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LOGISTICS OF TRANSPORT SERVICES FOR PEOPLE WITH DISABILITIES IN POLAND- CASE STUDY

ABSTRACT

This study embarks on a profound investigation into the experiences and challenges confronted by individuals with disabilities. It emphasizes their interactions with architectural structures and their engagement with assisting technologies. Based on a meticulously curated survey, the study reveals that the educational background of respondents is diverse, with secondary education emerging as the most prevalent. A significant segment of the sample, 48%, is identified with a profound degree of disability (I disability group), underscoring the need to address their unique challenges. Key findings highlight a range of architectural barriers, with stairs lacking alternative access methods as the primary impediment. This highlights the urgency for urban planning and infrastructural updates tailored for inclusivity. The frequency of outdoor activities, predominantly daily, provides insights into mobility patterns and potential challenges faced. On the technological front, the survey reveals a disparity in the adoption and satisfaction levels with assisting technologies. Only a small minority use these tools daily, with a significant segment expressing inadequacy or partial alignment with their needs. Interestingly, a pronounced affinity towards these technologies is observed among higher-educated individuals, suggesting potential links between education and technological engagement.

Furthermore, the study explores the intricacies of architectural barriers in residential areas. Larger cities, for instance, present unique challenges, such as the lack of appropriate voice signaling. Such insights advocate for location-specific interventions. This research provides a comprehensive understanding of the diverse challenges faced by individuals with disabilities in Poland. By integrating these insights, the study emphasizes the need for holistic and targeted solutions, laying the foundation for creating an inclusive and accessible societal environment. This paper also aims to explore the logistics of transport services for people with disabilities in Poland, focusing on their availability, accessibility, cost, regulations, and the awareness and education surrounding these services. By examining these factors, this paper seeks to identify the challenges faced by people with disabilities when using transport services in Poland and suggests measures to enhance the logistics of these services.

KEYWORDS

people with disabilities, transport, logistics, disability level, architectural barriers

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Availability of Transport Services for People with Disabilities in Poland

Transport Services Accessibility for Individuals with Disabilities in Poland

The realm of transportation is quintessential in the contemporary world, facilitating access to vital services, employment ventures, and socio-cultural engagements. Nevertheless, for individuals with disabilities, this becomes an intricate domain, especially in nations such as Poland.

Studies conducted on visitors to the Hajnowka Poviát in Poland highlighted the imperative need to augment travel conditions for disabled individuals [1]. In Poland, these individuals primarily utilize mobility aids like walking frames and sticks. For those who possess the capability, personal vehicles are an alternative [2]. Specialized transport services for the disabled have also been established by Poland's Ministry of Infrastructure and Development. These encompass vehicles modified for accessibility, equipped with ramps, ensuring mobility for disabled individuals, allowing them to avail public services and partake in societal events. These services, accessible across Poland, are not constrained by age, gender, or the nature of the disability. Moreover, they are complimentary for registered disabled individuals, especially for those in rural domains. The services also encompass support for physical disabilities, like aiding in boarding and alighting [2].

Historical data from the Polish National Census of 2002 provides insights into transport services' accessibility for the disabled[3]. Although this data might be perceived as dated, it emphasizes the enduring challenges that remain relevant today. The legislative framework in Poland has ratified statutes concerning public transport, aimed at augmenting its accessibility for the disabled[4]. These are pivotal in addressing barriers that might arise due to unforeseen life events like disabilities [2]. Such endeavors aim to introduce innovative shared mobility solutions in the Polish market[5]. Evaluative audits can pinpoint the deficiencies in transport services and suggest enhancements[6]. Assessments can also encompass parking infrastructure, lifts, and other amenities[7]. Outcomes from these evaluations can guide improvements in infrastructure and the overall accessibility of public transport¹. Furthermore, scrutinizing the accessibility of the Polish railway system for the disabled remains a pivotal research area[8], as augmented transport accessibility can profoundly uplift the lives of disabled individuals.

A 2016 assessment by the Polish National Audit Office (NIK) revealed that none of the ten surveyed cities offered comparable accessibility to public transport for disabled individuals as their non-disabled counterparts. This discrepancy was attributed to the absence of a robust analysis of transportation needs and the overlooking of the rights of the disabled[9]. Notwithstanding the above, the enhancement of low-floor vehicle fleets, vehicle amenities, foundational transport data, and the spatial organization within stops are vital for ensuring transport accessibility.

Disabled individuals in Poland confront numerous logistical impediments, predominantly due to restricted access to public transport. Logistic regression models have been formulated to dissect the travel constraints due to medical conditions. Social isolation and communication barriers further exacerbate the challenges[10][11]. Additionally, the disparities between urban and rural areas in Poland are pronounced, necessitating a comprehensive understanding to mitigate these logistical challenges. It is out of the question that disability limits people's participation in a considerable activity. Such people are detached from various life events that are important for their

development as a personality. This influences their self-reflection, adequacy of self-esteem.[23]

For a holistic enhancement of transport logistics for the disabled in Poland, it's pivotal to architect a model incorporating the social paradigm of disability[12]. This model should prioritize accessibility and inclusivity[13]. Moreover, it's imperative to envisage the logistical facets, such as the movement dynamics of the disabled and elderly[15]. Despite the apparent societal benefits, transport corporations often exhibit reluctance due to logistical and operational expenditures[11]. A multi-faceted approach, inclusive of a logistic perspective towards goal-setting, remains essential for achieving the envisioned outcomes[16].

The conspicuous absence of awareness and comprehensive understanding of disability inclusion is evident across various stakeholders[18]. To ameliorate this, it's crucial to engage with these stakeholders, accentuating the requisites of disabled individuals. This will mandate a design thinking approach, ensuring public transport services are tailored considering the unique needs of the disabled.

To fully grasp the transportation needs of the disabled, Poland could focus on eliminating access barriers[13]. This might include educating planners about the impact of their work on disabled individuals[22]. Such educational efforts could empower individuals to prioritize accessibility. Furthermore, Poland could also endeavor to understand the underlying motivations of disabled individuals[24], providing a clearer picture of their specific transportation requirements[12]. The United Nations Convention on the Rights of Persons with Disabilities (CRPD), a landmark in the pursuit of equality, serves as a global foundation for the design and implementation of policies related to the accessibility and mobility of disabled persons. Ratified by Poland in 2012, this convention imposes an obligation on member states to ensure that persons with disabilities can live independently and participate fully in all aspects of life. Within the context of transportation logistics, the CRPD underscores the importance of adapting transportation means and infrastructure in such a manner that they become fully accessible to individuals with various types of disabilities. This entails a rethinking and reforming of existing public transportation systems as well as ensuring that new solutions are designed with universal access in mind. The implementation of CRPD into Polish legislation thus requires not only legislative changes but also a shift in societal awareness, posing a challenge for both policymakers and society at large[19].

European accessibility standards: At the European Union level, various legal acts and initiatives aim to enhance accessibility for individuals with disabilities, such as the Directive on the accessibility of websites and mobile applications of public sector bodies and the European Accessibility Act. These legislative frameworks mandate that member states and public entities make necessary adjustments to ensure that digital platforms, products, and services are accessible to all citizens, regardless of their abilities. This includes making websites, mobile apps, and other digital tools user-friendly for people with disabilities, thus promoting their right to information and participation in the digital society. The European Accessibility Act, in particular, represents a significant step towards a barrier-free Europe, setting common accessibility requirements for key products and services across member states, ensuring a broader inclusion and facilitating the full participation of persons with disabilities in the societal fabric.[14] In Poland, a range of legal provisions are in place that govern the accessibility of public spaces and transport for individuals with disabilities.

The Act on Digital Accessibility of Websites and Mobile Applications of Public Entities, which mandates that digital services provided by public sector bodies must be accessible to all users, including those with disabilities [20].

The Act on Ensuring Accessibility for Persons with Special Needs, which provides a comprehensive framework for improving the accessibility of physical and digital environments for those requiring additional support [21].

The Regulation of the Minister of Infrastructure on the technical conditions that buildings and their location must meet, which sets out specific requirements to ensure that buildings are accessible and navigable for people with disabilities [17].

These regulations reflect Poland's commitment to creating an inclusive society by aligning national laws with international standards such as the UN Convention on the Rights of Persons with Disabilities (CRPD).

In summation, the logistics associated with transport services for the disabled in Poland is multifaceted, encompassing cost, accessibility, and transportation dynamics. In Poland has undertaken notable efforts to improve transport infrastructure and accessibility, demonstrating a commitment to inclusivity. There is always room to grow and evolve, and continued collaboration with all stakeholders will further advance these initiatives, ensuring that they fully cater to the needs of every member of society.

Research Methods

The main subject of the presented study is to examine the transport needs of people with disabilities and the architectural barriers they encounter in everyday life. The research delineates three primary areas of inquiry: Firstly, the impact of architectural barriers on the daily lives of individuals with disabilities, probing into whether such barriers in public spaces present significant challenges and potentially influence the accessibility, organization, and efficiency of their daily routines. Secondly, the sources from which respondents obtain accessibility information, with the investigation delving into various information channels, including online platforms, social media, and traditional media outlets, aiming to discern their credibility and popularity among the participants. Lastly, the study explores preferences in assisting technologies, aiming to identify which technological aids are predominantly chosen by individuals with disabilities and understand the underlying reasons for their choices, focusing on functionalities, usability, and other pivotal attributes.

To analyze the research problems and ensure the reliability of the collected data, a diagnostic survey method was employed, operationalized using a questionnaire technique. The study was conducted in 2023. The survey tool was designed to allow respondents to intuitively and efficiently understand the questions posed, encouraging them to provide honest answers. The estimated time to complete the survey ranged from 10 to 15 minutes, aiming to minimize the burden on respondents and thus enhance the quality of the collected data. The research instrument was an online survey, mainly distributed through social media. The survey consisted of 17 questions, allowing the exploration of research issues in both quantitative and qualitative dimensions. A total of 90 individuals participated as respondents, with each participant completing the response process for all the questions. This engagement from the respondents ensures data completeness, which in turn provides a solid basis for analyzing

results and responding to the research questions posed. A representative sample of respondents and prior pilot studies are essential to fully understand the phenomenon. This methodology facilitates the refinement of the investigative instrument, yielding more robust data concerning the transportation modalities utilized by individuals with disabilities and the prevalent architectural impediments encountered the towns in which they live. The conducted study offers significant insights, permitting inferential deductions regarding the observed phenomenon. Nonetheless, it is imperative to note that these results are not comprehensive and might necessitate subsequent, more intricate investigations in the forthcoming periods.

Research Results

In the context of the demographic composition of the survey respondents, several salient observations can be delineated. The gender dynamics indicate a relatively balanced representation, with females accounting for 47.78% and males constituting 44.44% of the respondents. It is noteworthy, however, that a non-trivial segment of 7.78% identified as non-binary, suggesting an inclusion of diverse gender identities in the sample. A stratification of educational qualifications reveals a broad spectrum of academic achievements among the respondents. Those with secondary education form the plurality at 33.33%. Individuals with higher education, often indicative of a more specialized knowledge base, represent 28.89%. Vocational training, pivotal for specific skill sets, accounts for 25.56%. It's imperative to note that a minority of 12.22% have primary education, which could imply foundational literacy levels. The age cohorts present a distinct distribution, with the 25-40 age bracket being the most predominant, encompassing 33.33% of the respondents. The subsequent age group, 41-55, constitutes 27.78%, highlighting the mature demographic of the sample. Individuals above 55 years form a substantial 26.67%, while the younger demographic below 25 years is comparatively underrepresented at 12.22%. Evaluating the place of residence, it is evident that both rural areas and cities with up to 100,000 inhabitants equally house 33.33% of the respondents each. Larger urban conglomerates with populations exceeding 500,000 accommodate 22.22%. Interestingly, medium-sized cities, with populations ranging between 101,000 and 500,000, are the least represented, with a mere 11.11% share. In synthesizing the above findings, the study exemplifies a diverse respondent base in terms of educational background and age distribution. The gender dynamics, while fairly balanced between males and females, underscore the importance of recognizing non-binary identities in contemporary research paradigms. The residential data further accentuates the broad geographical spectrum of the participants, spanning from rural to urban landscapes.

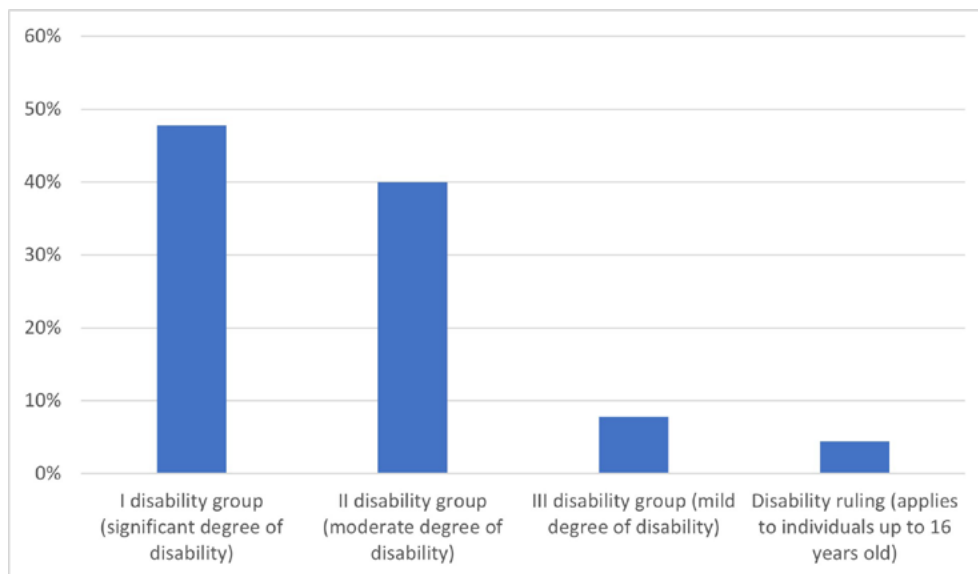


Figure 1. Degree of disability
 Source: own research.

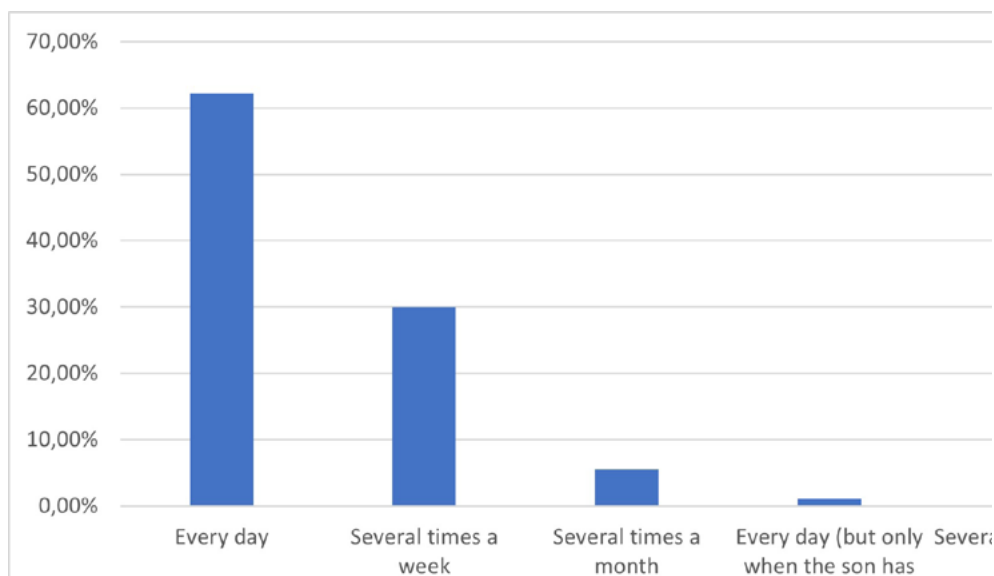


Figure 2. Frequency of leaving the house
 Source: own research.

The provided data sheds light on the distribution of respondents based on their degree of disability.(Fig. 1) This distribution is segmented into four categories, each capturing a unique facet of disability: I disability group (significant degree of disability): This category, encompassing the most profound degree of disability, constitutes a predominant 48% of the respondents, making it the most represented group in the study. II disability group (moderate degree of disability): Representing individuals with a moderate level of impairment, this group comprises 40% of the dataset. III disability group (mild degree of disability). Those with a milder form of disability are less frequent in this study, accounting for 8% of the respondents. Disability ruling (applies

to individuals up to 16 years old): A niche category, this pertains to young individuals up to the age of 16, holding a disability ruling. They form a minority in the sample at 4%. The graphical representation of these categories will illustrate a descending trend, with the I disability group being the most substantial, followed by a notable decrease in the subsequent groups, culminating in the least represented category of the disability ruling for individuals up to 16 years of age.

The data delineates that 62.22% of the respondents venture out every day. Meanwhile, 30.00% step out several times a week, with a minor proportion of 5.56% leaving only a few times a month. Interestingly, 1.11% specify that they leave daily, but only when their son undergoes therapy and rehabilitation, otherwise not at all. Additionally, 1.11% indicate that they leave their homes just a few times a year. When this data is juxtaposed with the type of disability, certain patterns emerge, though a granular exploration might be required for specific disability types. It's worth noting that the frequency of outdoor ventures may be influenced by the nature and severity of the disability, affecting accessibility and mobility. Furthermore, the place of residence paints a nuanced picture. Urban dwellers in cities with a population up to 100,000 predominantly leave daily, followed by those who venture several times a week. On the other hand, in larger cities with populations ranging from 101,000 to 500,000, the daily frequency remains dominant but is complemented by a segment leaving several times a month or under specific circumstances. In the most populous cities, exceeding 500,000 inhabitants, daily excursions remain predominant, but there's a notable group leaving several times a week. Rural residents prominently show daily outings, signifying the universal nature of this trend irrespective of the urban-rural divide. In essence, the frequency with which individuals with disabilities leave their homes is not just a reflection of their daily routines but also interplays with factors such as the nature of their disability and their residential milieu.

Table 1. Architectural Barrier

Architectural Barrier	Number of answers
Stairs in places where there's no option for an elevator or ramp	57
High curbs	51
Absence of elevators for people with disabilities	50
Lack of low-floor buses	42
Absence of suitably inclined ramps	39
Lack of appropriate audible signals at pedestrian crossings	23
Absence of suitable audible signals in public transport	21
Lack of appropriate audible signals on platforms	19
Traffic light buttons placed too high	18
Absence of tactile paths in public spaces	17
Lack of Braille signage	10
... and a few other individual or less common responses with 1 mention each.	

Source: own research.

The table encapsulates an in-depth enumeration of architectural barriers confronted by individuals with disabilities in their residential vicinities. The data, meticulously collated from respondent feedback, provides an invaluable lens into the daily impediments that these individuals grapple with, furnishing crucial insights for urban planning and infrastructural development.

At the zenith of these barriers is the prevalence of stairs in locations devoid of alternative elevator or ramp options, with a staggering 57 answers. This underscores a significant accessibility impediment. Following closely are high curbs and the conspicuous absence of elevators tailored for individuals with disabilities, cited 51 and 50 times respectively. The absence of low-floor buses, noted in 42 answers, reiterates challenges in public transportation accessibility. Additionally, the paucity of suitably inclined ramps, highlighted 39 times, stresses the need for reconsidering current architectural designs. Furthermore, the data accentuates sensory accessibility issues. Audible signals at pedestrian crossings, crucial for the visually impaired, are lacking, as indicated by 23 answers. Similarly, the deficit of suitable audible signals in public transport and on platforms, with 21 and 19 answers respectively, signifies a potential hazard and inconvenience. The table 1 also elucidates other challenges, such as the dearth of tactile paths in public spaces and the nonexistence of Braille signage. While these barriers might seem quantitatively less significant, they are qualitatively profound, especially for specific segments of the disabled population. In essence, this data is instrumental in pinpointing pivotal areas of intervention. By prioritizing the rectification of these barriers, policymakers, urban planners, and civic authorities can significantly enhance the quality of life for individuals with disabilities, fostering a more inclusive and accessible environment.

Table. 2.

Question	Yes (%)	No (%)	Partially (if applicable) (%)
Use of Assisting Technologies in Everyday Life	31.11	68.89	N/A
Perceived Adequacy of Digital Technologies	15.56	44.44	40.00

Source: own research.

The table delineates respondents' engagement with and perception of assisting technologies. Two pivotal aspects are accentuated: the daily utilization of such technologies and the perceived adequacy of digital technologies in catering to their needs. Approximately one-third (31.11%) of the respondents reported a daily reliance on assisting technologies, underscoring their integral role in facilitating routine tasks and activities for this segment of the population. Conversely, a significant 68.89% asserted that they do not employ these technologies on a daily basis, revealing a potential disparity in access, awareness, or perceived utility.

The data evinces a palpable sentiment regarding the alignment of digital technologies with the specific needs of people with disabilities. A mere 15.56% believe that such technologies are fully congruent with their requirements, suggesting room for significant improvement. A notable 44.44% of respondents opined that these technologies are not adequately adapted, pointing to potential limitations in functionality, accessibility, or user-friendliness. Interestingly, a sizeable 40.00% felt that while digital technologies offer some benefits, they only partially meet their needs. In synthesis, the table underscores the imperative of refining the design, outreach, and capabilities of assisting

technologies. While a segment of the population finds immense value in them, there's an evident demand for more tailored and comprehensive solutions that resonate with the broader needs of people with disabilities.

In examining the nexus between educational levels and the adoption of assisting technologies, distinct proclivities surface:

1. Primary Education:

- A substantial 72.73% within this demographic eschew the daily employment of assisting technologies.
- In contrast, a minority of 27.27% indicated regular utilization.

2. Higher Education:

- 57.69% of this echelon refrains from harnessing assisting technologies on a quotidian basis.
- However, an intriguing 42.31% profess their daily allegiance to these tools, insinuating a pronounced affinity within this educational stratum.

3. Vocational Education:

- Amongst this cohort, 73.91% abstain from the daily incorporation of assisting technologies.
- Yet, 26.09% acknowledge their use.

4. Secondary Education:

- 73.33% of respondents within this bracket do not partake in the daily consumption of assisting technologies.
- A residue of 26.67% attested to their utilization.

A meticulous observation delineates that individuals possessing higher educational credentials manifest a marginally augmented predilection for the deployment of assisting technologies vis-à-vis their peers from primary, vocational, or secondary educational backgrounds. This inclination can potentially be ascribed to an amalgamation of determinants, encompassing heightened cognizance, amplified accessibility, or an accentuated imperative stemming from vocational or individual exigencies.

After analyzing the association between the place of residence and frequently encountered architectural barriers, we observed the following patterns:

There are 48 distinct combinations of architectural barriers mentioned by respondents. This reflects the complexity and variety of challenges faced by people with disabilities in different living areas.

For instance:

- In cities with a population of over 500,000, 15% of respondents mentioned the lack of appropriate voice signaling at pedestrian crossings, in public transportation, and on platforms as a prevalent barrier.
- In the same cities, 5% of respondents pointed out the challenges posed by excessively high curbs and elevated locations of buttons on traffic light signaling.

However, due to the extensive variety of combinations, a comprehensive analysis requires a deeper examination of each combination across all residential areas.

To provide a more actionable insight, we could focus on the most frequently mentioned barriers across all places of residence or dive deeper into the specifics of one particular residential area.

Conclusions

Following the conducted scientific research, we were able to obtain answers to the posed research questions, which are presented in this article.

The comprehensive analysis of the survey data yielded nuanced insights, pivotal for understanding the experiences and challenges of individuals with disabilities. Key conclusions are enumerated below: The gender distribution within the sample showcased equilibrium between females (47.78%) and males (44.44%). The identification of 7.78% of respondents as non-binary underscores the evolving landscape of gender identities and emphasizes the importance of inclusivity in contemporary research. Furthermore, the academic profile of respondents was variegated, with secondary education leading at 33.33%. The age distribution was predominantly skewed towards the 25-40 age bracket. The disability gradient among the participants was distinct. Those with a significant degree of disability (I disability group) constituted the majority at 48%. This highlights the necessity to cater specifically to the needs of this segment given their prevalence in the sample. The data accentuated a predominant trend of daily outdoor excursions, with 62.22% of respondents venturing out daily. This frequency, however, could be contingent upon the nature and degree of disability, as well as the specific living environment, emphasizing the multifaceted nature of mobility patterns. The survey unveiled a plethora of architectural barriers, with stairs sans elevators or ramps emerging as the most formidable. Such findings underline the urgent need for infrastructural modifications to foster inclusivity and ease mobility for individuals with disabilities. Engagement with assisting technologies illuminated a disparity in access and satisfaction. While a minority harnesses these technologies daily, a significant portion perceives them as either inadequate or only partially fulfilling their needs. This calls for a targeted improvement in technological solutions tailored for this demographic. Delving into the intersection of education and technological usage, a discernible trend was observed. Individuals with higher educational qualifications exhibited a heightened proclivity towards the employment of assisting technologies. This suggests that educational background might influence technological awareness and accessibility. A granular examination of architectural barriers vis-à-vis residential areas depicted intricate patterns. Larger cities, for instance, evidenced barriers such as the absence of appropriate voice signaling. Such findings advocate for a tailored approach to barrier rectification, taking into account the specific challenges of diverse residential milieus.

In sum, the study underscores the multifaceted challenges faced by individuals with disabilities, spanning architectural, technological, and socio-demographic dimensions. These findings pave the way for targeted interventions, policymaking, and infrastructural developments, emphasizing the paramountcy of fostering an inclusive environment that is attuned to the specific needs of this demographic.

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LOGISTYKA USŁUG TRANSPORTU DLA OSÓB NIEPEŁNO- SPRAWNYCH W POLSCE – STUDIUM PRZYPADKU

STRESZCZENIE

Niniejszy artykuł przedstawia analizę doświadczeń i wyzwań, przed którymi stoją osoby niepełnosprawne. Podkreśla ich interakcję z obiektami architektonicznymi oraz zaangażowanie w technologie wspomagające. Badanie wykazało, że wykształcenie respondentów jest zróżnicowane, jednak dominuje wykształcenie średnie. Znacząca część próby, aż 48%, identyfikuje się ze znacznym stopniem niepełnosprawności (I grupa niepełnosprawności), co podkreśla potrzebę sprostania ich wyzwaniom. W opracowaniu wskazano na szereg występujących barier architektonicznych, z których główną są schody, bez alternatywnych metod dostępu. Podkreśla to pilną potrzebę planowania urbanistycznego i aktualizacji infrastruktury, dostosowanych do specjalnych potrzeb. Analiza częstotliwości aktywności na świeżym powietrzu, głównie codziennych wyjść, pozwoliła na określenie wzorców mobilności osób niepełnosprawnych oraz zidentyfikowanie potencjalnych wyzwań, z jakimi się borykają. Badania wykazały istotne różnice w adaptacji i poziomie zadowolenia z technologii wspomagających; tylko niewielka część respondentów korzysta z tych narzędzi codziennie, przy czym znaczna ich część wyraża niedostosowanie lub częściowe dostosowanie do swoich potrzeb. Przywiązanie do tych technologii obserwuje się wśród osób z wyższym wykształceniem, co sugeruje potencjalne powiązania między edukacją, a zaangażowaniem technologicznym. Ponadto, badanie wskazuje na bariery architektoniczne w miejscach zamieszkania respondentów. Na przykład, w większych miastach stanowią one większe wyzwania dla osób niepełnosprawnych, takie jak brak odpowiedniej sygnalizacji głosowej. Badanie wskazuje na potrzebę opracowania rozwiązań dostosowanych do specyficznych warunków lokalnych. Przeprowadzone badanie umożliwi wskazanie wyzwań, z jakimi borykają się osoby niepełnosprawne w Polsce. W opracowaniu podkreśla się potrzebę całościowych i ukierunkowanych rozwiązań, które mogą przyczynić się do stworzenia dostępnego środowiska społecznego dla osób niepełnosprawnych. Celem artykułu jest m.in. ocena logistyki usług transportowych dla osób niepełnosprawnych w Polsce, ze szczególnym uwzględnieniem ich dostępności, przystępności cenowej, kosztów, aż po świadomość i edukację na temat tych usług. Analizując te czynniki, artykuł podejmuje próbę zidentyfikowania wyzwań stojących przed osobami niepełnosprawnymi podczas korzystania z usług transportowych w Polsce i proponuje działania, które mogą usprawnić logistykę tych usług.

SŁOWA KLUCZOWE

osoby niepełnosprawne, transport, logistyka, stopień niepełnosprawności, bariera architektoniczna



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