

Mobility and transport in old age: recent evidence and implications

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Abstract: As the population ages, the need for flexible transport services, but also ensuring the accessibility of public spaces and means of transport become essential to prevent the exclusion of older persons from the community life. The aim of this article is to provide recent empirical evidence about the degree of use of means of transport by older persons, including their perception regarding the accessibility of public transport and spaces. To attain this objective, a survey was conducted among older persons (65 and over). Our study shows that the accessibility of public spaces and access to assistive devices that facilitate the mobility of older persons do not meet the needs of this population category, especially in rural areas. About a third of the participants admit that public transport is not adapted to the needs of older persons and the use of public transport is much more frequent in urban areas, compared to rural areas. The results of our study highlight the need for appropriate policy measures in the medium and long term period in the field of active aging and transport.

Keywords: older persons, transport, mobility

1. Introduction

The social inclusion of older persons is an important concept on the public agenda of national governments, in the context of the phenomenon of population aging (Börsch-Supan et al., 2015; Myck et al., 2017). The main areas related to the social inclusion of older persons are transport/mobility, social participation (cultural, sports, political, etc.), available income, social, socio-medical and health care services, living conditions. In this article, aspects related to transport and mobility in old age are addressed, highlighting the national legal framework regarding the transport/mobility in old age. The aim of this article is to provide recent empirical evidence about the use of transport means by older persons, including their perception regarding the accessibility of public transport means and public spaces.

2. Mobility and transport in old age

Older people and aspects regarding their mobility/transportation are elements for achieving social inclusion in old age. Social exclusion in relation to transport and mobility takes into account the lack of flexible public transport services (including in rural areas), dependence on private transport options, limited access to buildings or institutions for dependent older people (Draulans et al., 2018) . The exclusion of older persons from the transport systems produces chain effects on other areas of social exclusion and is appreciated as a form of social exclusion of major importance for the older people (Kneale, 2012).

Studies carried out in Great Britain (Social Exclusion Report, 2006) emphasize that the exclusion of older persons from public transport systems and improper living conditions are the factors with the highest potential for social exclusion, since (a) most older people spend a considerable amount of time at home; (b) most older people (especially older women) rely on public transport systems.

The factors that determine social exclusion in relation to transport are (Social Exclusion Report, 2006): the cost, accessibility and availability of means of transport, the reduced physical autonomy of the older persons that limits the use of transport systems, acts of violence/aggression that can occur during the use of public transport. Hoff (2008) observes that there are differences in terms of access to means of transport between urban and rural areas. Thus, access to means of transport is better in the urban and metropolitan areas, with rural areas facing the lack of means of public transport, which leads to the isolation among older persons, the accentuation of social exclusion through the impossibility of accessing social and health care services.

Scientific literature (Kim, 2003; Shrestha et al., 2017; Spinney et al., 2009) indicate that people's life expectancy is increasing worldwide as a result of improved living standards and medical advances. The aging process is accompanied by physiological changes that can have significant consequences on mobility, influencing the social inclusion of older persons. Consequently, older people tend to travel less than other adults and may change their transportation behaviour (Shrestha et al., 2017). Research in the field (Gewalt, 2011) has identified a list of age-related changes and the consequences of these changes on mobility, respectively: reduced flexibility and strength, impaired visual perception, increased vulnerability to bone fracture, etc. Studies in the field emphasize the need to develop strategies at the community level that allow the to older persons to remain involved and active as long as possible.

Numerous scientific research projects such as the FP7 project TRACY (Transport needs for an aging society, 2011-2013) (European Commission, 2013) have provided detailed recommendations to EU decision-makers on improving transport and mobility options for older citizens. Within the FP7 TRACY project, the research team identified 146 documents from 29 countries classified as falling within the guidelines at EU level regarding people with reduced mobility, 63% of these documents being exclusively dedicated to older people. The research results support the development of flexible systems that meet the mobility needs of the older persons in order to ensure their good social inclusion.

3. The national legislative context regarding the field of transport/mobility related to the group of older persons

The Romanian legal framework in the field of social inclusion does not provide specific indicators in the field of mobility/transport for any vulnerable group of people. At the time of the development of the system of indicators, the field of mobility/transportation of people from vulnerable groups as an element of obtaining their social inclusion was not addressed in the scientific literature and, therefore, was not found in the set of primary and tertiary indicators developed. Considering, however, that the system of indicators is in the process of revision to respond to the new strategies in the field of social inclusion in Romania, it is expected that a series of indicators to be developed.

In the *National Strategy for the promotion of active aging*, the field of mobility/transport is included in strategic objective 3. *Obtaining a higher degree of independence and safety for people with long-term care needs*, within the chapter dedicated to promoting the active and dignified social participation of the older persons (3.2) and refers only to *the accessibility of the infrastructure of public spaces* (3.2.2). Physical, cognitive and informational barriers to mobility and independence are considered to limit the ability of older people to actively participate in society and to have a dignified life. Considering the high costs involved in the necessary improvements to Romania's public infrastructure and public transport systems, the priority areas focus on both new constructions and the development of projects to rehabilitate the old infrastructure, by removing physical obstacles and the attain an efficient use of existing resources. The measures aim: (1) legislative changes; (2) empirical assessments of public infrastructure barriers among beneficiaries; (3) development of assistive technologies; (4) control and monitoring elements (Table 1).

Table 1 Policy measures defined in the *National Strategy for the promotion of active aging* and the protection of older persons for the period 2015-2020

Policy measures
1. Revision and strengthening the legal regulations regarding the accessibility of the physical and informational environment as well as the public space
2. Carrying out a pilot study on the older population for a city or municipality to identify the most important public infrastructure obstacles (outdoor spaces, buildings, access ways, transport networks) for their mobility and independence
3. The development and diversification of technologies and assistive devices necessary to facilitate personal mobility
4. Development of reasonable accommodation measures in both employment and lifelong learning
5. Revision of municipal and intercity public transport fleets to identify the number of buses/wagons that comply with universal requirements and the proportion of routes covered by such buses/wagons

6. Reallocation of accessible car parks to maximize the number of routes covered and modification of displayed programs by adding information on transport accessibility

Source: National Strategy for the promotion of active aging for the period 2015-2020

All measures are defined under specific objective 2.2. *Improving the accessibility of the infrastructure of public spaces to meet the specific needs of the older population* from the Operational Action Plan for the implementation of the National Strategy for the promotion of active aging for the period 2015-2020. The related monitoring indicators, along with funding elements and institutions involved, can be found in the table below (Table 2).

Table 2 Directions and monitoring indicators provided for in the Operational Action Plan for the period 2016-2020

Direction	Implementation
<p><i>2.2.1. Revision of accessibility and carrying out a pilot study in a city or municipality to identify solutions to increase the accessibility of public infrastructure to ensure the mobility and autonomy of older people</i></p> <p>Implementation period: 2018-2020 Funding sources: State budget, European structural and investment funds (FESI) Indicators: 1 annual control campaign; 1 pilot study carried out in this regard</p>	<p>Actions financed by the state budget</p>
<p><i>2.2.2. Carrying out a research in the field of diversification of technologies and assistive devices necessary to facilitate personal mobility</i></p> <p>Implementation period: 2018-2020 Funding sources: European Structural and Investment Funds (ESIF) Indicators: at least one completed research project in the field</p>	<p>There is no information available regarding the actions taken to respond to the direction of action</p>
<p><i>2.2.3. Checking the fleets of municipal and interurban public transport to identify the number of means of transport that comply with universal requirements and the proportion of routes served by such buses/wagons, by developing a methodology for monitoring and controlling the means of public transport, approved by Government Decision; programs for disseminating the mentioned monitoring and control methodology and training staff in this regard; the inclusion in the annual control plans carried out by the social inspectors of checking car parks.</i></p> <p>Implementation period: 2018-2020 Funding sources: state budget, local budgets. Indicators: Normative act(s) developed and approved; minimum 42 persons trained to carry out monitoring and control activities; minimum 42 checks performed</p>	<p>There is no information available regarding the actions taken to respond to the direction of action</p>

<p>2.2.4. <i>The inclusion of measures to make rural infrastructure accessible for the older persons and people with functional limitations in rural areas, in local action plans</i></p> <p>Implementation period: 2017-2020 Funding sources: - Indicators: 1,000 local plans with accessibility measures for the older persons completed (a third of rural localities).</p>	<p>There is no information available regarding the actions taken to respond to the direction of action</p>
<p>2.2.5. <i>The inclusion of measures to make urban infrastructure accessible for the older persons and people with functional limitations in the urban environment, in local action plans</i></p> <p>Implementation period: 2017-2020 Funding sources: - Indicators: 100 urban plans with accessibility measures made in the urban environment</p>	

Source: *Operational Action Plan for the period 2016-2020*

According to the Monitoring Report carried out by the Ministry of Labor and Social Solidarity in 2018 regarding the implementation of the actions from the Plan of measures related to the National Strategy for the promotion of active aging, in 2018, the National Agency for Payments and Social Inspection carried out a thematic control campaign "Verification of access assurance to people with disabilities in the physical environment, respectively hotel units, which offer spa treatment and medical recovery services". As part of the thematic control, 146 hotel units that provide spa treatments and medical recovery were subjected to checks, of which 30.82% offered spa treatment and medical recovery services, and 69.18% only accommodation services. At the level of hotel units subject to control, deficiencies and irregularities were found for the remedy of which 877 measures were ordered and, at the same time, 57 contraventional sanctions were applied. In addition, through the health legislation (Ordonanța de Urgență no. 8/2018), the definition of medical devices was revised by including assistive technologies in this category. In this way, the possibility of accessing non-reimbursable external funds was created to grant disabled people technologies and assistive devices and access technologies.

In the National Strategy regarding social inclusion and poverty reduction for the period 2015-2020 and in the Strategic Action Plan for the period 2015-2020, the only reference to the mobility of the older persons is made within the key area 3.6.4.3. *Services for the older persons* and the specific objective 3.6.4.3.1. *The regulation, development and financing of a spectrum of personalized services to meet the specific needs of the elderly*, with an emphasis on the home care system which provides as a priority action until 2020 the consolidation of social services at the community level, including in the social infrastructure system, accompanied by investment in community services such as day care, respite centers and other support services for independent or assisted living (transportation, personal assistants, assistive devices, interpreters, etc.).

However, publicly available information on assistive technologies and devices developed within the social infrastructure system is lacking.

4. Methodology

4.1. Research objectives

The following research objectives were addressed in this article:

- What is the degree of use of transport means by the older persons inside and outside the community?
- What is the perception of older persons regarding the accessibility of public transport?
- What is the perception of older persons regarding the accessibility of outdoor spaces?
- Facilitating access to assistive means of movement (trolleys, support devices such as crutches, canes, etc.).

4.2. Research instrument and method

To attain these objectives, a questionnaire-based survey was conducted among older persons (65 years and over) in Romania. The data were collected between November 11-27, 2021. The sample was stratified according to development regions (eight regions), locality type (large urban, medium-small and rural) and residential area (urban, rural). When selecting the number of localities, the allocation of at least 7 interviews per locality/sampling point was considered. The target population of the survey was represented by non-institutionalized Romanian people aged 65 and over, the total sample size being 802 older adults, aged 65 and over. The sampling error of the survey was $\pm 3.5\%$ for the national sample.

Data were collected within the project PN 19130401 - Innovative strategies to promote social inclusion at older ages in the context of new societal challenges, were used. carried out with the support of the Ministry of Research and Innovation (MCI). The dimension analyzed in the questionnaire is Transport and Mobility and includes the following indicators:

- The degree of use of public transport within the community;
- The degree of use of public transport outside the community;
- Accessibility of public transport for the older people;
- Accessibility of outdoor spaces (buildings, access roads) for the older people.
- Use of assistive devices (trolleys, support devices, etc.) in order to move;
- Facilitating access to assistive means of movement (trolleys, support devices such as crutches, canes, etc.);

The questionnaire was applied using the TAPI method (face-to-face operator-assisted interviews completed on a tablet). The application used was VoxCo (an interview platform that also allows the application of offline questionnaires). The consent to participate in the survey was requested from the respondents at the beginning of the interview, all ethical aspects regarding confidentiality, informed consent and anonymity being addressed during the data collection

process. The collected data were analyzed using IBM SPSS Statistics 21, according to gender, age and place of residence

5. Results

5.1. The degree of use of public transport by older persons inside and outside the community

Moving outside the home is a key element that facilitates the social inclusion of older persons. This is confirmed by the older participants in the survey, 86% of them considering that it is important and very important to move outside the home. The analysis of opinions according to *gender*, *residential area* and *age* groups reveals the following aspects:

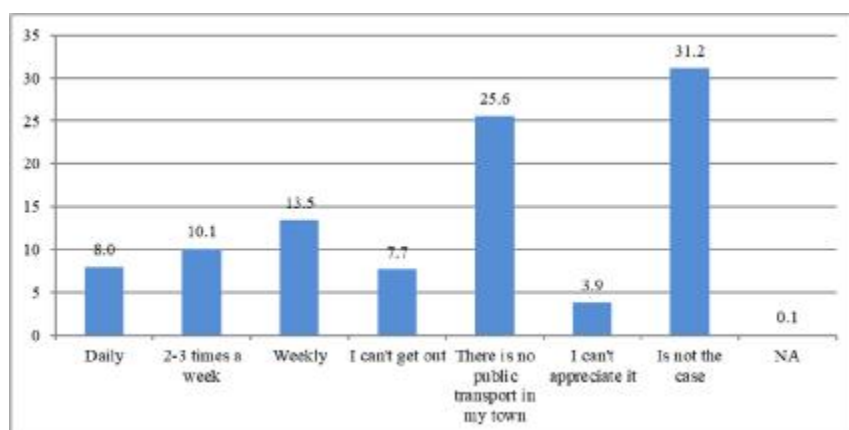
- Men, compared to women, tend to consider mobility outside the home slightly more important (88.1% cumulative percentage for the answer options important and very important in the case of men, compared to 84.3% cumulative percentage for the same answer options in the case of women);
- Older people from rural areas consider mobility outside the home important in a relatively lower percentage than those from urban areas (83.6% cumulative percentage for the important and very important response options in the case of older persons from rural areas, compared to 87.8% cumulative percentage for the same answer options in the case of older persons in the urban environment);
- As age increases, the importance of mobility outside the home decreases: it is more important for older persons aged 65-74 years old to move outside the home (89% cumulative percentage for the important and very important response options), while for the older persons 85 years and over, the importance of mobility outside the home registers a lower percentage (69.3% cumulative percentage for the important and very important answer options).

5.1.1. *The degree of use of means of public transport within the community*

Studies carried out in Great Britain (Social Exclusion Report, 2006) emphasize that the exclusion of the older persons from public transport systems and improper living conditions are among the factors with the highest potential for social exclusion, since (a) most older persons spend part of considerable amount of time at home and (b) most older persons (especially older women) rely on public transport systems..

The data from the survey show that 31.2% of the older respondents stated that they do not travel within the community with transport means and 25.6% mentioned the fact that there is no means of public transport in their locality. 13.5% of the older persons move weekly within the community by means of transport and only 8% do so daily (Figure 1).

Figure 1 The degree of use of public transport within the community (%)



Source: Sociological field survey conducted among older persons, PN 19130401, 2021.

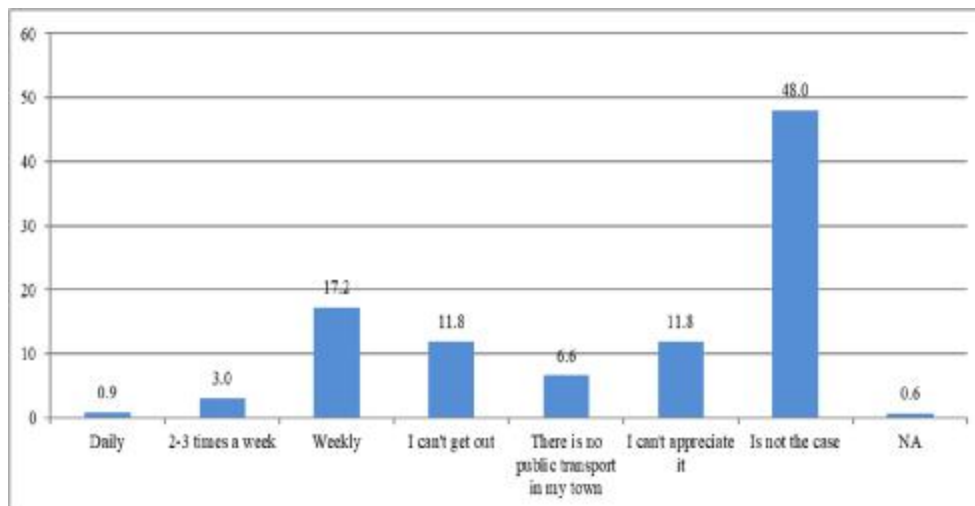
- The analysis of the opinions according to *gender, residential area* and *age* groups reveals:
- A slightly higher percentage of women report that they use public transport weekly within the city, compared to men: 14.2%, compared to 12.5%. The difficulty of movement is also 2.6 times higher in case of older men. Also, a higher percentage of men compared to women prefer not to use public transport within the community: 36.9%, compared to 26.9% for women;
 - As expected, older persons from urban areas travel weekly using public transport within the locality in a higher percentage than those from the rural areas, 19.2%, compared to 6.4%;
 - As age increases, the frequency of mobility using the public transport within the locality decreases (daily, 2-3 times a week or weekly): 33% of the older persons aged 65-74 years old travel using the public transport within the town, while the older persons aged 85 years and over do so in a percentage of 20.5%.

5.1.2 The degree of use of means of public transport outside the community

48% of the older persons declared that they do not travel outside the community with transport means and 6.6% mentioned the fact that there are no means of public transport outside

their locality. The movement of older persons outside their locality is not a frequent behavior, only 17.2% of them moving outside the community weekly and only 0.9% doing so daily (Figure 2).

Figure 2 The degree of use of public transport outside the community (%)



Source: Sociological field survey conducted among older persons, PN 19130401, 2021.

The analysis of opinions according to *gender, residential area* and *age* reveals the following aspects:

- The frequency of travel (daily, 2-3 times a week, weekly) is slightly higher for men when considering the use of means of transport for travel outside the locality (22.2%, compared to the percentage recorded in case of women - 20.2%). A slightly higher percentage of men than women prefer not to use public transport outside the community, 51.2%, compared to 45.6%, the percentage recorded in the case of women;
- Older persons from rural areas travel weekly by public transport outside the town in a higher percentage than those from urban areas: 25.3%, compared to 10.6%;
- Mobility outside the town (daily, 2-3 times a week, weekly) is more frequent in case of older people aged 65-74 years old, 23.6% of them traveling in this way and relatively similar for older respondents aged 75-84 years and 85 years and over (14.%, respectively 15.4%).

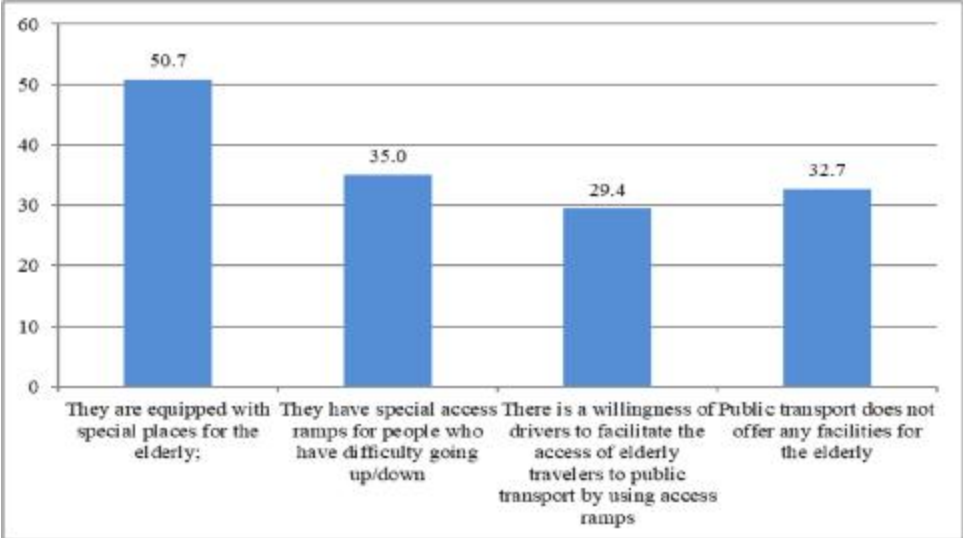
5.2. The accessibility of public transport

The reasons why the older persons do not use public transport to travel either within or outside the community may also be related to the degree of accessibility for older persons. A

series of studies (Hoff, 2008) identify differences in terms of access to means of transport between urban and rural areas. If the access to the means of transport is better in the urban and metropolitan areas, rural localities face the lack of public transport, which leads to the isolation of older persons and the increase of social exclusion, as people are more likely not to be able to access social and health care services.

Data from the INCSMPS survey (2021) indicate that only 50.7% of the older persons consider that public transport has special seats for the older passengers, while only 35% believe that public transport ensures special access for people with reduced mobility. The availability of drivers to facilitate the access of older travelers to public transport by using access ramps is reduced as considered by only 29.4% of the respondents. A third of the older persons believe that public transport does not offer any facility for older travelers (Figure 3).

Figure 3 Assessment of accessibility of public transport for older persons (%)



Source: Sociological field survey conducted among older persons, PN 19130401, 2021

The analysis of opinions according to *gender*, *residential area* and *age* reveals the following aspects:

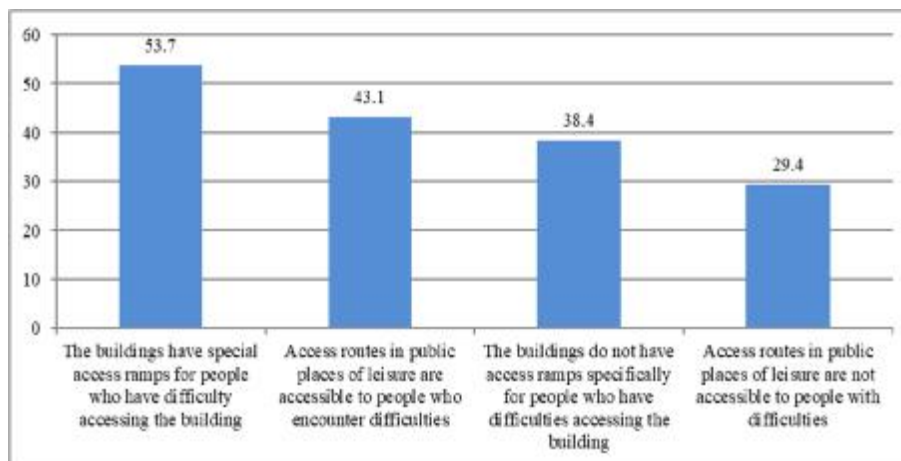
- Women generally evaluate the accessibility of public transport more critically than men, the differences being of 13 percentage points when the provision of public transport with special places for older persons is evaluated;
- The older persons from rural areas are much more critical than those from the urban area, over a half of them (50.9%) considering that the public transport do not offer any facility for older persons;
- The older persons aged 85 and over believe in a very small extent, 9.1%, that there is a willingness of drivers to facilitate the access of older travelers to public transport by using

access ramps, the most optimistic about this aspect being the older persons aged 75-84 years.

5.3. The accessibility of outdoor spaces

Regarding the accessibility of outdoor spaces, 53.7% of the older persons believe that, in general, buildings have access ramps especially for people who encounter difficulties, 43.1% considering that access to public leisure places is facilitated by pathways that are accessible to people with disabilities. It should be noted that more than a third of respondents (38.4%) believe that, in general, buildings do not have access ramps especially for people who have difficulties accessing the building, while 29.4% believe that access to public places for spending free time is not facilitated by paths that are accessible to people who encounter difficulties (Figure 4).

Figure 4 Assessment of the degree of accessibility of outdoor spaces (buildings, access ways) for the older persons (%)



Source: sociological field survey conducted among the elderly, PN 19130401, 2021

The analysis of opinions according to *gender*, *residential area* and *age* reveals the following aspects:

- Women generally negatively evaluate the accessibility of external spaces (buildings, access ways) compared to older men. Similar opinions are expressed with regard to access to public leisure places;
- The older persons from rural areas are slightly more judgmental than those from urban areas when they evaluate the degree of accessibility of outdoor spaces (buildings, access roads) for older persons, more than a third of them (39.2%) considering that buildings do not have access ramps, compared to 37.8% percentage recorded in the case of the older respondents from urban areas;

- The older persons aged 75-84 years are the most critical, compared to the older respondents from the other two age groups, regarding the accessibility of outdoor spaces (buildings, access ways), 48% of them consider that the buildings do not have access ramps for people who encounter moving difficulties and 32.2% appreciate that access to public leisure places is not facilitated by accessible access paths for older persons.

5.4. Facilitating access to assistive means of mobility

Social innovations, including in the field of assistive devices, are new ideas that respond to social needs, create new social relationships and new forms of collaborations. These innovations can be products, services or models that respond to unmet needs in an efficient way. The role of social innovations in the mobility/transportation of the older persons is essential. The increase in the number of older persons requires a reconsideration of existing mobility systems to support independent living, so that older citizens can continue to fully participate in social activities.

The data from the conducted survey indicate that only 12.6% of the older persons use assistive devices (trolleys, support devices, etc.) in order to move. A slightly higher percentage of women than men use assistive devices (13.3% compared to 11.6% for men). There are no visible percentage differences between rural and urban older persons regarding the use of assistive devices (trolleys, support devices, etc.). The degree of use of assistive devices increases with age from 9.4% in the case of the older persons in the age group 65-74 years to 33.3% in the case of the older persons aged 85 years and over.

Only 9.9% of respondents believe that the local public authority facilitates access to assistive devices (trolleys, support devices, etc.) to help them move. Similar to the indicator the use of assistive devices (wheelchairs, support devices, etc.) in order to move, there are no visible percentage differences between women and men or older persons from rural and urban areas regarding the facilitation of access to assistive means of movement (wheelchairs, support devices such as crutches, canes, etc.) by local public authorities (LPA). As the age group increases, the percentage of those who believe that LPAs facilitate their access to assistive means of movement decreases from 13.2% in the case of the older persons in the 65-74 age group to 0% in the case of the older persons aged 85 years and over.

6. Discussion and conclusion

Results of our research are in agreement with previous studies (Draulans et al., 2018; Gorman et al., 2017) emphasizing the importance given to mobility among older persons. Our study shows that although the specialized literature claims that movement outside the home is a key element that facilitates the social inclusion in old age, there are differences between the older persons regarding the importance given to movement inside and outside the community: over 60% of the respondents travel, at least once a day, with a means of public transport within the

locality, while only over a half of the respondents travel outside the community using a means of public transport. Moving within the community is more frequent in the case of older people living in urban areas, compared to the respondents from the rural areas. A possible explanation can be linked, on the one hand, to the fact that in urban communities, both in small and even more in large ones, older people have to move to access different types of services, as emphasized previously by Hoff (2008). If we also take into account the low efficiency of the implementation of policy measures aimed at supporting the mobility of older people, we understand why a small share of the respondents use public transport, whether it is inside or outside the community. Moreover, Stanley et al. (2011) provide significant evidence suggesting that mobility is positively correlated with the likelihood of social inclusion among adults. Other studies (Naegele et al., 2011) show that including other forms of social participation (for example volunteering) is limited in the case of older people by access to a mean of transport, along with other reasons.

Half of the respondents appreciate that the transport means are adapted to the needs of the older persons and approximately one third admit that the means of public transport do not offer facilities for older persons. In 2007, the World Health Organization (WHO) initiated the age-friendly cities model to encourage the development of age-friendly communities (WHO, 2007). The legislative measures intended for the social inclusion of the older persons show that there is still no national political commitment aimed to encourage mobility in old age and implicitly to reduce the risk of social exclusion among the older population. Although policy measures have been provided in this sense, the legislative commitment lacks the finality of creating concrete options regarding the accessibility of mobility among the older persons (World Health Organization, 2007). Mercado et al. (2010) point out that as the population ages, commitment is needed in three major policy areas: the provision of mobility options, legal and institutional approaches, and the creation of accessible mobility environments. Cirella et al. (2019) emphasize that as the population ages, it is necessary to increase the awareness of the needs regarding mobility at advanced ages, including the promotion of social innovation to find effective solutions adapted to the needs of this category of the population.

As the results of our study show, the accessibility of public spaces and the access to assistive devices that facilitate the mobility of the older persons do not meet the needs of the older population. The planning of transport systems must consider ensuring accessibility, availability and acceptability (McDonald et al., 2012; Shrestha et al., 2016), as well as specific solutions for urban, peri-urban and rural areas (Cirella et al., 2019). Similar to the results obtained in other studies, the accessibility of public spaces (buildings, access roads) and public transport means is more deficient in rural areas, as the study carried out by Shergold and Parkhurst (2012) points out.

Some limitations and strengths of our research could be highlighted. A limitation of our research is that the factors that constitute barriers to the use of public transport or public spaces

were not analyzed. Due to the sample used, the results of our study could serve as a basis for policy decisions to promote greater mobility among older people.

In conclusion, the needs of the older persons regarding transport and the accessibility of public spaces require an additional approach, as increasing mobility at advanced ages implies a knowledge of transport needs and the integration of these needs into strategic approaches in the fields of social, education and transport.

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