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Unveiling the experienced age-friendliness of older people in Bucharest: A comprehensive study using the validated Romanian age-friendly cities and communities questionnaire and cluster analysis

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ABSTRACT

Current global trends show that different regions of the globe face an increased level of urbanization, and there is a swift aging process from the Western to the Eastern European countries. Romania is a typical country expecting to triple the percentage of the older population aged 65 and over in the next 30 years. Urban policies often neglect such demographic perspectives. The World Health Organization launched the age-friendly city and communities' movement that proposes solutions for older people to age actively by improving their welfare and social participation. The concept of an age-friendly city comprised eight dimensions: (1) outdoor spaces and buildings; (2) transportation; (3) housing; (4) social participation; (5) respect and social inclusion; (6) civic participation and employment; (7) communication and information; and (8) community support and health services. It raises some important questions about how to measure and evaluate urban policies in this framework. Current work presents the process of adaptation and validation for the Romanian older population of a standardized tool - the Age-Friendly Cities and Communities Questionnaire (AFCCQ). The validation study was conducted in Bucharest (n = 424) on a representative sample of older people, who were asked to rate their life in the city, following the eight dimensions and an additional one regarding their financial situation. Four clusters were differentiated in the analysis, resulting in different views of older adults on their experience of living in the city, showing that people's socio-economic status, their living arrangements and health situation play a role in shaping their views on city life. The results highlight the importance of standardized tools to design urban policies following an age-friendly agenda.

1. Introduction

According to the United Nations, more than half of the people around the globe live in urban areas (56.5%), and the percentage will continue to grow, reaching around 68% percent in 2050 (UN, 2022a, UN, 2022b). Regions around the world have undergone different patterns of urbanization, with North America and Europe currently being the most urbanized areas (over 75% of the people living in urban communities). Eventually, people will grow old in cities and experience all aspects of the urban environment in their later life. Romania, for example, is a critical case when one considers the demographic predictions for 2050. Therefore, the country is interesting for urban studies researchers. Estimates by the United Nations (2019) show that the percentage of persons above 60 years of age will be the highest in Eastern European countries, with Romania having the highest median age of any European country. The population aged 80 year and over is expected to have tripled by 2050 as compared to 2020.

The intersection between the two global trends, namely the ever-increasing rate of urbanization and the aging of societies, has led to the World Health Organization's (WHO) age-friendly cities and

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communities' movement that proposes solutions for older people to age actively and enjoy their later life by improving their welfare and through socio-economic participation. The *Global Age-Friendly Cities Guide* (WHO, 2007a) was launched as part of the agenda. The main document describes the main areas to be considered in creating livable, age-friendly urban communities. In Europe, numerous urban communities are following the age-friendly city agenda and have become members of the network. The process is much slower in the Eastern European countries, except for Poland and Slovenia with multiple cities that have joined the network (WHO, 2023).

One could argue that, at the European level, countries with more economic resources were first in embracing the age-friendly agenda in their urban policies. Cities in those countries are more prepared to join the network and monitor their progress, while being committed to ensuring a better life for the older population (Plouffe & Kalache, 2010). However, the age-friendly agenda and the commitment to creating a better urban environment for the older population became particularly relevant in Eastern Europe, as less economically developed countries such as Lithuania and Romania are expected to reach the highest median age in Europe in 2050 (Chawla et al., 2007; Ivan et al., 2020; Jakovljevic et al., 2021; van Hoof et al., 2018).

Besides the local interest and the awareness at the level of citizens and authorities, there are other challenges regarding the assessment of the age-friendliness in different cities (Buffel & Phillipson, 2018; McGarry, 2018). There is a generally-acknowledged need for standardized and culturally-adapted tools, as a way to ease attempts by authorities to monitor urban policies both comparatively and longitudinally. Monitoring the progress of the age-friendliness within the different domains given by the WHO (2007a, 2007b) is an essential aspect of the age-friendly movement and the 5-year Cycle of Continuous Improvement. Consequently, various methodological approaches have been developed in recent years to test the age-friendliness of different cities from the perspective of the citizens (Buckner et al., 2018, 2019; van Hoof et al., 2021, 2022; Dikken et al., 2020). Some of those methodologies used qualitative inquiry, such as individual interviews (Buffel et al., 2020; Luciano et al., 2020), focus groups (Plouffe & Kalache, 2010; Woo et al., 2013), ethnographic research (Tingle, 2021; Toohey et al., 2018). Other studies have used participatory action research (Almeida, 2016), for example, using the photo voice technique (Huisman & Mysyuk, 2020; Novek & Menec, 2014; Ronzi et al., 2020; van Hoof et al., 2020). Such studies are valuable but difficult to replicate and to conduct in comparative intercultural contexts. The need for some quantitative measures was evident (Garner & Holland, 2020). As Dikken et al. (2020) noted, quantitative studies using standardized questionnaires generally lack information about the development and the validation process, including the construct validation and how they cover the eight dimensions as defined by the WHO, thus limiting the potential of reproducibility (Torku et al., 2021; Özer et al., 2022). Besides the methodological shortcomings, there is a clear need for tools that are easy to use to collect data from a longitudinal perspective, so that we record the progress and efficiency of the local initiatives, as well as tools that would allow a comparative perspective between different cities and communities (Rémillard-Boilard et al., 2021). When thinking of standardized instruments to monitor the age-friendliness of different cities, the current literature identifies at least two important challenges.

First, creating a standardized tool would require transparency about the validation process in different countries, and studies conducted up to now are localized, and multi-city comparison is rather absent. The translation and the adaptation, as well as the validation of a standardized tool in different countries, require concertized efforts from different cities to follow the same research protocol in translation, data collection, and the validation process.

Second, the cross-cultural validation of a standardized tool might be very useful for countries that are lagging behind in the implemention of the age-friendly agenda, having none or only a few cities members of the *Global Network of Age-friendly Cities and Communities*, or under the process of evaluation. The main challenge remains the translation and adaptation of such instruments for different languages and cultures, including the peripheral languages. Having a valid standardized instrument which is culturally sensitive and can be used around the globe to assess the age-friendliness of various urban communities is a way of creating awareness of the importance of the age-friendly agenda and bridging urban communities from countries with different city policies.

The current study presents the process of adaptation and validation for the Romanian older population of a standardized tool to evaluate the age-friendliness of the urban communities they are living in. Furthermore, results are presented using a discrete number of age-friendly clusters, which is helpful for policymakers as results are presented understandably. The research is part of a larger project, aiming to translate and adapt the Age-Friendly Cities and Communities Questionnaire (AFCCQ) which was developed by Dikken et al. (2020). This particular tool has been constructed to be used comparatively, with a transparent methodology, thus allowing cross-cultural validation.

2. Method and validation procedure

The current study presents the validation process of the AFCCQ (Dikken et al., 2020) for use in Romania among the older population. In addition, the use of the validated instrument allows us to get insights into older people's views on life in the city where they live and distinguish some typologies of older adults that might experience the life in the city differently. Note that none of the cities in Romania are members of the *Global Network of Age-friendly Cities and Communities* and the current instrument validation is one important step for the urban communities in Romania to design and evaluate policies in line with the age-friendly city agenda. A Romanian version of the AFCCQ (AFCCQ-RO) could be used for the assessment of progress of local policies from a bottom-up perspective.

The original instrument, the AFCCQ, is a 23-item questionnaire covering the eight domains of the WHO's age-friendly cities framework and an additional domain of older people's financial situation. The AFCCQ allows older people to rate various aspects of the city, on a 5-point Likert scale, by thinking of their current situation in their household and in the neighborhood in which they live. This study follows a rigorous procedure using the criteria stated by the *COnsensus-based Standards for the selection of health Measurement INstruments* (Mokkink et al., 2010). The development of the AFCCQ-RO consisted of three phases: Phase 1 – translation of the instrument towards the Romanian language; Phase 2 - face- and content validation for language and culture; and Phase 3 - psychometric validation (Fig. 1).

In the next sections, we present a detailed picture of the setting in the current research, Bucharest municipality – as we expect differences in older people's perception of different dimensions of the city's age-friendliness, according to the sectors and neighborhoods they are living in. We also present the steps of the validation process of the AFCCQ for older adults living in Bucharest followed by presenting the main findings appealing to the context of the six districts presented here.

2.1. Profile of Bucharest

This study was conducted in Bucharest (Romanian: *București*), the capital city of Romania and the largest city in the country. Bucharest has a population of 1,716,983 inhabitants, according to the recent 2021 census (Romanian National Institute of Statistics, INS, 2023), spread over a surface area of 237.9 km^2, with a population density of 7218 inhabitants/km^2. The median age of the population is 44 years. There are 333,088 people aged 65 years and above living in Bucharest, which is 19.4% of the total population. This percentage is similar to the percentage of the older population (65+) in Romania (19.6%). In fact, the aging process in the municipality of Bucharest follows the same trends as the Romanian average, with a 3.5% increase in the aging population from 2011 to 2021 (World Bank, 2023).

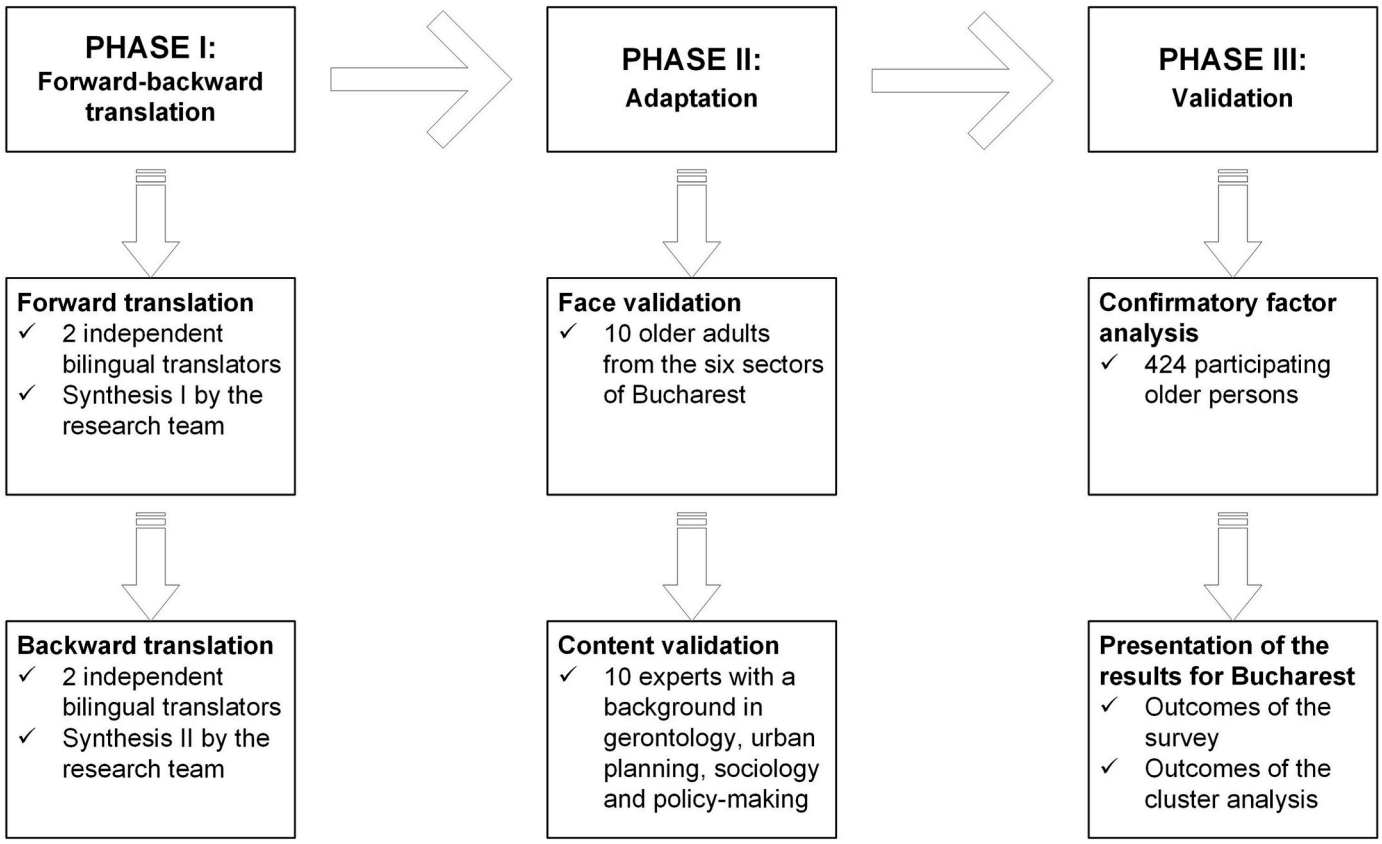


Fig. 1. Phases of the psychometrical validation for the AFCCQ-RO.

Compared to the general population of Romania (19,053,815 million inhabitants, 51,5% females), the percentage of females aged 65 years and over outnumbers the percentage of males, due to the differences in life expectancies between the sexes (an average of 73.3 years; 76.7 years for females; 69.5 years for males). More than one-third of the older population in Bucharest is 65–69 years of age, and the percentage of older women is significantly larger compared to the percentage of men (Table 1). The differences between the number of men and the number of women are more than twice as large for the population aged 85 years and over, who account for approximately 10% of the total population.

Besides the fact that Romania and Bucharest are facing a significant increase in the share of older people in the population, people aged 85 years and over (also called the oldest-old) form a segment of the population that showed an exponential increase during the past ten years, from approximately 2% in the previous population census (Romanian National Institute of Statistics INS, 2011) to almost 10% in 2021. As Table 1 shows, a large percentage of the oldest-old population is made up of women. The majority of the older adults live in independent dwellings (95%), and many are the owners of their own homes, as Romania is the country with the highest percentage (over 95%) of people living in a household owning their home (Eurostat, 2021) Also, the older population in Bucharest is relatively homogeneous in terms of ethnicity (more than 83% of the total population in Romanian are ethnic Romanians, Romanian National Institute of Statistics INS, 2023). A recent study conducted by one of the largest non-governmental organizations targeting the needs of older adults (Niciodata Singuri/Never Alone, 2021) showed that people of 65+ living in urban areas (including Bucharest) experience high levels of loneliness: one-fourth of older adults have declared they very often feel lonely and approximately 60% of them are involving only in household activities, like cooking or cleaning. Almost one-third of the interviewed population in urban areas declared they had interacted with a maximum of four persons in the previous month, and three out of ten respondents thought they had nobody to rely on in case of need. Although the data are presented for the entire older population living in urban communities in Romania, there is no reason to believe that the situation is much different in Bucharest.

Table 1
Distribution of the older population in Bucharest per age group and sex (Romanian National Institute of Statistics INS, 2023; based on the Population Census, 2021).

	65-69 (%)	70-74 (%)	75-79 (%)	80-84 (%)	85+ (%)	Total
Total	33.90	26.57	16,52	13.16	9.85	333,088
Males	43.97	41.67	38.62	34.48	31.37	126,648
Females	56.03	58.33	61.38	65. 52	68.63	206,440

The municipality of Bucharest has six districts, called Sectors (from Sector 1 to Sector 6), and these districts have a separate political and administrative organization, each with a different mayor and a Local Council that administrates district life, from businesses to schools, parks, cleaning services and streets. Bucharest's current organization in six sectors dates from the communist regime (from 1979, Decree no. 284/1979 – see Marin & Chelcea, 2018); and sectors have been designed to maintain a balance between the residential and the recreational areas (Fig. 2). An in-depth profile of the city has been published by Turnock (1990) as well as Nae and Turnock (2011). Bucharest used to have a relatively homogeneous population in terms of ethnic background during the communist regime, with migration being a rather recent phenomenon that accompanied the country's economic development and the integration process into the European Union in 2007. As a result, the older population (people aged 65 years and over) is not characterized by ethnic heterogeneity.

Bucharest has one of the highest population densities among capital cities in Europe, and some areas (such as Sector 6) have a much greater

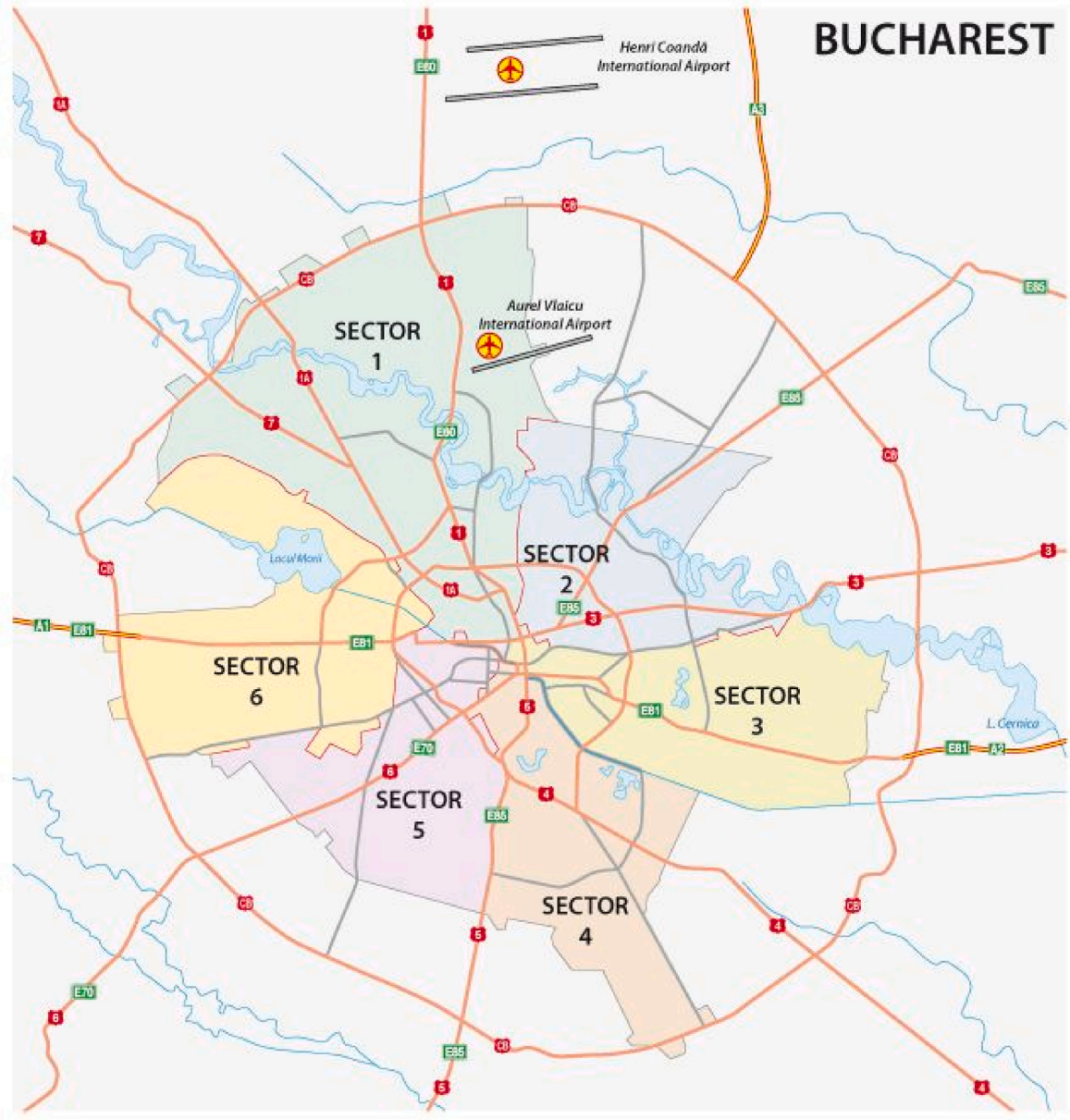


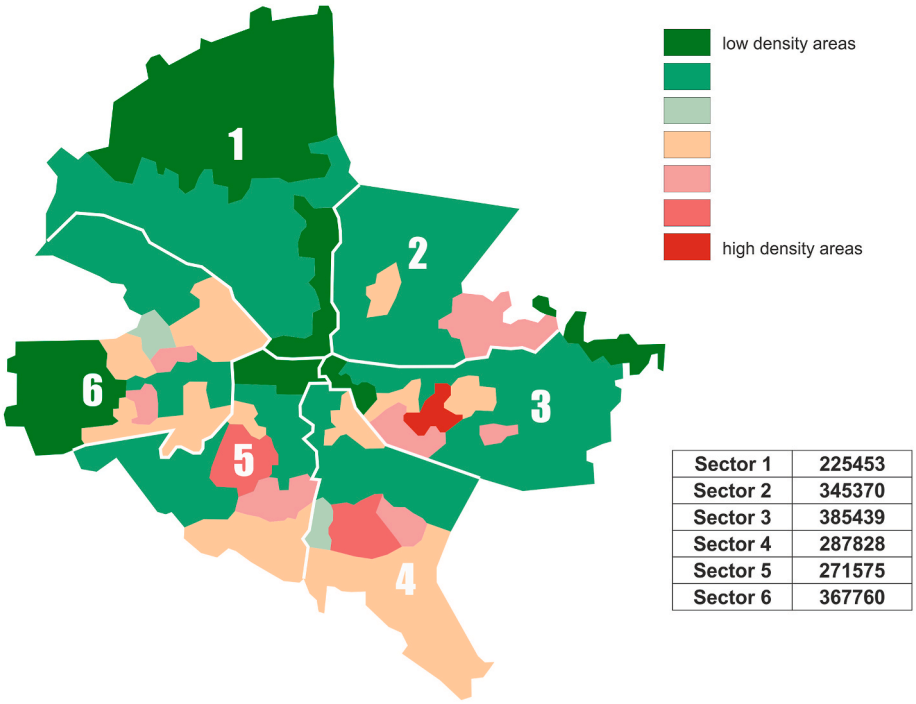
Fig. 2. Administrative and political map of Bucharest. Source: Shutterstock stock vector-ID: 552999718.

density compared to other sectors/areas, making people feel "rather cramped" (Marin & Chelcea, 2018, p. 184). Also, Bucharest has fewer green areas and fewer collective consumption facilities than other capital cities in Eastern Europe. The initial distribution of different neighborhoods gravitated around the large industrial areas. After the collapse of the communist regime in 1989, the densification of Bucharest continued (Nae & Turnock, 2011). Like many other capital cities in Eastern Europe, there was a little preoccupation with urban planning and regulation. The urban land became the subject of housing estate speculations to result in maximum profit. In addition, the restitution legislation allowed the original owners of different urban spaces and buildings to call for the reinstallation of their private rights. The law itself allowed for various re-interpretations, and neighborhoods' open spaces became subject to privatization, eventually leading to new construction houses and pressuring more on outdoor spaces and buildings for collective use (for example the community centers and various service-providing institutions – see Marin and Chelcea (2018) for an overview).

Currently, the six sectors of Bucharest are slightly different in term of population and density (Fig. 3). The larger and denser districts are Sector 3 and Sector 6, whereas Sector 1 is the less dense and have the lowest number of inhabitants. In the Sector 5, one could find areas with a very dense population – the same areas known for poverty and social disparities (mainly Rahova and Ferentari – colored in purple in Fig. 2).

The municipality of Bucharest acknowledges the economic disparities between the sectors, especially between the northern (Sector 1 and Sector 2) and the southern areas (Sectors 4, Sector 5). The differences between the six sectors can be partially explained by the differences in economic resources and productivity. Sector 1 and Sector 2 hold the largest concentration of people active in the labor market and the highest concentration of companies, as opposed to Sector 4 and Sector 5. As a result, companies in Sector 1, for example, are estimated to produce seven times more revenues than the two sectors from the south of Bucharest. Consequently, we expect such disparities in the economic development of different areas of Bucharest to be reflected in the ways older adults from different sectors perceive the age-friendliness of their city.

Interestingly, the six sectors and areas within the sectors are different



Sector 1	225453
Sector 2	345370
Sector 3	385439
Sector 4	287828
Sector 5	271575
Sector 6	367760

Fig. 3. Total population of the 6 sectors of Bucharest and the density of different areas in each sector, based on data from *Worldometers* (2023) and the Municipality of Bucharest (2019).

in respect of the percentages of the older population (Fig. 4). Large segments of the older population tend to be concentrated in Sector 1, whereas Sector 3, Sector 4, Sector 5, and Sector 6 tend to concentrate more the younger population of Bucharest. Some of the neighborhoods in Sector 6 and Sector 4 are not only areas where we find a lower percentage of older adults, but also more newly-constructed neighborhoods, with a large concentration of families and children.

2.2. Forward and backward translation

The translation procedure for the AFCCQ-RO was based on Sousa and Rojjanasrirat (2011). The AFCCQ-EN (British-English version of the AFCCQ) was forward-translated into Romanian by two independent translators, who were fluent in both English and Romanian. Translator 1, with expertise in Romanian gerontology, urban planning, and policy terminology, and Translator 2, familiar with colloquial phrases, jargon, and idiomatic expressions, worked on capturing the socio-cultural nuances. The forward-translated versions of the AFCCQ-RO were

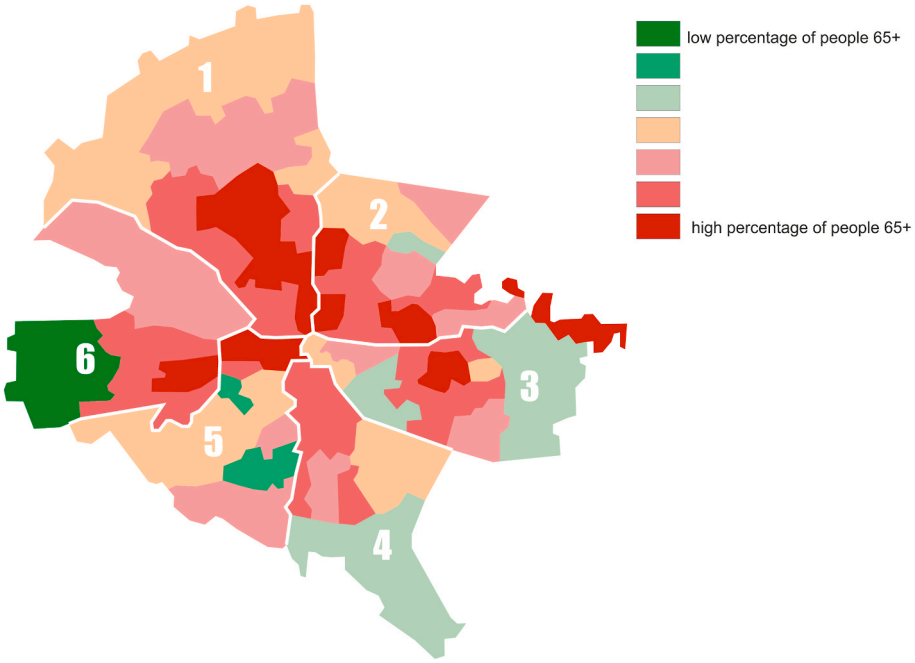


Fig. 4. The concentration of the older population (65+) in different areas of Bucharest, based on data from the Municipality of Bucharest (2019).

compared to the AFCCQ-EN, and any ambiguities or discrepancies were discussed and resolved by the research team. Subsequently, the AFCCQ-RO was back-translated into British English by two other independent translators, who produced back-translated versions without any prior knowledge of the AFCCQ-EN. The research team compared the instructions, items, and response templates of the back-translations to ensure accuracy. This rigorous translation process established conceptual, semantic, and content equivalence for the AFCCQ-RO.

2.3. Qualitative validation

To assess the content validity of the AFCCQ-RO, a panel of ten experts in gerontology, urban planning, sociological research, and public policies relevant to the age-friendly agenda participated in the study. They independently rated the relevance of each item on a four-point Likert scale, considering the construct, the studied population, and the study's purpose. The comprehensiveness of the instrument was evaluated by assessing whether the items covered the entire construct. Additionally, to assess face validity, ten older adults from different socio-economic backgrounds, representing each of the six sectors of Bucharest, were invited to evaluate the relevance of the AFCCQ-RO items specifically for their assessment of the livability of Bucharest. They also rated the questionnaire items on a four-point Likert scale. For both face and content validity, the Item Content Validity Index (I-CVI) was used, considering ratings of 3 or 4 as relevant (Dikken et al., 2020; Lak et al., 2019; Lynn, 1986; Polit, Beck, & Owen, 2007). I-CVI was calculated by the number of experts who rated the item as relevant (3 or 4) divided by the total number of experts. Items with an I-CVI above 0.78 were considered valid, while those below 0.69 were excluded. Items on the threshold (0.70–0.89) were assessed by the research team and either included or excluded based on consensus. The readability was evaluated on a ten-point Likert scale, with items receiving a mean score of <6 being reviewed and modified if necessary. Finally, the Scale Content Validity Index/Ave (Average of the I-CVI values across all items) above 0.90 was considered excellent. SPSS version 29.0 was used for data analysis (IBM Corp, 2021).

2.4. Psychometric validation

This phase aimed to statistically assess the construct validity of the AFCCQ-RO, using a confirmatory factor analysis (CFA) process. By using a CFA, researchers explicitly test the hypotheses about which items measure which latent factors, and provide more robust validity evidence of the fit of the tested model with the data (i.e., that a scale accurately measures what it purports).

2.4.1. Data collection and participants

For the data collection phase, a sample of community-dwelling older people (65 years and over) were recruited (Table 2). Using a local company that conducted face-to-face interviews, data were collected using a representative sample (for age, sex, and the district) of 424 respondents (NI = 95, margin of error = ± 5%), all 65 years and above, living in Bucharest, in the six districts of Bucharest described above. Selection criteria follow the structure of Bucharest population in three age groups: 60–69; 70–74; and 75+ and on sex within each group and comparative subsamples were created for each of the six districts. Data were collected in September–October 2022, using field operators, and people were asked to answer voluntarily to the AFCCQ-RO questionnaire. We also recorded socio-demographic aspects as listed in Table 1. Participants were warranted anonymity, and data were stored in compliance with the General Data Protection Regulation in Romania. Participants expressed their verbal agreement to participate in this study, no other socio-demographics were collected, except from the ones listed in Table 1, and each participant was free to stop the questionnaire at any moment. All 424 questionnaires were completed, and the dropout rate was below 10% of the approached participants. The current study complies with the academic regulations on research involving participants using questionnaires and *Certification of Ethical Acceptability for Research Involving Human Subjects* was obtained from the Ethic Committee at the National University of Political Studies and Public Administration (SNSPA) on May 23, 2022, before the starting process of the translation and the validation. Consistent with the data on Bucharest, approximately one-third of our sample is in the age segment of 60–69 years, and the percentage of women is considerably higher than that of men. Also, 100% of our sample consists of ethnic Romanians and more than 85% are home owners.

Table 2
Sample characteristic of the AFCCQ-RO validation process (n = 424).

Sex	
Men	166 (39.2%)
Women	258 (60.8%)
Age	
Mean (SD)	73.5 (7.0)
65–69	148 (34.9%)
70–74	110 (25.9%)
75+	166 (39.2%)
Ethnicity[a]	
Romanian	424 (100%)
Educational level	
ISCED 0-2	31 (7.3%)
ISCED 3-4	148 (34.9%)
ISCED 5-6	108 (25.5%)
ISCED 7-8	137 (32.3%)
Type of dwelling	
Home-owners	350 (82.5%)
Social housing	5 (1.2%)
Private rent	69 (16.3%)
Living with somebody (family member or other)	306 (72.2%)
Receiving care	129 (30.4%)
Living with one or more chronic conditions	164 (38.7%)
Using a wheeled walker, a wheelchair, or something to support walking	181 (42.7%)

[a] Note that 98% of the population in Bucharest declared they are "Romanian" in the recent 2021 Population Census (Romanian National Institute of Statistics INS, 2023). Data for people aged 65 years and above are similar to the general population of Bucharest.

2.4.2. Confirmatory factor analysis

The CFA was conducted to test the factor structure proposed by Dikken et al. (2020) using the data from the Bucharest sample. The model allowed for factors to co-vary, similar to the Promax rotation in EFA. Several fit indices were used to assess the model fit. The normed χ^2 was considered, with values below 2 generally preferred (Shadfar & Malekmohammadi, 2013), while some researchers tolerate values up to 5 (Schumacker & Lomax, 2004). The robust Comparative Fit Index (CFI) and Tucker Lewis Index (TLI) were evaluated, aiming for values of 0.9 or greater (Hu & Bentler, 1995). The root-mean-squared residual (SRMR) should be less than 0.08 (Hu & Bentler, 1999), and the root-mean-square error of approximation (RMSEA) was assessed, with values below 0.08 indicating a moderate fit (MacCallum et al., 1996). The internal consistency of the final model was examined using composite reliability, with a value of 0.70 considered appropriate (Hair et al., 2014).

2.5. Cluster analysis

In order to determine the number of clusters and to group similar study participants (i.e., to develop age-friendly typologies (clusters) in line with the methodology by Bennetts et al. (2020) and van Hoof, van Staalduinen, and Dikken (2023), the nine domains of the AFCCQ were used as input for a cluster analysis (Bratchell, 1989). After every participant was grouped into a cluster with other respondents with matching AFCCQ responses, their socio-economic data were examined on a cluster level to determine socio-demographic details within and between clusters.

Hierarchical cluster analysis (HCA) with Ward's method was utilized to determine the optimal number of clusters and assess association and similarity (Blashfield, 1976; Hands and Everitt, 1987; Ward, 1963). In order to validate the cluster number, the study sample was randomly split in half, and cluster analysis was repeated. Once the most stable number of clusters was identified, *k*-means cluster analysis was performed to provide further clarification and interpretation. Demographic characteristics within each cluster were examined to identify notable features, with categories representing 75–99% considered "highly likely" for a particular cluster, and categories between 51 and 74% deemed "likely." Categories below 50% indicated either a lack of salience for that feature or, if applicable, were combined. All analyses were conducted using SPSS version 29.0 (IBM Corp, 2021).

3. Results

3.1. Translation and validation

The initial translation of the AFCCQ from British English to Romanian was performed accurately. Minor adjustments were made by the main researcher to ensure consistent language use in the final versions (for example, in adding the word "area/*zonă*" when people have to describe different aspects of the urban facilities – see Q1 of the AFCCQ-RO in Appendix 1). The back translation closely resembled the original items, although there were a few instances where the translation was not an exact match or looser translations were used. After consensus was reached, no further changes were deemed necessary for the final version of the back translation. The complete AFCCQ-RO can be found in Appendix 1.

For the face and content validity, all participants assessed the AFCCQ items relevant (I-CVI above 0.78) for Romanian context and provided no further comments or suggestions for improving item readability. The CFA's model for the original-factor structure of the AFCCQ demonstrated a good fit to the data, as shown in Table 3; the normed χ^2 value was 3.117, indicating an adequate fit. The robust CFI and TLI values were both above 0.90 (0.948 and 0.932, respectively). The RMSEA value was 0.052 which is below 0.80 as described by MacCallum et al. (1996, p. 142). The robust SRMR value was 0.0578, which is below the recommended threshold of 0.08 (Hu & Bentler, 1999). Moreover, all estimated covariance paths between the factors were below the 0.85 cut-off, indicating sufficient discriminant validity and confirming that the items measure distinct yet potentially related factors.

To evaluate the internal consistency of the model derived from the final CFA (Fig. 5), the composite reliability was analyzed (Table 4). The findings reveal that all factors exceed the threshold of >0.70, except for Civic Participation and Employment, which scored 0.657. This might be due to factors specific to how older life is perceived in the Romanian context, for instance, by feeling disconnected from civic and economic participation (Loos et al., 2017).

3.2. Older people's views on bucharest

Older people's views on the age-friendliness of their city were analyzed for the subsamples of the respondents living in each of the six sectors of Bucharest (Table 5). When using the AFFCQ-RO, the domain of housing was rated very positively by older adults. This was particularly the case for people living in Sectors 4 and 5. One possible explanation lies in the large number of people owning their private houses in Romania in general, and in Bucharest in particular (over 95%). The positive perception in the housing domain is higher in less economically rich sectors (Sectors 4 and 5). These are sectors with higher percentages of younger population and many relatively dense areas. Another dimension of the WHO age-friendly city model, which is consistently rated positively by people from districts of Bucharest is Social participation. Although there is no significant difference between people living in different sectors, again people who tend to perceive more positively this area are those from less economically affluent districts. Except for Sector 2, older people tend to be satisfied with the community support and health services in the areas they live in Bucharest. The domain of Respect and social inclusion is the only dimension generally rated negatively by participants, regardless of the district. This seems to be, from the perspective of older adults, a real problem of Bucharest's urban life. Other aspects that need improvements in case local authorities commit to the age-friendly city agenda and aim to become members of the *Global Network of Age-Friendly Cities and Communities* are civic participation and employment of older adults and communication and information. Note that the Communication and information domain was positively rated in only one of the six administrative districts of Bucharest and this is important to know as each district has a different mayor and a different local council, thus a different vision on how to communicate with the citizens.

3.3. Cluster analysis: four typologies of older adults

The cluster analysis led to the identification of four clusters presented in Table 6. Moreover, Table 7 describes a typology of older individuals in each of the four clusters. Our data show each cluster's socio-demographical profile and how the profiles interact with the age-friendly city subjective evaluation. For example, people from Cluster 1 tend to rate the different age-friendly components more negatively. Cluster 1 is largely formed by people 75 years and above, having lower levels of education, chronic health conditions, and mobility problems. People from this cluster struggle more with their financial situation and some of them live in social housing. At the other extreme, we have Cluster 4, mainly formed by men, highly educated and younger, as compared to the other three clusters. Cluster 4 is formed by affluent older adults, 95% of them owning their own houses. They tend to evaluate strongly the respect and social inclusion dimension and they are more positive about the opportunities for civic and employment participation in Bucharest, probably because they not only have the resources but also the skills to stay longer in the labor market. Remarkably, Cluster 4 is formed by people who have a higher chance of living alone (without a partner or somebody from the family), whereas

Table 3
Fit model of data from Bucharest with the original model as described by Dikken et al. (2020).

Model	Normed χ^2	Comparative Fit Index (CFI)	Tucker Lewis Index (TLI)	Root-Mean Squared Residual (SRMR)	Root-Mean Square Error of Approximation (RMSEA)
Model 1.	3.117	0.948	0.932	0.0578	0.052

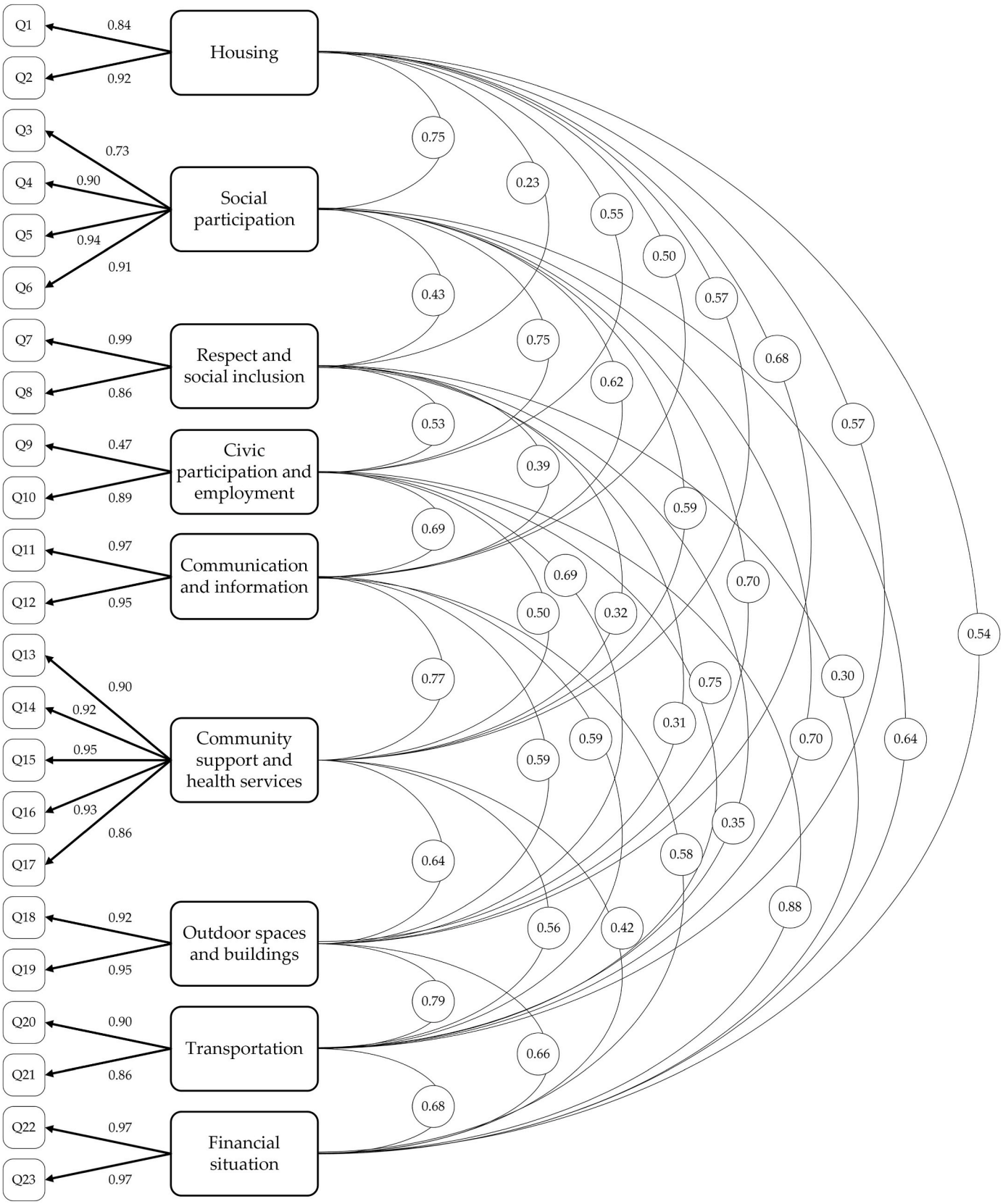


Fig. 5. Model of the confirmatory factor analysis of the AFCCQ-RO.

Table 4
Composite reliability of the 9 domains of the AFCCQ-RO.

Domain	Housing	Social Participation	Respect and Social Inclusion	Civic Participation and Employment	Communication and Information	Community Support and Health Services	Outdoor Spaces and Buildings	Transportation	Financial Situation
Composite Reliability	0.876	0.926	0.923	**0.657**	0.957	0.962	0.935	0.871	0.969

Table 5
Scores (mean and standard deviation) for the AFCCQ-RO for the Municipality of Bucharest and its sectors (n = 424).

	Total	Housing	Social Participation	Respect and social inclusion	Civic participation and employment	Communication and Information	Community support and health services	Outdoor spaces and buildings	Transportation	Financial situation
Bucharest total (N=424)	11.63 (15.37) (++)	1.90 (1.53) (++)	2.93 (3.11) (++)	-0.67 (2.12) (-)	0.83 (1.90) (+)	0.77 (2.15) (+)	3.20 (4.73) (++)	1.20 (1.92) (++)	1.07 (2.10) (+)	0.40 (2.68) (+)
Sector 1 (N1=82)	10.26 (14.71) (+)	2.06 (1.31) (++)	2.67 (3.27) (++)	-.01 (2.17) (-)	0.48 (1.96) (+)	0.44 (2.27) (+)	2.79 (4.86) (++)	1.0 (1.81) (+)	0.60 (2.14) (+)	0.23 (2.58) (+)
Sector 2 (N2=68)	8.29 (14.91) (+)	1.47 (1.67) (++)	2.60 (2.86) (++)	-0.60 (1.98) (-)	0.62 (1.67) (+)	0.24 (2.21) (+)	2.38 (4.45) (+)	0.81 (1.81) (+)	0.87 (1.84) (+)	-0.09 (2.67) (-)
Sector 3 (N3=77)	11.75 (17.67) (++)	1.78 (1.71) (++)	3.01 (3.35) (++)	-0.90 (2.26) (-)	0.77 (2.06) (+)	0.92 (2.25) (+)	3.68 (5.01) (++)	1.31 (2.26) (++)	1.23 (2.41) (++)	-0.05 (3.08) (-)
Sector 4 (N4=71)	16.60 (13.64) (++)	2.15 (1.21) (+++)	3.45 (3.00) (++)	-1.31 (2.02) (- -)	1.34 (1.94) (++)	1.54 (1.68) (++)	4.82 (3.78) (++)	1.80 (1.69) (++)	1.69 (1.76) (++)	1.10 (2.53) (++)
Sector 5 (N5=59)	13.58 (16.01) (++)	2.14 (1.61) (+++)	3.51 (2.82) (++)	-0.78 (2.11) (-)	1.17 (1.97) (++)	0.78 (2.27) (+)	2.73 (5.46) (++)	1.54 (1.88) (++)	1.39 (2.28) (++)	1.10 (2.42) (++)
Sector 6 (N6=67)	9.55 (13.86) (+)	1.80 (1.56) (++)	2.40 (3.16) (++)	-0.52 (1.99) (-)	0.69 (1.61) (+)	0.75 (1.97) (+)	2.70 (4.40) (++)	0.78 (1.82) (+)	0.72 (1.91) (+)	0.24 (2.49) (+)

The colored zones represent how dissatisfied or satisfied older people are regarding the city in general or regarding a specific domain. Scores in green zones mean that people go from neutral (+white) to slightly satisfied (++ light green) to very satisfied (++++, dark green), scores in red mean that people are slightly dissatisfied (-, light red) to very dissatisfied (– - -, dark red), based on the interpretation and presentation method presented by Dikken et al. (2020).

the probability of living together is higher for Cluster 1 and Cluster 2.

4. Discussion

In the context of the WHO's age-friendly cities and communities' movement and the need for standardized and culturally adapted tools to monitor age-friendliness, the current study presents the process of adaptation and validation of the AFCCQ for the older population in Romania. This tool was initially developed by Dikken et al. (2020) and listed by the WHO (2020) as a best practice for the assessment of the perceived age-friendliness of the urban communities, having in mind a bottom-up approach: from the citizens' views to policymakers and local

Table 6
Clusters and cluster scores for the AFCCQ-RO (n = 424).

		Cluster 1 (n=63)	Cluster 2 (n=137)	Cluster 3 (n=155)	Cluster 4 (n=69)	Sign.
Domain		Mean	Mean	Mean	Mean	
Total AFCCQ	True-score	-12.60 (- -)	3.18 (+)	18	34.87 (+++)	<.001
Housing	True-score	0.06 (+)	1.44 (++)	2.30 (++)	3.59 (++++)	<.001
Social participation	True-score	-1.54 (-)	1.82 (++)	3.97 (++)	6.87 (++++)	<.001
Respect and social inclusion	True-score	-0.25 (-)	0.19 (+)	-0.92 (-)	-2.20 (- - -)	<.001
Civic participation and employment	True-score	-1.25 (- -)	-0.12 (-)	1.46 (++)	3.16 (++++)	<.001
Communication and information	True-score	-1.86 (- -)	-0.31 (-)	1.60 (++)	3.46 (++++)	<.001
Community support and health services	True-score	-2.56 (- -)	0.63 (+)	5.14 (+++)	9.23 (++++)	<.001
Outdoor spaces and buildings	True-score	-1.13 (- -)	0.24 (+)	1.89 (++)	3.68 (++++)	<.001
Transportation	True-score	-1.62 (- -)	0.26 (+)	1.74 (++)	3.64 (++++)	<.001
Financial Situation	True-score	-2.46 (- - -)	-0.97 (-)	1.41 (++)	3.43 (++++)	<.001

Table 7
The four age-friendly typologies based on socio-demographic data.

	Cluster 1 (n = 63)	Cluster 2 (n = 137)	Cluster 3 (n = 155)	Cluster 4 (n = 69)
Personal factors	75.4 ± 7.1 years old, living in Bucharest for 48.8 ± 20.0 years. 44.4% is 75 years and over. Likely to be **female*** (69.8%). All people in the cluster were born in the Romania (100%)	74.1 ± 6.3 years old, living in Bucharest for 48.6 ± 19.6 years. About half are 75 years and over (48.2%). Likely to be **female*** (70.8%). All people in the cluster were born in the Romania (100%)	72.4 ± 6.7 years old, living in Bucharest for a long time (mean 51.4 ± 24 years). About half are 75 years and over. Likely to be female (54.2%). All people in the cluster were born in the Romania (100%)	72.9 ± 8.4 years old, living in Bucharest for a long time (mean 52.3 ± 23 years). An equal ratio over the age cohorts. Likely to be male. All people in the cluster were born in the Romania (100%)
Education level	Likely to have completed a lower level of education** (ISCED 0–4) (61.9%)	Education is well distributed in the cluster	Likely to have completed a higher level of education ** (ISCED 5–8) (62.6%)	Likely to have completed a higher level of education ** (ISCED 5–8) (66.7%)
Housing situation	People are likely to be **owner-occupants*** (65.1%) of people who rented, 3.2% lived in social housing and 31.7% lived in private houses. Highly likely to live with partner (87.3%)	People are highly likely to be owner-occupants* (77.4%) and 22.6% lived in private houses. Highly likely to live with a partner (84.7%).	People are highly likely to be owner-occupants* (89.0%) and 9.0% lived in private houses and 1.9% in social housing. Likely to live with partner (64.5%)	People are highly likely to be owner-occupants* (94.2%) and only 5.8% lived in private houses. Equal ratio of living alone or with a partner.
Health	Of this group, 42.9% of people mentioned **having a chronic condition***, 27% **received some sort of healthcare** and 20.6% used a **mobility aid.**	Of this group, 40.9% of people mentioned **having a chronic condition***, 21.2% **received some sort of healthcare** and 21.9% used a **mobility aid.**	Rather healthy. Of this group, 35.5% of people mentioned **having a chronic condition***, 33.5% **received some sort of healthcare** and 63.9% used a **mobility aid.**	Of this group, 37.7% of people mentioned **having a chronic condition***, 44.9% **received some sort of healthcare** and 56.5%% used a **mobility aid.**
Quality of life	Mean score QoL 4.27 ± 2.92	Mean score QoL 5.62 ± 2.94	Mean score QoL 8.05 ± 2.37	Mean score QoL 9.07 ± 1.47
AFCCQ domain of interest	Low score for Civic participation and employment; Dissatisfied with Communication and information; Dissatisfied with Community support and health services; Poor financial situation	Dissatisfied with Civic participation and employment; Dissatisfied with Communication and information; Unstable financial situation	Respect and social inclusion is an issue; Good score for Community support and health services; Stable financial situation	Respect and social inclusion is an issue; Good score for Community support and health services; High score for Social participation; Good financial situation

** Highly likely >75%, *Likely 51–74%, no salience <50%.

authorities. The current work presents the phase of the validation of the AFCCQ-RO (translation, face and content psychometrical validation) using data of the older population from Bucharest, following a sampling procedure that includes the main socio-demographics and people from different districts of the Romanian capital city. The new AFCCQ-RO had sufficient discriminant validity and proved to be a robust tool that could be used in Romania, in any city aiming to become "age-friendly". Although none of the urban communities in Romania are yet members of the *Global Network for Age-Friendly Cities and Communities*, the AFCCQ-RO could be as well used in the Republic of Moldova. This is a Romanian-speaking country, which has five communities being a member of the network.

Data collected using the AFCCQ-RO allowed us to distinguish between four clusters of older adults, who experience different life in the city, regardless of the areas in which they live. The four clusters are the expression of the polarization of old age in the city of Bucharest, similar to what was found in other cities (such as in The Hague in the study conducted by Dikken et al., 2020; van Hoof et al., 2022; van Hoof et al., 2023) – and reiterate the discussion between socio-economic inequalities later in life. In addition, our data enrich the discussion regarding ageing in place in urban environments (Buffel & Phillipson, 2023), as cities are imagined as administrative structures with a high percentage of working-aged people, and as in many cities older adults are rarely incorporated in the mainstream planning of urban environments. The description of the four clusters that emerged from our data, shows that older adults are a heterogeneous group of urban citizens with different needs and expectations from their city life.

Cluster 1 consisted of people who were representatives of the fourth agers (75 years and over) with lower socio-economic status, deeply concerned about their financial situation, and with vulnerable health conditions. They tend to rate negatively all aspects of urban life, in contrast with Cluster 4 – the group of affluent older adults who enjoy their older age in the urban community. By presenting the four clusters, we underline the fact that age-friendly city concept lies at the intersection between urban policies and people's views on their situation, and the more "age-friendly" urban communities should be the ones that allow fewer differences between such clusters. Also, our data show that city life is the place of multiple social and economic contradictions (Zhuang & Ye, 2023). There is an urge for rethinking urban communities in the context of the accelerating aging process in many cities around the globe (Zhang, Li, & Chan, 2020). The AFCCQ is a tool through which one can gather older people's perspectives, which could be further used to reshape the co-governance and co-design of the urban policies in different cities, starting from the views of older adults from different socio-economic groups (i.e., the identified clusters).

Based on the study results, we will further highlight the importance of the AFCCQ tool in shaping urban policies.

First, older people from Bucharest had a relatively positive view of the housing domain, consistent with the current data showing Romania (and Bucharest is not an exception) as a country with the highest level of private home-ownership in the European Union (over 95 %- see Eurostat, 2021). The current scores are relating to the accessible of homes, and not on aspects such as other types of home modifications, intergenerational and group living (Kazak, 2023; Kazak et al., 2017; Tavy et al., 2022). Although the housing domain is generally rated positively by the older citizens of Bucharest, residents of some districts are more satisfied than others. We found the positive ratings occurred particularly in two districts of Bucharest with dense population, having a high percentage of young adults. We could only speculate about such findings. As each district of Bucharest is a distinctive administrative and political unit, implementing many local policy measures in a specific way, one possible explanation lies in the differences between housing policy measures of each district. An additional explanation is related to the fact that areas of the city with large segments of the young population have attracted, over the year, more interest from the authorities and more focus on housing-related policies.

Second, *civic participation and employment* and the *communication and information* dimensions have got a relatively neutral appreciation from the old citizens of Bucharest. It might be that old people value less these aspects of urban life when thinking about the quality of the urban environment (see for example Sun et al. (2017) for a similar perspective). Still, people from only one district of Bucharest (Sector 4) have appreciated the communication and information aspect of their urban life in a positive way. Such a situation shows the important role of

AFCCQ in shaping further policies, at the local, de-centralized level. We could further analyze (using content analysis and possible interviews with the authorities) what are the recent measures in Sector 4 regarding the communication and information process and how the citizens of this district, particularly older people, are involved in the decision process, what is the information flow, and how authorities communicate different issues of general interest. We believe that AFCCQ becomes particularly relevant when only people from a certain district/neighborhood rate some dimensions of the age-friendly city's model positively or negatively, in contrast with other districts/neighborhoods. In such cases, the results gathered through AFCCQ could indicate the successful or unsuccessful effects of certain policies and offer important feedback for policymakers.

Nevertheless, using the AFCCQ in different countries and comparatively could reveal some country specificity. Compared with the Netherlands, where the AFCCQ has been first used (Dikken et al., 2020; van Hoof et al., 2022) - one of the eight dimensions of the age-friendly concept has been particularly salient in the data gathered in Bucharest. Older adults, regardless of their socio-demographics and district in which they live, have rated the domain of *respect and social inclusion* negatively. In other words, older adults, at least from Bucharest, feel disrespected and socially excluded from urban life. This is an important finding, which is in line with findings from other studies we have conducted in Romania by interviewing older adults (Ivan & Nimrod, 2021; Schiau et al., 2018) and deserves further investigation. The use of AFCCQ indicates that respect and social inclusion of older people is an important issue in Bucharest (and possibly in other cities of Romania) and needs to be addressed in future urban policies. Still, the main limitation of a standardized instrument, such as AFCCQ, is the fact that does not convey meanings and we could not reveal in which way people felt they were disrespected and excluded, and what they meant by that. Consequently, the use of AFCCQ should be accompanied by qualitative tools to understand some of the issues derived from the data. Similar to other studies (Greenfield & Reyes, 2022; Scharlach & Lehning, 2013) our research discusses the link between age-friendly communities and social inclusion, providing a description of four clusters of older adults with different evaluations of the city life. The four clusters differ from one another through socio-economic resources and health status, indicating the need for programs and policies with the potential to reduce the disparities between different communities of older adults and to promote the social inclusion.

Third, our study provides insights into the typologies of age-friendly subjective evaluations and allows us to identify four clusters, based on socio-demographics, with distinct evaluations of the quality of life in the urban community. The four clusters are distinctive, especially in terms of socioeconomic status and health conditions. The contrast between Cluster 1 (people with a poor socio-economic status and living with chronic medical conditions) and Cluster 4 (people with a good financial condition and a better health situation) shows the fact that older people's visions of the quality of city life are not only dependent on local urban policies, but on their needs and expectations. In Romania, and not only, old age is accompanied by large discrepancies between those with good socio-economic conditions – who benefit more from life in good neighborhoods, and can afford private health services and other opportunities offered by the city, and those in poor socio-economic conditions who struggle more with their financial situation, are more dissatisfied with the health services and generally speaking with each of the eight domains described by the age-friendly city concept. By identifying such clusters whenever the AFCCQ is used, urban policymakers could direct more action plans to those in need. After all, urban communities are often divided in terms of lifestyle, expectations, and opportunities and urban policy plans could work to diminish the socio-economic dive of older adults living in those communities. By looking not only at the opinions of the affluent groups of older people (as is the case of Cluster 4 in the current research) but to the city evaluations of the less privileged, policymakers could evaluate and target better future urban policies.

5. Conclusions

Urban policies cantered on the age-friendly agenda need methodological approaches to evaluate the age-friendliness of different urban communities. Current work presents the cultural adaptation of an already existing standardized tool, the AFCCQ, for the Romanian older population. The instrument proved to be robust and fit the initial model of eight dimensions suggested by the WHO in the operationalization of the concept age-friendly city. Our work shows the way AFCCQ could be used to highlight different typologies of older adults in the city (clusters) and how they experience the life in the city differently. We suggest here that older people's views of the city in which they live are reflections of the public policies of the municipality (at large or on the district level) and of their own socio-economic and health situation. Further developments should include additional qualitative tools to complement the AFCCQ. A comparative analysis of how this instrument works in different cultural contexts could further contribute to the evaluation of urban policies.

Author contributions

Loredana Ivan was responsible for the Conceptualization; Data curation; Formal analysis; Funding acquisition; Investigation; Methodology; Project administration; Validation; Visualization; Writing - original draft.

Jeroen Dikken was responsible for the Conceptualization; Formal analysis; Funding acquisition; Methodology; Resources; Validation; Writing - original draft.

Joost van Hoof was responsible for the Conceptualization; Funding acquisition; Methodology; Project administration; Supervision; Visualization; Writing - review & editing.

All authors saw and approved the final version and no other person made a substantial contribution to the paper.

Declaration of competing interest

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Appendix A. Supplementary data

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