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ORIGINAL PAPER

UNIVERSAL DESIGN AND THE QUALITY OF RESIDENTIAL ARCHITECTURE FOR PEOPLE WITH LIMITED MOBILITY: CASE STUDY

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Highlights

- Universal design should be mandatory law.
- Legislation regarding people with disabilities needs to be strengthened.
- Universal design improves the quality of architecture.
- The number of apartments for people with mobility impairments is insufficient.

Abstract

Background: Housing conditions of elderly people in Poland, along with the increasing economic stratification of society, are quite diverse. Statistics show that senior citizens mostly live in dwellings built before the political and economic transformations of the 1990s. Many buildings from that period do not meet current construction law requirements. An analysis of the current developer market indicates that contemporary residential developments also insufficiently address the real needs of people with disabilities. Despite changing legal regulations and growing social awareness, individuals with various health limitations that increase with age still face numerous barriers in everyday life, including architectural ones. **Material and Methods:** The article presents the results of research involving a literature review, housing inventory, application of analytical and comparative methods, interpretation of collected data, and their synthesis. The study identifies typical cases of inadequate – by contemporary standards – architectural solutions in existing multi-family residential buildings, in the context of current legal regulations and principles of universal design. The article includes case studies of apartments from different time periods, with particular emphasis on newer developments. **Results:** The presented examples demonstrate that residential buildings are still not sufficiently adapted to the needs of people with disabilities, including the elderly. Selected current building regulations are discussed, along with housing projects implemented based on these regulations that nevertheless fail to meet users' needs. Based on the conducted research and the authors' design experience, solutions are proposed that could improve housing quality in relation to the needs of diverse users. **Conclusions:** There is a need to further specify regulations regarding the adaptation of buildings to the needs of elderly people and others with disabilities. At the same time, the growing population of seniors should become an attractive target group for developers constructing housing in accordance with market principles. Med Pr Work Health Saf. 2026;77(4)

Key words: elderly people, people with disabilities, accessibility, universal design, residential architecture, ergonomics of the apartment

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INTRODUCTION

The observed increase in the senior population, according to data from Statistics Poland (Główny Urząd Statystyczny – GUS), is a global phenomenon [1]. The demographic situation in Poland does not differ in this respect from other industrialized countries. By the end of 2024, the population aged >70 years in Poland amounted to 5.2 million people, representing 13.9% of the total population [1]. This is a significant number, especially in light of the clear upward trend. Twenty years earlier (in 2004), this group consisted of 3.5 million people (Figure 1).

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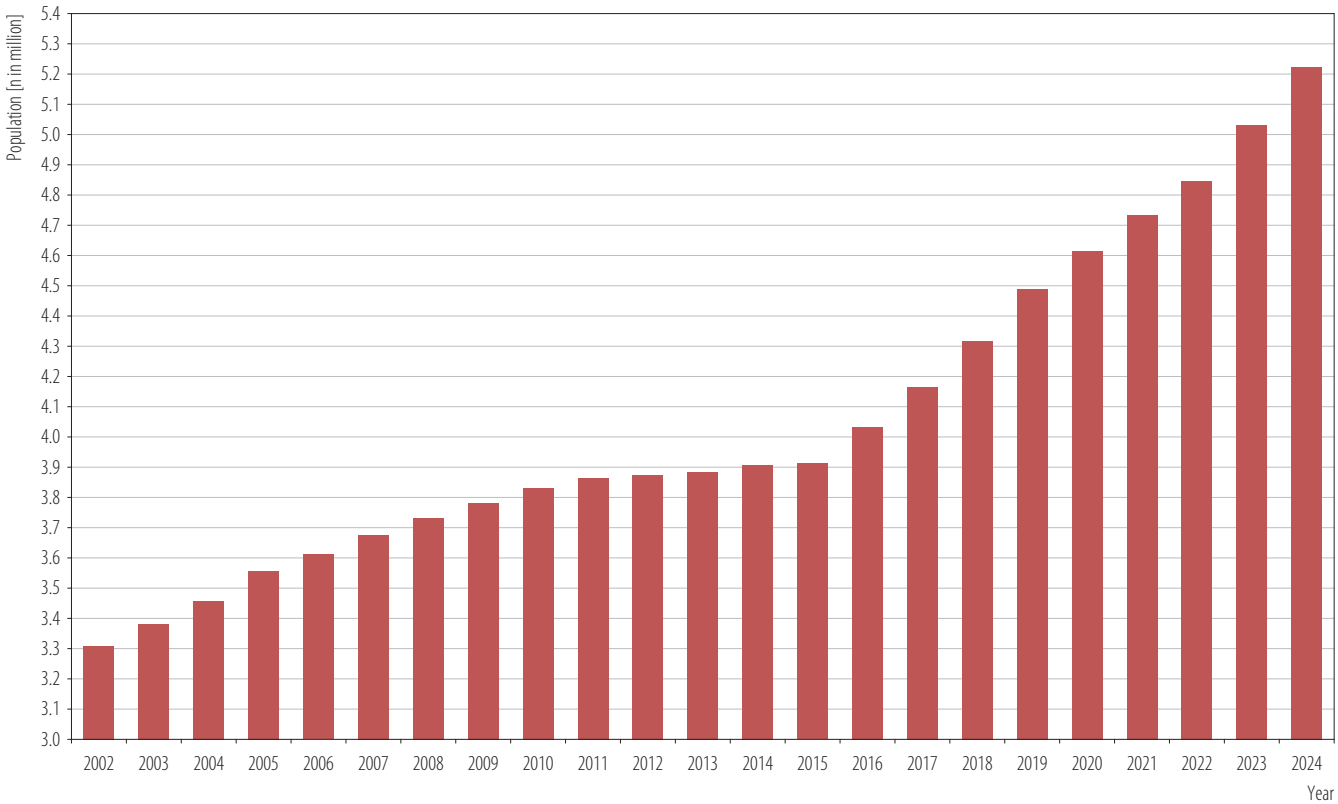


Figure 1. Population in Poland aged >70 years in 2002–2024 according to Statistics Poland [1]

With the systemic transformation in Poland at the end of the 1990s, the construction sector underwent significant changes, particularly the commercialization of the housing market. Statistical data indicate that elderly people mostly live in buildings from the socialist era, which often do not meet current construction law requirements, especially in terms of accessibility for people with disabilities. These issues include site development, building entrances, ramps, lack of elevators or difficult access to them, overly narrow staircases, corridors, doors, and passages that hinder wheelchair movement, as well as small bathrooms, toilets, kitchens, and inadequate technical equipment of apartments.

At the same time, demographic data show that the number of people aged >70 years is steadily increasing. Therefore, adapting post-war residential buildings to the needs of people with various disabilities is becoming a social challenge for the housing sector.

It might be expected that after 1989, with the new socio-economic order in Poland, there would be a qualitative shift in the implementation of new housing developments. Indeed, much has changed. With the increased availability of materials and improved construction standards, real estate prices have risen. Owning an apartment has become a luxury good, usually financed through long-term bank loans, mainly aimed at younger people.

Market research and direct interviews conducted by the authors in real estate sales offices indicate that seniors are still not considered an attractive target group for developers. This results not only in a lack of systemic economic programs but also often in a lack of satisfactory solutions facilitating daily life for people with disabilities. Designers and contractors usually limit themselves to meeting the minimum legal requirements. Construction law in Poland remains imperfect, and introduced changes do not always contribute to improving ergonomics and architectural quality. An example may be the deletion of the provisions of a significant part of §94 in one of the most important legal acts applicable to architectural design, i.e., the regulation of the Minister of Infrastructure on the technical conditions to be met by buildings and their location [2], specifying the minimum widths and areas of rooms in apartments.

The comparison of research results and demographic forecasts reveals a concerning relationship between the noticeable problems faced by elderly people living in inadequately adapted apartments and the relatively small number of implemented universal solutions.

Architectural barriers encountered by elderly and disabled individuals often hinder daily functioning, while making caregiving more difficult. Based on the authors' design experience and literature studies supported by case analyses, several proposals are presented to eliminate deficiencies in existing apartments. The research results can be used in planning ergonomic improvements aimed at enhancing the quality of life of seniors and people with disabilities in both existing and newly designed residential buildings.

MATERIAL AND METHODS

The article presents research results conducted in accordance with methodologies used in the field of architecture [3]. Several contemporary apartments were analyzed in the context of the specific needs of people with mobility impairments, including the elderly. An attempt was made to assess their functional and usability quality. The research focused on multi-family housing, particularly newly designed buildings included in the current offer (year 2025) of developers operating in the Podlaskie Voivodeship, Poland. The study concentrated on comparative analysis of selected spatial and functional elements as well as interior equipment relevant for wheelchair users and individuals with reduced mobility (using canes, crutches, walkers, etc.).

Most of the negative solutions described – despite complying with current building regulations – cause significant functional inconvenience and reduce the quality of life of users with special needs. It was emphasized that the specific requirements of elderly people should be addressed through systemic changes, especially in response to unfavorable demographic trends observed in Poland and across Europe.

The research results were analyzed and assessed, leading to general conclusions. Specific recommendations were also made to improve the quality of existing and planned apartments.

The aim of the study is to draw greater attention among participants in the investment process to the needs of people with mobility impairments and elderly individuals by promoting broader implementation of universal design principles – design that considers the needs of all people regardless of their physical or psychological condition [4].

Professional experience, market analysis, and literature review suggest that architects' ability to create appropriate solutions is often limited by economic constraints imposed by developers and insufficiently defined legislative requirements [2,5].

Research subject

According to the 2021 National Census by GUS, 18.5 million Poles live in multi-family buildings [6]. The research area was limited to the multi-family apartments currently offered on the market in the city of Białystok, which, according to the available information, were adapted to the applicable regulations related to accessibility for people with disabilities at the design stage. The current Construction Law in Poland requires the provision of a minimum share of residential premises accessible to disabled people, but does not specify a specific number [5]. The planned amendment to the regulations proposes setting the minimum number at 6%. This is not welcomed by the development community, which prefers the current regulations that do not contain rigid indicators. As a result, residential buildings rarely include >1 apartment dedicated to people with disabilities. Moreover, purchasing such a unit does not require proof of disability – anyone can buy it. Currently, the number of accessible apartments is insufficient relative to real needs.

In today's market economy, it is assumed that all consumer needs are met according to the laws of supply and demand. At the same time, compliance with required quality standards should be ensured at various stages of verifying whether a given product meets applicable regulations. The authors posed a research question as to whether the quality of residential architecture in Poland (based on the example of Białystok, as a representative medium-sized city) used by people with limited mobility complies with the principles of universal design.

Scope of the study

The study examined 6 existing apartment interiors used by elderly people and 24 units currently offered by developers dedicated to people with disabilities. As a result, a set of objects of an open nature was created, constituting research material enabling objective comparative analysis. The research questions formulated at the initial stage of the study concerned an attempt to diagnose the achieved standards of adaptation of multi-family residential buildings to the needs of a selected group of users. Detailed verification focused on the parameters of internal spaces in apartments offered on the primary real estate market. In most cases, these were newly designed buildings at an early stage of construction. All analyzed features concerned aspects related to accessibility and usability for people with various types of impairments, with particular emphasis on wheelchair users.

Table 1. Results of a survey on the adaptation of apartments to the needs of people with disabilities, conducted among seniors in 2025, Białystok, Poland

Item	Answers [%]	
	the existing problem	no problem
A threshold in the entrance door >2 cm in height	80	20
Balcony/loggia	5	95
Balcony door threshold >2 cm in height	100	0
Maneuvering space for a wheelchair		
in the bathroom	90	10
in the bedroom	85	15
in the kitchen	90	10
in the living room	40	60
Kitchen solutions adapted to people with disabilities	95	5
Location of electrical system switches	5	95
Fuse box location	100	0
Spatial solutions that facilitate the opening of doors and windows	55	45

Research methods

The research adopted a mixed methodology, combining quantitative and qualitative approaches, allowing for the capture of both the scale of the phenomenon and its social and design context. The following methods were used:

- statistical data analysis (quantitative approach),
- literature review (qualitative approach) – this literature served as the basis for assessing current trends in residential design and formulating design proposals,
- surveys of a representative sample of users,
- research surveys conducted in real estate agencies and fieldwork on ongoing construction sites (case studies),
- conclusions from design practice – observation and analysis of specific projects. Examples of good practice were included.

The target analyses of residential spaces were preceded by a review of subject literature and available databases. Literature studies on the discussed topic revealed a relatively extensive list of publications describing issues related to buildings constructed before the political transformation in Poland at the end of the 1990s [7–9]. So far, relatively little attention has been devoted to evaluating the most recent solutions. Therefore, undertaking research on the contemporary housing market based on the example of Białystok – as a representative medium-sized urban center in Poland – can be considered justified.

To determine the needs of people with mobility impairments and elderly individuals, a survey was conducted among a group of 20 seniors aged >70 years. The group consisted of 13 women and 7 men participating in integration activities at one of the parishes in Białystok. The survey took the form of an open discussion about the quality of residential spaces used by the respondents. Most participants were owners of cooperative apartments. All respondents declared mobility problems of varying severity. One 72-year-old man uses a wheelchair.

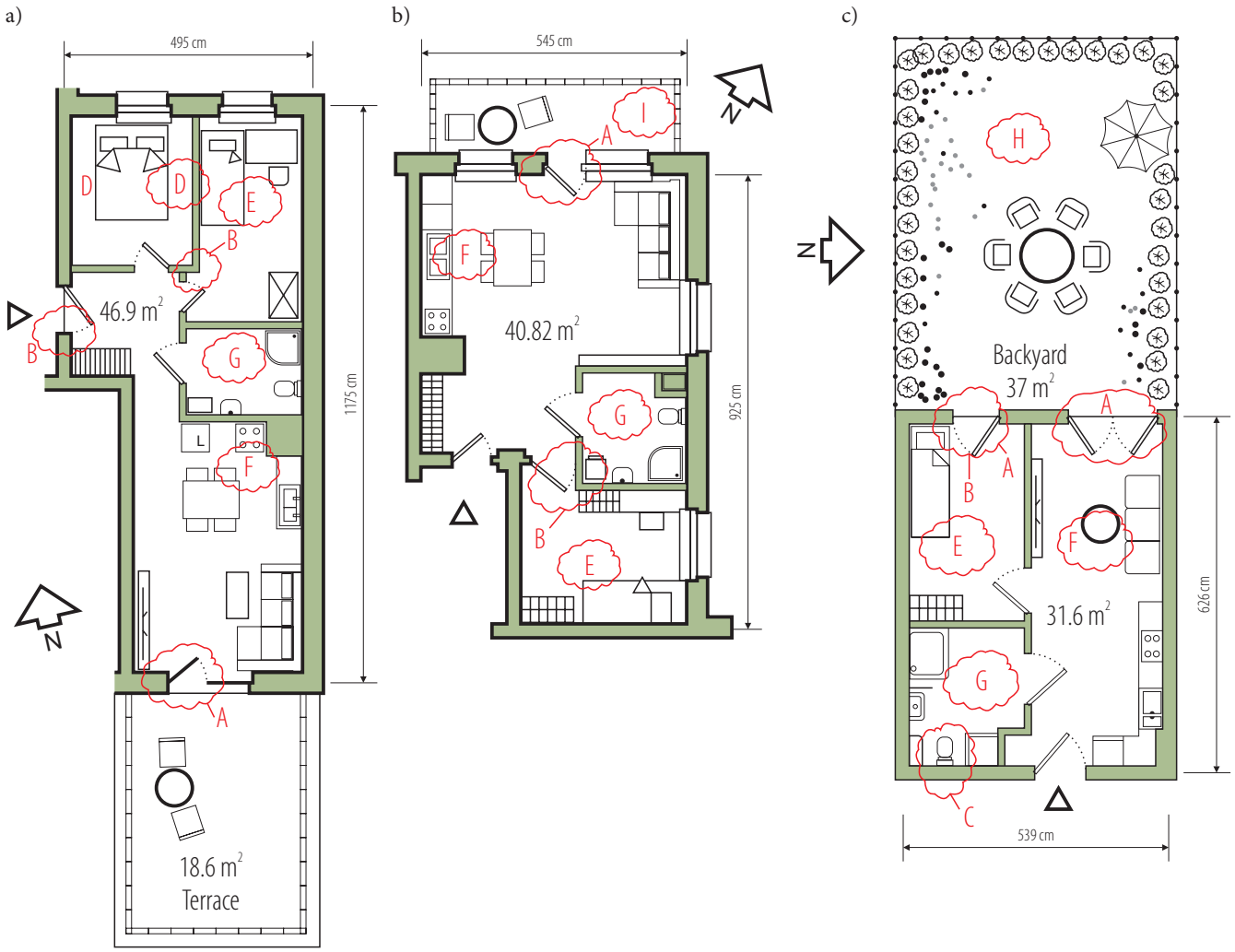
The survey was preceded by a short visual presentation on current regulations and principles of universal design. This helped better define existing problems and at the same time initiated a discussion on the level of awareness among elderly people regarding the possibilities of eliminating barriers and implementing appropriate technical solutions.

The survey made it possible to systematize a list of elements within residential interiors subject to evaluation (Table 1).

Subsequently, a research inquiry was conducted in 7 real estate sales offices regarding the available offer of apartments dedicated to people with disabilities, and field studies of the selected buildings were carried out. In most companies implementing housing developments in the Podlaskie Voivodeship, a positive and supportive attitude toward clients seeking housing adapted to mobility impairments was observed.

A standard in the real estate market is the use of catalog sheets prepared by developers for offered residential units. These are also available in electronic form on websites. Usually, apartments dedicated to people with disabilities are clearly indicated. In theory, finding an offer tailored to client requirements should not be complicated. However, the more specific the needs of future users, the harder it becomes to find a suitable product. The limited interest in this group as potential clients is also reflected in the lack of adaptation of developers' websites to the needs of people with impairments, e.g., visual impairments. Creating a separate section dedicated to these users should not be problematic.

Interviews with sales office employees indicate that most apartments are sold before the actual completion of the investment. One of the main reasons for this



The letters are explained in Table 2.

Figure 2. Examples of the apartments a) in the "Dolina Cisów" estate in Wasilków near Białystok, b) in the "Sienkiewicza" estate in Białystok, and c) in the "Zawady" estate in Białystok, Poland

is the high demand observed in the real estate market. Therefore, a decline in psychophysical fitness that may occur with age should be anticipated and planned for. However, this is rarely considered, even given the minimum construction period of about 2 years.

The examples of apartments collected during the study were analyzed in terms of their technical and functional-spatial solutions. A repetition of many solutions constituting architectural barriers was observed. Three representative apartment layouts available in the current developer offer, described as adapted for people with disabilities (Figures 2) were selected and presented. Selected interior elements were then discussed (Table 2).

All the above examples are part of multi-family housing developments. These buildings were at an early stage of construction at the time of the research.

In the 3 apartment layouts presented in the article, selected recurring unfavorable interior elements were identified, marked, and then subjected to further analysis.

Analysis of research material

The article highlights and analyzes the following problems in apartments intended for elderly and disabled people:

- current regulations reveals deficiencies in functional and technical design requirements,
- apartment location within buildings does not take into account the increased need for sunlight exposure, despite longer time spent indoors by users,
- room sizes and proportions are often insufficient for proper movement and access, especially for wheelchair users,

Table 2. Typical and frequently recurring architectural barriers in the analyzed interiors of apartments dedicated to people with disabilities – results of the survey conducted in 2025 in Białystok, Poland

Marking	Architectural barrier
A	the balcony door threshold is 6–10 cm high, making access difficult, especially for wheelchair users
B	there is insufficient maneuvering space at the door to allow the door to be opened freely from the position of a person in a wheelchair
C	the available space around the toilet is too narrow. Lack of space for handrails for disabled people near bathroom fixtures
D	too small aisle width, especially the passage and the possibility of maneuvering the wheelchair on both sides of the bed
E	no access to the bed from 3 sides – especially important when caring for a bedridden person
F	insufficient maneuvering space in the kitchen, difficulty locating the dining table, ergonomic solutions tailored to specific psychophysical needs
G	the dimensions and proportions of the bathroom are adapted to the installation of a shower tray while maintaining maneuvering space for a wheelchair, but without the possibility of accommodating a bathtub
H	there is no paved surface suitable for a wheelchair in the home garden
I	the balcony is too narrow – this makes access difficult, wheelchair maneuvering difficult, and underutilization of this important space

- imprecise legal provisions lead to unfavorable interpretations (e.g., widespread use of high thresholds in balcony doors),
- improper placement of sanitary fixtures, countertops, door and window handles, switches, and electrical outlets, limiting accessibility from wheelchair level (e.g., non-ergonomic placement of electrical panels near the ceiling).

The interpretation of current regulations regarding requirements for people with disabilities in residential units is currently limited to ensuring adequate door width, the absence of thresholds, and maneuvering space in the bathroom. These measures are insufficient.

The standard of housing dedicated to people with mobility impairments should take into account, among other things, the fact that such users spend significantly more time indoors. Considering that these apartments are usually located on the ground floor of multi-story buildings and are typically surrounded by similar developments, there is often a problem with proper daylighting and sunlight exposure. Among the analyzed apartments, units with windows and balconies facing south are rare. Due to their relatively small usable floor area, windows and balconies are usually oriented in 1 direction or – at best – in 2 directions in corner apartments.

Photo: Andrzej Dudziński

Figure 3. Typical balcony door threshold of 6–10 cm height acting as a barrier, 2025, Białystok, Poland

One of the elements in assessing the ergonomic quality of residential space in terms of adaptation to the needs of users with mobility impairments is the presence (or absence) of any obstacles or difficulties in freely accessing all rooms and functional areas.

Survey results among seniors confirm that one of the problems is limited access to outdoor space due to the use of high thresholds in balcony doors. According to regulations, their height should not exceed 2 cm, but this requirement formally applies only to entrance doors to apartments and utility rooms [2]. The lack of precise guidelines for the installation of balcony, loggia, or garden doors leads to interpretations unfavorable to users. For wheelchair users, this is often a significant barrier, sometimes impossible to overcome without assistance. Very little attention is paid to the possibility of using balconies by people with mobility impairments, for whom it is often the only opportunity for contact with outdoor space. Exposure to natural sunlight is invaluable in many therapeutic processes. Sometimes even spacious and comfortable loggias with high usability potential in warmer seasons are difficult to access [9]. Ground-floor apartments often also have direct access through the balcony to outdoor space and private gardens. Some-

a) b)

Photos: Andrzej Dudziński

Figure 4. Proper example of ramp access to a balcony in a multi-family building: a) side view showing height difference to first floor level and the entrance to the balcony, b) closing gate to the ramp, 2025, Białystok, Poland

times this serves as the main entrance for a wheelchair user. However, it usually requires additional technical solutions to make it accessible (Figures 3,4).

For many years, the building doors and windows market has offered solutions allowing the use of low thresholds <2 cm, or even completely threshold-free balcony doors. Such a system was implemented in an apartment under construction in a housing estate in Białystok for a specific wheelchair user (Figure 5). Planning various construction details at the design stage made it possible to adapt the apartment to the maximum extent possible to the needs of a person with a mobility impairment.

a) b)

Photos: Andrzej Dudziński

Figure 5. Possible use of a balcony door threshold <2 cm: a) terrace door before floor finishing in an apartment adapted for a wheelchair user, b) example of a low-profile balcony threshold, 2025, Białystok, Poland

A major design challenge is achieving optimal proportions and sizes of rooms and ensuring proper access to all elements of apartment equipment. The placement of sanitary fixtures, fittings, countertops, door and window handles, switches, and electrical outlets in a way that allows use from a wheelchair determines the functional quality of the apartment. In overly small rooms, it is difficult to arrange furniture in a functionally appropriate way without blocking movement paths for people using crutches, especially wheelchair users. In small bedrooms, it is very difficult to provide ergonomic movement space and access to the bed from 3 sides. A common mistake is, e.g., placing the electrical fuse box just below the ceiling. In case of checking or switching a fuse, it is out of reach for a person with mobility impairment. Field studies on construction sites have shown that even in new developments, relocating the fuse box to a more accessible position often meets resistance from contractors (Figure 6).

A typical and frequently repeated design error is the lack of sufficient maneuvering space near doors, allowing comfortable access to the handle and free opening of the door leaf from a wheelchair position (Table 2).

Photo: Andrzej Dudziński

Figure 6. Typical location of an electrical fuse box at a height >2.1 m; out of reach for a wheelchair user, 2025, Białystok, Poland

The conducted research shows that the apartments offered are built according to fairly similar technical and functional standards, adapted to current trends in the Polish real estate market. Their common feature is relatively small usable floor space, mainly due to high purchase prices and the financial capabilities of potential buyers. For people with disabilities and seniors, optimal usable space is particularly important. These groups naturally spend more time at home. The appropriate space and quality of the interiors in which one stays (and in extreme cases does not leave them at all) is therefore of great importance not only for the comfort of everyday use, but also serves to maintain proper mental well-being. Legal recommendations limited only to minimum bathroom dimensions are far from sufficient [2]. In reality, each room should meet other appropriate standards than the current ones, adapted to real needs. For example, ensuring convenient access to a bed from 3 sides for a person who is ill and recovering is often difficult to achieve.

Polish building regulations do not take into account the needs of people with disabilities, especially seniors, in terms of ensuring minimum apartment size. According to §94, an apartment should have a usable floor area ≥25 m² [2]. In practice, such units are very small studio apartments, in which it is hard to imagine daily life for a wheelchair user. Although no such small units dedicated to people with disabilities were found in the analyzed cases in Białystok, those available on the market usually do not provide optimal space dimensions suited to specific needs.

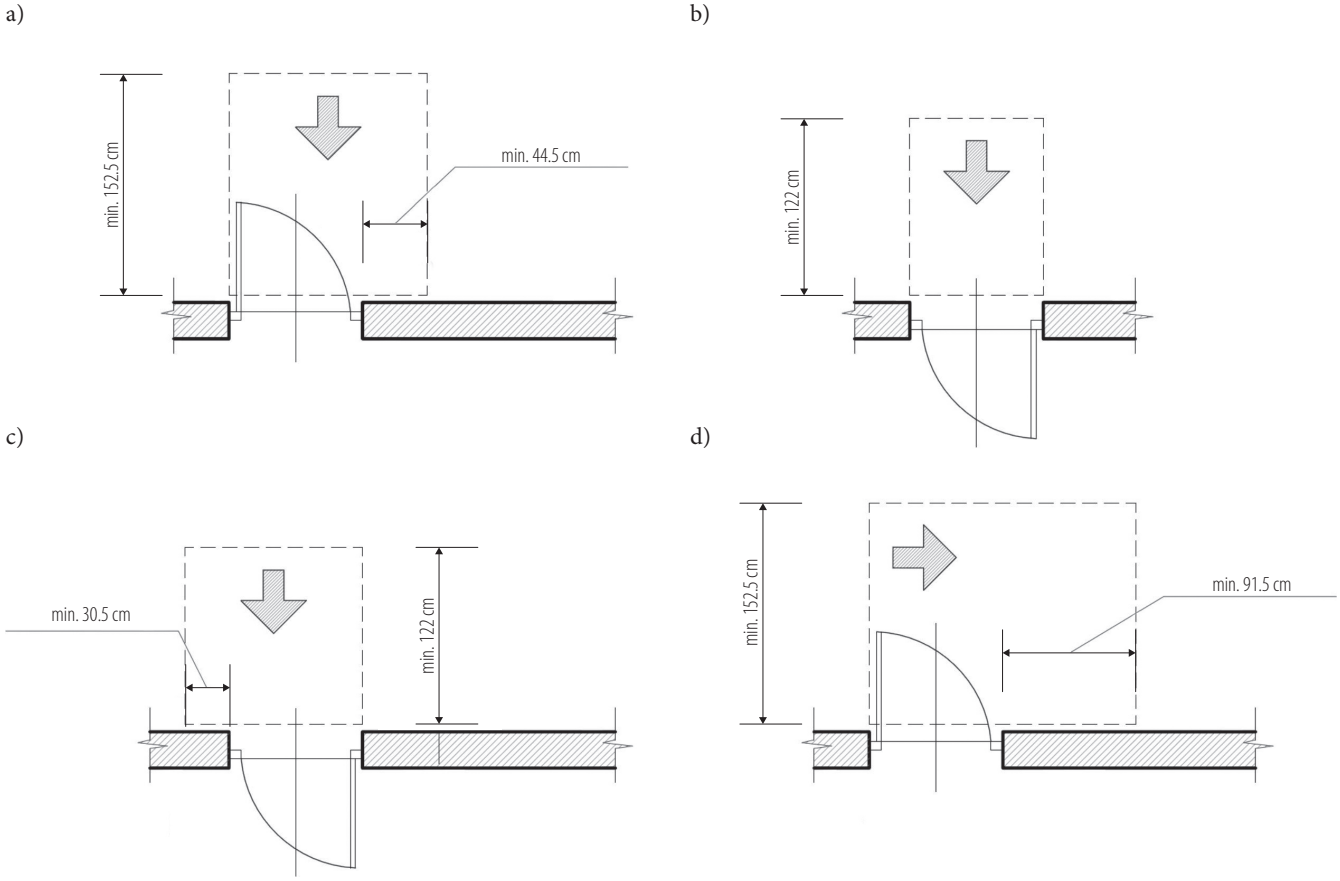
On the other hand, after adult children move out, elderly parents often remain in apartments that are too large [9], which requires more effort to maintain and generates excessive operating costs.

It is worth asking what adapting an apartment for people with disabilities actually means under current Polish regulations. The list of requirements is not very long and can be found in several legal acts. One of the basic regulations when designing residential buildings is the Regulation of the Minister of Infrastructure on technical conditions to be met by buildings and their location [2]. According to it, one should provide, among other things:

- maneuvering space in bathrooms ≥1.5 × 1.5 m (§86.1),
- threshold-free doors in bathrooms and along access routes (§86.2),
- appropriately adapted toilet, washbasin, and shower (§86.3),
- grab bars to facilitate the use of sanitary facilities (§86.4),
- corridors and hallways allowing patient transport on a stretcher and wheelchair maneuvering at direction changes (§95.1),
- corridors with a minimum clear width of 1.2 m, with local narrowing to 0.9 m over a length not exceeding 1.5 m (§95.2), but near doors already 1.5 × 1.5 m according to §95.1 [2].

This list does not include requirements for external and common spaces, as they were not the subject of the study. Analysis of literature and interviews with people with disabilities shows that there are many more obstacles and difficulties in using apartments that require adaptation to real needs. Key issues include accessibility – lack of elevators or difficult access to them, excessive external and internal stairs, and non-ergonomic functional solutions resulting from spatial constraints.

In opinion of the authors, the principles of universal design should be more consciously implemented. This means designing products, environments, programs, and services so that they are accessible to the widest possible range of users without the need for adaptation



Americans with Disabilities Act (ADA) clearances at doors require a min. clear width of 81.5 cm when the door is open at 90°. The measurement must be taken between the face of the door and the stop, with the leaf opened to a 90° angle.
Source: Authors' own elaboration based on ADA Standards for Accessible Design [11].

Figure 7. Examples of maneuvering clearances at manual swinging doors and gates: a) front approach, pull side, b) front approach, push side, c) front approach, push side with closer and latch, and d) hinge approach, pull side

or specialized design. Universal design does not exclude assistive devices for specific groups of people with disabilities if needed [10].

Guidance for better design recommendations can be found in legislation and best practices from other countries. An example is the Americans with Disabilities Act (ADA) [11] in the USA. It includes many interesting design requirements that can facilitate functioning not only for people with disabilities. An important issue highlighted there is the need to provide adequate maneuvering space near doors (Figure 7).

The ADA requirements specify, among other things, the need to maintain a clear maneuvering space of ≥44.5 cm next to doors opening inward on the handle side. In the previously discussed Polish examples (Figure 2), this distance is <10 cm in all 3 cases, which does not violate Polish regulations. In the USA, such a solution would be unacceptable. It should also be noted that even able-bodied users would benefit from easier door operation. Therefore, this requirement can be considered an example of universal design.

There are many similar situations within an apartment used by a person with mobility impairment, affecting all rooms. This results from the required actual space (not only maneuvering space) and numerous constraints related to the ergonomics of wheelchair movement.

RESULTS

People with limited mobility, including a large group of seniors, constitute an increasingly significant part of society in Poland. Statistical data indicate that this upward trend has already become permanent. In the real estate market – both primary and secondary – there is still a shortage of housing adapted to this group. This applies not only to insufficient quantity but, above all, to the quality standards of technical solutions, which do not fully meet the needs of people with disabilities.

The situation of seniors living in apartments built in the past, especially during the socialist period in Poland, which are not subject to current regulations, is a very serious issue. One example is ensuring accessibility to all floors for people with disabilities. However, this article focuses primarily on contemporary developments. In light of unfavorable demographic trends, housing policy should be shaped more forward-looking, addressing the basic needs of both present and future generations in the home environment. The standards of apartments built in Poland before 1989 – despite the authors' awareness of the importance of this issue – are discussed briefly due to the numerous existing publications on this topic.

The study presents apartments currently offered by developers in the city of Białystok, which – according to catalog information and direct interviews – are dedicated to people with disabilities. Similar trends are observed throughout Poland. Their spatial layouts and selected technical solutions affecting usability for people with special needs were analyzed and compared. Attention was drawn to recurring inappropriate functional solutions resulting from insufficiently detailed legal requirements and a lack of proper design standards. These findings may contribute to a broader discussion on developing a catalog of recommended solutions to improve the living standards of people with reduced physical and mental abilities.

DISCUSSION

The greatest opportunities for adapting apartments to specific needs occur at the design stage of an investment. Architects who understand future users' requirements can not only meet expectations but also propose many additional functional and spatial solutions. During construction, the chances of adapting apartments decrease as work progresses. Any changes made during implementation usually involve additional costs.

Although the issue theoretically affects a relatively small part of society, this group is rapidly growing. There is also a possibility that any person may, completely unexpectedly, due to various reasons, become a person with a movement dysfunction of varying severity and with uncertain prognosis for improvement of health condition. Therefore, it is worth implementing universal design principles as both a legal requirement and a standard beneficial to all.

Many solutions that facilitate daily life – if properly planned at an early stage – could reduce additional costs that increase the final price of housing. From an economic perspective, it is more efficient to anticipate and implement good design solutions early rather than introduce changes later.

It is worth mentioning government programs aimed at improving accessibility for older people and people with disabilities in the field of architecture. One example is the Accessibility Plus program [12]. As a result, many goals have been achieved, including significant changes to technical and construction regulations, securing funding for improving architectural accessibility, and conducting training for decision-makers. However, this article indicates that much remains to be done, and the research findings presented may contribute significantly to the discussion defining the potential goals of similar government projects in the future. Currently, the Accessibility Plus program focuses primarily on public, generally accessible facilities. Housing investments deserve greater institutional support. These investments could be included in subsequent editions of the program. This could lead to more effective improvements in the quality of housing.

The number of apartments for people with disabilities is not large. There are also no regulations supporting clients with special needs. Free market principles determine the functional ergonomic quality of apartments primarily for the able-bodied majority. On the other hand, the aging process affects everyone, and with age come increasing health issues. There are also dramatic situations in which anyone can lose mobility suddenly and unpredictably. As rightly noted by Gronostajska: "Every person, even the most able-bodied, goes through childhood, illness, recovery, and old age. Designing for people with diverse abilities makes it possible to create solutions that are easier to use for all users" [9].

CONCLUSIONS

The analysis of the studied apartments shows that the real needs of people with disabilities in terms of architectural and spatial solutions are not fully addressed. This applies not only to buildings constructed before 1989 in Poland but also to new developments.

Despite existing regulations requiring the provision of housing units with appropriate parameters for people with disabilities, Polish building law focuses mainly on basic requirements related to wheelchair mobility. In reality, there is a lack of housing adapted to the full range of needs of people with various mobility impairments, including seniors experiencing declining physical and mental abilities.

Achieving fully adapted living spaces is possible – provided there is cooperation from developers – through detailed analysis of user needs and implementation of solutions at an early design stage. However, due to the nature of the construction process, this involves a long waiting period for the final product. Adapting existing apartments is also possible, but some changes may be technically difficult or impossible.

Designing appropriate living environments for a diverse group of users remains a challenge for all participants in the investment process [13,14].

In article the authors present several solutions that can realistically improve the quality of life of elderly and disabled individuals. Most of these solutions are neither expensive nor difficult to implement. The key issue is the education of all stakeholders involved in the investment process (developers, designers, contractors) as well as policymakers responsible for legislation. It is essential to raise awareness, demonstrate empathy, and respond to the needs of people requiring adapted spaces – since anyone may one day be in such a situation.

With a growing senior population, investing in housing adapted to the needs of people with disabilities is more economically viable than organizing specialized assistance [15]. Therefore, it is necessary to implement universal design principles, according to which the built environment should be accessible to all users. It is not just about creating special zones and solutions, but as Kuryłowicz notes, the goal is not to create separate solutions for a minority, but to design one world for one human being by broadening the concept of who that human is [4].

ARTIFICIAL INTELLIGENCE USE

Use of AI tools for Polish-English translation parts of article only.

AUTHOR CONTRIBUTIONS

Research concept: Andrzej Dudziński, Przemysław Nowakowski
Research methodology: Andrzej Dudziński, Przemysław Nowakowski
Collecting material: Andrzej Dudziński, Przemysław Nowakowski
Statistical analysis: Andrzej Dudziński, Przemysław Nowakowski
Interpretation of results: Andrzej Dudziński, Przemysław Nowakowski
References: Andrzej Dudziński, Przemysław Nowakowski

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