSSION

The collected architectural solutions can be divided into several key design areas that support patient-centered care in geriatric psychiatry units.

The study shows that the design of the building and interiors of geriatric psychiatry units has a significant impact on patient safety, their ability to navigate the space, and the treatment of people with dementia and other cognitive impairments.

A comparison of various solutions indicates that a single architectural element is not sufficient to create an appropriate environment for people with dementia. The best results are achieved by combining multiple solutions, such as a functional room layout, well-organized spaces, carefully selected materials, clear signage to facilitate orientation, therapeutic spaces, and access to green spaces.

The results confirm that architecture should be designed as a holistic approach that takes into account the needs of patients, supporting both the treatment process and the daily lives of older people residing in psychiatric units.

The analysis of spatial solutions in psychiatric wards discussed in the literature indicates that appropriate planning of functional layouts and building location is crucial for reducing patient stress. Locating wards on the ground floor and in direct proximity to green areas and parks enables safe access to outdoor spaces, supporting physical activity and contact with nature, which positively affects mental well-being [10,11]. Closed-loop corridor layouts with centrally located staff rooms increase the sense of safety and facilitate spatial orientation, minimizing stressors associated with disorientation, such as so-called dead-end corridors. The introduction of well-considered functional zoning is also essential in the design process. Admission areas with reception and waiting rooms should be located at the entrance, with access to psychiatric consultation rooms. Patient rooms should preferably be located on the periphery of the unit, separated from shared dining and recreational spaces, which should be centrally positioned. Staff workstations should ensure visibility of all patient areas. Staff facilities, including changing rooms and sanitary units, should be placed in secure zones separated from patient spaces. A well-designed zoning system and functional layout represent not only good architectural practice but, above all, contribute to stress reduction and improved well-being of geriatric patients in psychiatric hospitals [10–15].

However, even a well-designed functional layout may not guarantee user safety if the space is not properly finished. A key factor is the contrast between floor and wall finishes – clear differentiation helps patients with visual and spatial orientation impairments move safely and reduces the risk of falls or collisions [11,12,14,16].

Flooring should be slip-resistant, resistant to disinfectants, and visually neutral, as overly patterned surfaces may exacerbate perceptual difficulties in people with dementia. Equally important is the appropriate color composition of other elements, such as handrails, grab bars, and furniture, to ensure a visually legible and safe environment [11,12]. Independent navigation is also supported by contrasting door frames, handrails along walls, and contrasting corridor skirting boards [17].

Lighting is another critical factor – fixtures should be evenly distributed to provide uniform illumination and eliminate glare. Continuous LED light strips can further enhance contrast, facilitating movement for visually impaired individuals and supporting independence within the hospital environment [12].

Glazed walls, doors, and partitions should be clearly marked with contrasting elements. The application of these design principles increases patient independence, reduces stress related to disorientation, and enhances the sense of safety [17].

Geriatric patients often experience difficulties in visual perception, memory, and cognitive abilities, which can significantly hinder spatial orientation and increase stress levels [6]. Poorly designed spaces lacking clear visual cues may lead to disorientation, prolong hospital stays, and reduce patient comfort. The implementation of a well-designed visual identification system, including coherent wayfinding, is therefore a key element in stress reduction within healthcare environments. The use of clear colors and landmarks to guide patients through space has been shown to significantly improve their sense of safety and ability to navigate independently [17–22]. Similar findings were reported by Passini [23].

The effectiveness of signage depends not only on content but also on size, form, and graphic contrast. Signs that are too small or overly detailed are difficult to read for individuals with impaired vision. Research by Scialfa [24] has shown that older adults understood, on average, only 25% of standard wayfinding signs and symbols used in public buildings. Therefore, hospital signage should incorporate simple pictograms, large sans-serif fonts, and high contrast between background and symbols [18–21].

Color is one of the most effective tools supporting spatial orientation (wayfinding). Studies indicate that color discrimination in people with dementia is impaired, particularly for blue and green hues, whereas warm colors such as yellow and red are more easily recognized [14–17,21].

Distinctive color coding can improve short-term memory and cognitive functioning [8]. In practice, this means that the use of vivid colors in identifying elements – such as doors, wall panels, or zoning systems – can support spatial memory and reduce stress related to disorientation.

An important element supporting spatial orientation in patients with dementia is the use of landmarks. These may take the form of distinctive graphics, colored panels, or artistic elements placed at key points such as corridor intersections, room entrances, or near elevators. Spatial landmarks can also be functionally defined spaces, such as kitchens, common rooms, or nurse stations. Their defining feature is their distinctiveness in form, function, and meaning, enabling intuitive recognition and navigation [14,17–22].

The analyses indicate that visual identification systems in hospital environments are among the key factors influencing stress reduction and improved orientation, particularly for elderly patients with cognitive impairments.

Another important group of design solutions concerns patient safety, accessibility, and patient room design. Patient safety and comfort are fundamental factors influencing stress reduction during hospitalization in psychiatric wards. The ability to move freely within patient rooms and use sanitary facilities, such as bathrooms, significantly affects patients' sense of security and overall well-being. This is particularly important for individuals with dementia, who often experience visual, auditory, and balance impairments [11,12].

Designing patient rooms therefore requires careful attention to every element, in accordance with guidelines and best practices. Rooms should be single- or double-occupancy, with staff visibility ensured through appropriately marked glazing. Lighting should combine access to natural daylight with adjustable artificial lighting; night navigation lighting helps reduce disorientation. Interior color schemes should provide contrast, and furnishings should be fixed, free of sharp edges, and easy to clean [11–15]. Ward design should consider patient needs and not rely on a uniform appearance for all rooms. The ability to accommodate personal items and create a more personalized space helps dementia patients better navigate their surroundings, reduces stress, and improves their well-being.

Another recommendation concerns the creation of dedicated therapy spaces that support patients' memory, emotions, and daily functioning.

The design of patient rooms for geriatric patients involves multiple aspects – from spatial layout, lighting, and color schemes to equipment and sanitary safety – requiring a high level of sensitivity and attention from designers to create environments that support comfort, orientation, and stress reduction [11–15].

There are many forms of therapy supporting people with dementia, such as reminiscence therapy, occupational therapy, and sensory activities. To increase therapeutic effectiveness in psychiatric hospitals, it is recommended to create specialized therapeutic spaces [25]. Examples include reminiscence rooms, sensory rooms, and therapeutic kitchens. The design of such spaces plays a key role in reducing stress and supporting patient functioning. Reminiscence rooms allow patients to reconnect with positive past experiences, stimulating cognitive and emotional processes [26–29]. Sensory rooms support sensory integration, improve motor coordination, enhance independence in daily activities, and reduce aggressive behaviors [26–30]. Therapeutic kitchens enable patients to practice daily living skills, fostering independence and a sense of control [25,28]. Designing these specialized environments requires interdisciplinary collaboration between architects and therapists and must

consider safety, ergonomics, visual contrast, and appropriate equipment layout to minimize injury risk and reduce stress.

The final group of design solutions concerns green environments and access to nature within psychiatric hospitals. Numerous studies highlight the beneficial impact of green spaces on mental health across different social groups. Some focus specifically on the therapeutic role of greenery in psychiatric hospital settings. Green areas of various forms – ranging from historical park layouts to modern squares, patios, and green courtyards – play a crucial role in such environments [13–16,30,31].

Elderly individuals with dementia can improve their mental balance and physical well-being through contact with nature and outdoor activities. Some historical park layouts resemble spa environments, further supporting therapy and relaxation. An example is the Dr Józef Bednarz Provincial Mental Health Hospital in Świecie, which offers extensive green areas including parks, squares, sports fields, and outdoor recreational spaces [13–16,30,31].

Outdoor therapeutic activities, including the increasingly popular horticultural therapy, use hospital gardens to stimulate social and physical engagement among patients with dementia [15,30,31].

Hospital gardens and orchards support social interaction, physical activity, and a sense of agency among patients, directly contributing to reduced stress and improved overall well-being [15,30,31].

The analysis of 6 groups of architectural solutions applied in geriatric wards demonstrated that improving the quality of the therapeutic environment plays a significant role in non-pharmacological support of treatment for patients with dementia. Reducing environmental stressors may decrease the frequency of aggressive episodes and other behavioral symptoms, such as apathy and social withdrawal, while improving safety, quality of care, and working conditions for medical staff.

The presented findings indicate their potential application both in further scientific research and in design practice, including the modernization of existing wards and the development of new psychiatric healthcare facilities.

The presented design recommendations can be helpful to architects, medical facility designers, and hospital managers when modernizing existing psychiatric wards and designing new facilities for older adults with mental health conditions. Their implementation can improve patient safety, reduce the impact of stressful environmental elements, create better working conditions for staff, and enhance the quality of the healthcare environment. The results of this study can also form the basis for developing future research-based guidelines for the design of psychiatric wards for older adults with dementia.

CONCLUSIONS

The progressive aging of society and the increasing number of older individuals with mental disorders, particularly dementia syndromes, constitute a significant challenge for contemporary healthcare systems. Hospitalization in psychiatric wards is associated with elevated stress levels in geriatric patients, resulting from environmental change, disorientation, and a reduced sense of security, which may lead to difficult behaviors, including episodes of aggression.

The research conducted and the results presented in this article demonstrate that the architectural form of psychiatric ward environments can play a significant role in reducing stress among geriatric patients and supporting the stabilization of their emotional state. A clear functional layout, appropriately designed patient rooms, safe common areas, as well as effective visual identification systems, access to natural daylight, and contact with green spaces may contribute to improving patient well-being and serve as an important element of non-pharmacological support in treatment.

Based on the study results, key recommendations for the design of geriatric psychiatry units were formulated. These include:

- a clear and functional layout that facilitates orientation,
- the use of safe, contrasting, and non-slip finishing materials,
- the implementation of a simple marking system based on colors and distinctive landmarks,
- designing patient rooms and therapeutic spaces tailored to the needs of people with dementia,
- providing access to green spaces that promote physical activity, relaxation, and social interaction.

The combined use of these solutions can reduce environmental stress, increase patient safety and comfort, and improve the effectiveness of psychiatric care.

Incorporating the architectural solutions presented in this article – tailored to the needs of geriatric patients – into the design and modernization of psychiatric wards may contribute to improving the quality of care, increasing patient safety, and enhancing the working conditions of medical staff.

The findings presented in this study provide a basis for further interdisciplinary research combining archi-

tecture, psychiatry, and geriatrics. Future studies should evaluate the effectiveness of individual architectural solutions using post-occupancy assessments and investigate their long-term impact on patient well-being, ward safety, and healthcare staff performance.

AUTHOR CONTRIBUTIONS

Research concept: Daria Pawlaczyk-Szymańska, Agnieszka Gębczyńska-Janowicz
Research methodology: Daria Pawlaczyk-Szymańska
Collecting material: Daria Pawlaczyk-Szymańska
Statistical analysis: Daria Pawlaczyk-Szymańska
Interpretation of results: Daria Pawlaczyk-Szymańska, Agnieszka Gębczyńska-Janowicz
References: Daria Pawlaczyk-Szymańska, Agnieszka Gębczyńska-Janowicz

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