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ACCESSIBILITY TO PUBLIC INSTITUTION FACILITIES FOR PEOPLE WITH DISABILITIES IN NOVI SAD - EUROPEAN CAPITAL OF CULTURE 2021

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Abstract. *Persons with disabilities and reduced ability to move need to be provided with unimpeded access, movement, staying and working in all buildings with equal treatment as the rest of the people. The objective of this paper was to determine accessibility to public service institutions and educational institutions, as well as possible statistically significant differences in the presence of elements of accessibility between such institutions. The total of 154 buildings in Novi Sad was processed (70 educational institutions and 84 public service institutions). Measuring lists were composed for the purpose of collecting data based on the Rulebook on Technical Standards of Accessibility RS 2013, with the additional use of a meter and subjective visual assessment of a measuring entity. The obtained data were processed in the programme SPSS for Windows, version 20. For the purpose of determining differences among the parametric variables, a T-test for independent samples was used, and in order to determine the differences among the non-parametric variables, a χ^2– test was used, at the deduction level of $p \leq 0{,}05$. The obtained results indicate the existence of statistically significant differences in the elements of accessibility among the public service and educational institutions in the territory of the City of Novi Sad, especially with respect to the following variables: type of entrance doors ($p=0.027$) and opening side of the entrance doors ($p=0.000$).*

Key words: *persons with disabilities, facilities, accessibility, standards.*

1. INTRODUCTION

Ensuring accessibility to public institutions (health centres, post offices, pharmacies, theatres, cinemas, sport facilities, pre-school institutions, primary and secondary schools, faculties, banks, etc.), represents an integral part of the Strategy for improving the position of persons with disabilities and their better life quality (Government of the RS,

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2007). After ratifying the United Nations Convention on the Rights of Persons with Disabilities with its objective being improving, protecting and ensuring equal human rights and fundamental freedoms of all persons with disabilities, as well as improving the respect of the innate dignity of the respective group of people, the Government of the Republic of Serbia adopted a set of laws and bylaws: *Law on Preventing Discrimination of Persons with Disabilities* (2006), *Strategy for Improving the Position of Persons with Disabilities in the Republic of Serbia* (2007), *Rulebook on Technical Standards of Accessibility* (2013), as well as the *Rulebook on the technical standards of planning, designing and building facilities, ensuring unimpeded movement and access for persons with disabilities, children and senior citizens* (2015). The given rulebooks govern and prescribe technical standards of accessibility as well as the urban planning and technical terms for spatial planning. All of the aforementioned pertains to the public area such as roads, pedestrian areas, access points to facilities intended for public use and special design of the interior of such facilities that must be adapted for use by the persons with disabilities. As part of this, observance of the compulsory accessibility elements must be assured.

According to the World Health Organisation - WHO, five types of health can be distinguished: physical, psychological, social, functional and economic. Disturbance in any of the given categories of health, conditions setbacks in the rest of the health categories, with the consequence of reduced physical abilities (Fejzić, 2007). Persons with reduced physical abilities are the ones whose organism, due to certain physical, psychological or functional deficiencies, is incapable of performing its tasks at an optimal level. However, such persons are members of every community, and they make a large social category in all countries worldwide (Fejzić, 2007).

In Article 3 of the basic provisions of the Law on Preventing Discrimination of Persons with Disabilities of the Republic of Serbia (2006) there is the following notion *"persons with disabilities signifies persons with inborn or acquired physical, sensory, intellectual or emotional disability which due to social or other obstacles do not have the possibilities or have reduced possibilities to participate in social activities at the same level as others, regardless of whether they are able to realise them by using technical aids or support services".*

One of the biggest obstacles in life of young persons with disabilities is the assumption that disability means lack of choice (Morris (2001). Persons with disabilities should have the right – just as everyone else – to choose the way they are going to live their lives, and not to have their choices imposed by doctors, social workers, charities or the society. The Movement of Persons with Disabilities has the following requirements: independence (possibility of choosing own life organisation), civil rights (possibility of playing a full-fledged social role), autonomy (possibility of forming and living a personal life plan) and unimpeded movement (possibility of free movement the same for everyone) (Leutar, 2006).

Barriers represent a disturbance in communication and orientation, which might hinder and/or prevent the possibility of free movement of persons with reduced ability to move or their unimpeded access to the facilities where they reside and work (Rulebook on Technical Standards of Accessibility of the RS, 2013, Article 3). Therefore, it is necessary to apply technical solutions in designing and constructing buildings, which would ensure unimpeded access, movement, residence and work in the facilities to such persons at equal terms as for other people. For this reason, it is imperative that the built environment is properly designed and made all- inclusive (Danso, Ayarkwa & Ayirebi, 2011).

"Accessible building, its part or equipment (ramp, stairs, lift, vertical lifting platform, inclined foldable lifting platform, entrance area, communication, toilet, bathroom, kitchen, room, classroom, working space, apartment, changing cabin, shower, beach and pool entrance area, theatre seats, phone, fax, ATM, electrical installations, doorknobs and window handles, counter, noticeboard, orientation plan for moving inside the building, bus stops and platforms, parking lots, public pedestrian areas, traffic lights, pedestrian crossing, pedestrian island and crossroads) means a facility, part of a building or equipment which ensures meeting the mandatory elements of accessibility prescribed by the Rulebook on Technical Standards of Accessibility" (Rulebook on Technical Standards of Accessibility of the RS, 2013, Article 3).

Mandatory elements of accessibility refer to the elements of designing and building, determining the size, properties, installations, devices and other equipment for the purpose of ensuring access, movement, staying and work of persons with disabilities and reduced ability to move with equal quality as for other people (Rulebook on Technical Standards of Accessibility of the RS, 2013, Article 3).

Mandatory elements of accessibility are the following: elements of accessibility for overcoming altitude differences; elements of movement accessibility and staying in specific space - residential buildings and public facilities; elements of accessibility to public transport (Rulebook on Technical Standards of Accessibility of the RS, 2013, Article 5).

Pedestrian surroundings and accessibility to public facilities and institutions represent the first and very significant obstacles to active inclusion of persons with disabilities or persons with reduced ability to move into regular life activities. The objective of this paper was to determine the aspects of accessibility to public institution facilities and educational institutions, as well as possible statistically significant differences with regard to the existence of accessibility elements among the respective institutions.

2. METHODS

Sample

The sample consisted of the total of 154 institutions in the territory of the City of Novi Sad. Out of the total number of analysed samples, 70 samples were composed of educational institutions, of which: 12 public faculties, 8 private faculties, 19 pre-school facilities, 18 primary schools and 13 secondary schools. The remaining 84 samples were the public service institutions. Such institutions were composed of: 18 post offices, 21 banks, 19 pharmacies, 9 cafés, 10 sport facilities, 7 health centres.

Measuring instruments sample

For the purpose of determining differences in the existence of architectural barriers in various institutions of the City of Novi Sad, measuring lists were used composed in accordance with the Rulebook on Technical Standards of Accessibility of the RS 2013, a meter and the subjective visual assessment of the measuring entity. The research parameters were the following: ground-level and floor aspects of the facility, wheelchair ramp, wheelchair ramp handrails, ramp width, ramp surface slipperiness or coarseness, type of the entrance doors and entrance door opening side.

Description of the measuring procedure

The research data were recorded in the measuring lists, after visiting all the assessed institutions. Certain accessibility elements important for the research were also checked and measured.

Data processing methods

The data were analyzed using IBM SPSS Statistics 20.0 (SPSS ID: 729225). For the purpose of determining the differences among the parametric variables, a parametric method known as the T - test was used for independent samples. This T - test is the best choice for this type of parametric variables and it gives the best results in percentages and clear differences. For purpose of determining the differences among the non-parametric variables, a nonparametric method known as the χ^2– test. The nonparametric method χ^2 gives the best insight in all differences among public and educational institutions in nonparametric variables which are used and which are significant for this study. Both tests clearly show all the percentages of fulfilment of conditions of standards significant for the study. The statistical significance was established at the assessment level of $p < 0.05$.

3. RESULTS

The results of numerical and percentage rates of the type of entrance doors to the educational and public institutions in Novi Sad (Table 1), show that there is statistically significant difference in the type of entrance doors among the educational and public institutions in Novi Sad, in favour of public institutions, in favour of automatic doors. There are eight automatics doors in public institutions and only one automatic door in educational institutions in Novi Sad.

Table 1 Numerical and percentage rates of the type of entrance doors to the educational and public institutions in Novi Sad

Type of entrance doors		Institutions		Total
		Educational	Public	
Regular doors	Number	72	75	147
	% compared to the type of the entrance doors	49.0%	51.0%	100.0%
	% with respect to the institution	98.6%	90.4%	94.2%
Automatic doors	Number	1	8	9
	% compared to the type of the entrance doors	11.1%	88.9%	100.0%
	% with respect to the institution	1.4%	9.6%	5.8%
Total	Number	73	83	156
	% compared to the type of the entrance doors	46.8%	53.2%	100.0%
	% with respect to the institution	100.0%	100.0%	100.0%

$\chi 2=4.885$, df=1, p=0.027

Legend: χ^2- hi square statistics; df - degrees of freedom; p - level of significance

Numerical and percentage rates of the opening sides of the entrance doors to the educational and public institutions in Novi Sad, are presented in Table 2. There is a statistically significant difference with regard to the opening sides of the entrance doors

among the educational and public institutions in Novi Sad have been observed, in favour of outward doors in educational institutions.

Table 2 Numerical and percentage rates of the opening sides of the entrance doors to the educational and public institutions in Novi Sad

Entrance door opening side		Institutions		Total
		Educational	Public	
Inward	Number	18	52	70
	% with respect to the entrance door opening side	25.7%	74.3%	100.0%
	% with respect to the institution	25.0%	68.4%	47.3%
Outward	Number	54	24	78
	% with respect to the entrance door opening side	69.2%	30.8%	100.0%
	% with respect to the institution	75.0%	31.6%	52.7%
Total	Number	72	76	148
	% with respect to the entrance door opening side	48.6%	51.4%	100.0%
	% with respect to the institution	100.0%	100.0%	100.0%

χ^2=27.965, df=1, p=0.000

Legend: χ^2- hi square statistics; df - degrees of freedom; p - level of significance

Percentage rates of elements of accessibility of educational and public institutions in Novi Sad are presented in Table 3.

Table 3 Percentage rates of elements of accessibility of educational and public institutions in Novi Sad

Elements of accessibility and their characteristics		Percentage of accessibility elements which are in standard	Percentage of accessibility elements which are not in standard
Ramp	Width of ramp	13.2%	18.7%
	Handrails on ramps	19.4%	12.5%
	Surface of ramp	23.1%	8.8%
Type of entrance doors	Width of entrance doors	40.6%	59.4%
	Entrance door opening side	56.2%	43.8%

The percentage results rates of elements of accessibility of public and educational institutions which do not have accessibility elements at all and percentage rates of ground level in Novi Sad are presented in Table 4.

Table 4 Percentage rates of elements of accessibility of public and educational institutions which do not have accessibility elements at all and percentage rates of ground level in Novi Sad

Elements of accessibility of institutions which do not have accessibility elements at all	Width of ramp	68.1%
	Handrails on ramps	68.1%
	Surface of ramp	68.1%
Ground level of institutions	Floor level	80%
	Ground level	20%

Compared to other parameters tested: ground level of educational institutions and public institution facilities in Novi Sad, existence of the inclined ramps and handrails on the same, slippery or rough surfaces of the inclined ramps and their width, and the width and types of front doors in the examined facilities, the results of our study show that there are no statistically significant differences among the examined institutions.

4. DISCUSSION

Training of people with severe physical traumas (who must temporarily or permanently use a wheelchair) for return to the previous environment and the way of life they used to live, is the main objective of any rehabilitation (McColl, 2001). The most common problem encountered by persons with disabilities (users of wheelchairs, crutches or walkers) is limited mobility due to inaccessibility to public institution facilities, difficult movement at pedestrian crossings, and the like.

Hence, the objective of this paper was to determine the aspects of accessibility to public institution facilities and educational institutions, as well as possible statistically significant differences with regard to the existence of accessibility elements among the respective institutions.

Novi Sad is the second largest city in Serbia. Like most cities, it was faced with the problem of architectural barriers that prevented the mobility of people with disabilities. The City of Novi Sad identified the problem of accessibility to public and cultural facilities for these people (Figure 1), and in 2012 the Assembly of the City adopted the Strategy on Accessibility to Public Facilities for People with Movement Difficulties ("Official Journal of the City of Novi Sad", No. 21/2012), as well as the Rulebook regulating this area.

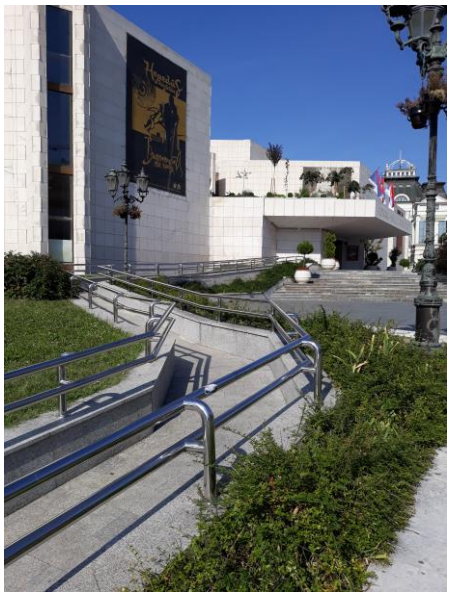

Fig. 1 The Serbian National Theatre (exceptional access to the cultural building)
(Photo: Branka Protić – Gava)

The newly built facilities have been adapted by these rules and accessible to persons with disabilities, but older facilities are not subject to this regulation. The City of Novi Sad has invested funds to make the public institution facilities accessible to the public, but conditions for accessibility are not always met in practice with fulfilling the legal regulation. The proof of that is the access to the Main Post Office building in front of which a wheelchair lifting platform was installed but was never operational (Figure 2). This problem should be resolved. Barriers on the roads and accessibility to public institution facilities, schools, faculties, banks, health institutions, theatres, museums, but also to residential buildings and houses must be identified and removed, as noted by many researchers (Bodaghi & Zainab, 2012; Chiwandire & Vincent, 2017).

Fig. 2 Main Post Office building (wheelchair lifting platform has never been operational) (Photo: Branka Protić – Gava)

The results of our study show that about 80.0% of the examined institutions in Novi Sad are not at ground level (80.8% of educational and 79.3% of public institutions), which entails the obligation for them to ensure fulfilment of the required accessibility elements, in this case, ramps. However, a total of 60.2% of the examined facilities are without ramps (55.9% are educational and 63.8% are public institutions). Our results do not coincide with the results of the Centre for Development of Civil Society Zrenjanin (2011) which states that only 9.67% of institutions have appropriate ramps, only two facilities are fully accessible and most facilities are without handrails on the ramps. Namely, the results of our study show that the situation of accessibility to facilities in Novi Sad compared to Zrenjanin is better. Nevertheless, it indicates the need to build ramps on all facilities of public and educational institutions which are still without them.

Some of the inclined ramps built in front of public institutions and residential buildings are not well placed and regardless of the fact that the regulation is respected, persons in wheelchairs cannot use them without the help of another person. Our conclusion coincides with the results of the Bodaghi & Zainab study (2012), in which the view of persons with disabilities differs from the view of architects in terms of the functionality of the ramps. Namely, people with disabilities evaluated the functionality of the same with low grade.

In planning the technical standards when building the ramps, we found out that not all of the ramps met the condition for existence of necessary elements such as handrails (Figure 3), which is shown in the results of our study.

Fig. 3 Ramp which does not meet the standards
(Photo: Branka Protić – Gava)

Half of the examined facilities are without handrails on the ramps (51.6% of educational and 48.4% of public institutions). These results coincide with the results of Bodaghi & Zainab (2012), which state that conditions of accessibility to public buildings and university libraries in Zanjan Province in Iran are not assessed as good enough for people with disabilities and conclude that it is necessary to adapt the design.

Also, the standards prescribe that the ramp should be solid, flat and slip-resistant. The study has established that 72.5% of the examined institutions have ramps that comply with the standards, i.e. 76.9% of educational and 68.0% of public institutions. The results of our study show that no significant difference in respect of the surface of ramps was established among the examined categories of institutions, but the results were better in educational institutions. Public facilities had a better average ramp width of 119.4 cm, although difference among the institutions was not statistically significant, and the width is not in accordance with the Rulebook on Technical Standards of Accessibility of the Republic of Serbia (2013), which prescribes the minimum ramp width of 120 cm. These

results show that the situation regarding accessibility elements to public institutions in Novi Sad is far more favourable than in Zrenjanin (*Zrenjanin, the city accessible to all, 2011*).

The results of our study coincide with the results of Bacha study (2015) which states that many ramps are narrow, with damaged surfaces, of non-standard inclination (over 6%), lacking handrails. Ramps in public buildings do not meet standards, as they are inaccessible for wheelchair users, but also for mothers with children in prams. The author concludes that the main problem of accessibility to buildings and public places equipped with elements of the same is not in disregarding the legal framework, but in the way in which design or adaptation of the existing ones was carried out. Some of the public institutions resorted to the solution of adapting the back doors of the buildings for people with disabilities, thus, on the one hand, fulfilling the legal framework, and on the other hand, making such population invisible and in some way marginalizing them (Bacha, 2015). There are several institutions in Novi Sad that have resorted to this solution.

Some of the health institution facilities in Novi Sad have inadequate access conditions, which coincides with Gačić study (2013) which concludes that the health institution facility examined has inadequate access to the facility, which implies an inadequate width of the ramp, the lack of handrails, curbs and appropriate surface of the ramp. Such results show that it is impossible or very hard for disabled people and people with movement difficulties to move freely, get adequate health care, get educated, visit cultural events (Centre for Development of Civil Society, 2011).

The results of our study show that statistically significant differences between the educational institutions and the public institutions exist only for the types of front door and the side to which a front door is open (inward or outward). Out of the total number of facilities tested in our study, only 5.19% have automatic front doors - 9.52% at the public institutions and 1.43% at facilities of educational institutions (Faculty of Civil Engineering).

According to the Rulebook on Technical Standards of Accessibility of the Republic of Serbia (2013), doors should be opened outwards at institutions highly frequented by people. The study found a statistically significant difference in favour of educational institutions. As for the width of front doors at public institutions, it should be at least 90cm. In our study, the average width of front doors in educational institutions is 80.28 cm, while in the public institutions it is 83.03 cm, which indicates their necessary adaptation.

The University of Novi Sad has paid full attention to establishing good conditions for studying and staying at the University for all students, as well as to development of support to students with disabilities. The University's central building was built by the standards of "universal design": an inclined ramp was installed, all facilities within the building are accessible, the elevator was installed providing accessibility to all floors, there is a toilet for people with disabilities. However, buildings of most faculties have not been fully adapted to students with disabilities, and regardless of the fact that most buildings have the inclined plane for accessed, facilities within the building are not accessible to such student population. At some faculties the access to student services is not adequately enabled, at most faculties the toilets are not adapted, and access to higher floors is not ensured. We must also note the fact that, in addition to a small number of primary and secondary schools in Novi Sad, the majority have not fully met the required legal standards for better accessibility to them by persons with disabilities.

5. CONCLUSION

Inaccessibility to facilities and the movement in a space full of architectural barriers make people with disabilities face dangers which make the built environment unpleasant and unsafe and can even prevent some people from using the space at all.

In spite of the existing legal obligation on accessibility of public facilities for people with movement difficulties, people with disabilities still have difficulty to move smoothly around the city of Novi Sad, the city - the European Capital of Culture 2021, as well as to unhindered access to facilities for education, health care, cultural events and the like.

We have established that the conditions of accessibility to the public institution facilities and educational institutions in Novi Sad do not fully meet the standards for the mobility of persons with disabilities, such as: inclination, height and length of the ramps are inadequate; there are no handrails or no handrails on both sides of all ramps; the handrails length on the ramps are inadequate; access to ATMs is inadequate (height and distance due to the presence of a stair below the ATM); the width of most of the entrance doors is narrow - it does not meet the standards; access to higher floors of institutions is disabled because there is no lift; toilets are not adjusted for people with disabilities. Tactile fields of safety of pedestrian crossings and pedestrian islands are good in the city center but not in the distant parts of Novi Sad. For this reason, it is necessary to meet the requirements for proper design of the environment and to facilitate the movements of people with disabilities. Therefore, it is also necessary to fulfil the requirements in practice following the legal standards.

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PRISTUPAČNOST OBJEKTIMA JAVNIH USTANOVA ZA OSOBE SA INVALIDITETOM U NOVOM SADU – EVROPSKOJ PRESTONICI KULTURE 2021.

Osobama sa invaliditetom i smanjenom mogućnošću kretanja neophodno je obezbediti nesmetan pristup, kretanje, boravak i rad u svim građevinama i to na jednakoj osnovi kao i ostalim osobama. Cilj ovoga rada bio je da se utvrdi pristupačnost objektima ustanova javnog korišćenja i vaspitno-obrazovnih ustanova grada Novog Sada. Obrađeno je ukupno 154 objekta u Novom Sadu (70 vaspitno-obrazovnih ustanova i 84 ustanove javnog korišćenja). Za prikupljanje podataka sačinjene su merne liste na osnovu Pravilnika o tehničkim standardima pristupačnosti RS 2013, a korišćeni su još metar i subjektivna vizuelna procena merioca. Dobijeni podaci obrađeni su u programu SPSS for Windows, verzija 20. Za utvrđivanje razlika između parametrijskih varijabli korišćen je T-test za nezavisne uzorke, a za utvrđivanje razlika između neparametrijskih varijabli korišćen je χ^2– test, na nivou zaključivanja $p\leq0,05$. Dobijeni rezultati upućuju na postojanje statistički značajnih razlika u elementima pristupačnosti između ustanova javnog korišćenja i vaspitno-obrazovnih ustanova na teritoriji grada Novog Sada, i to u sledećim varijablama: tip ulaznih vrata ($p=0.027$) i strana otvaranja ulaznih vrata ($p=0.000$).

Ključne reči: *osobe sa invaliditetom, objekti, pristupačnost, standardi.*