DOI: 10.1590/1413-81232018244.08902017

Age-friendly Coimbra city, Portugal, perception and quality of life in a sample of elderly persons

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Abstract *The "Age-Friendly Cities" project was developed by the World Health Organization to address two contemporary issues of increasing relevance: urbanization and demographic ageing. The Checklist of Essential Features of Age-Friendly Cities that stemmed from this project is a tool designed for a city's self-assessment, comprising eight dimensions of urban living associated with active ageing. This study aims to adapt the Checklist as a quantitative assessment tool, evaluate the level of Coimbra's "Age-Friendliness" and analyze the relation between the Checklists' eight dimensions and quality of life (QoL). A personal data questionnaire, the adapted Checklist and WHOQOL-Bref were applied to a non-probabilistic sample of 215 elderly Coimbra dwellers aged between 60 and 90 years old. The adapted Checklist evidenced good psychometric properties, although it was perceived by the respondents as difficult to complete. "Community and Health Services" and "Social Participation" obtained the highest satisfaction rates; "Housing" and "Civic Participation and Employment" the lowest; "Community and Health Services" and "Housing" had the strongest correlations with QoL, flagging important areas of improvement.*

Key words *Coimbra, Quality of life, Age-friendly city, Active ageing*

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Introduction

The need to consider the linkages between populations and their surrounding environment in a socio-ecological approach to health, an essential component of quality of life, was referenced in the Ottawa Charter. This document stemmed from the First International Conference on Health Promotion, held in November 1986, as a response to general expectations for new health policies that consider the challenges of contemporary societies. According to the World Health Organization (WHO)[1], the twenty-first century is marked by two global trends: urbanization and ageing population. In Portugal, the National Statistical Institute[2] estimated a decreased working-age population (340 to 149 people for every 100 elderly persons) and increased elderly (131 to 307 for every 100 young people) for the period 2012-2060. Thus, cities must develop and adopt measures for the promotion of active ageing of the whole population. Similarly, quality of life is an increasingly relevant topic in planning and management policies of the territory, particularly in cities[3].

There is yet no consensus on the definitions of both "active ageing"[4,5] and "quality of life"[6,7]. In this study, we adopted the WHO definition of active ageing[8] as a continuous process of optimizing conditions that contribute to health, participation and safety in the final stages of the life cycle, in order to improve people's quality of life as they grow older. Quality of life was defined by the WHOQOL Group[9] as an "individuals' own perception of their position in life, within their own context of culture and value system and in relation to their goals, expectations, standards and concerns".

The *Age Friendly Cities* project

Considering the ageing population phenomenon and recognizing the multiple connections between environment and active ageing, the WHO promoted the *Age-Friendly Cities* project. Initially implemented in 33 cities across 22 countries[1], this study sought to assess the needs of the elderly in different communities and to change city aspects based on the collected data. The research followed a qualitative research protocol with *focus groups* called the Vancouver Protocol[10]. The topics assessed, indicated in the Instruments section of this paper, were previously defined based on the concept of active ageing and identified by age-friendly model communities[11]. The project resulted in the *Global Age-Friendly Cities: A guide*[1] and the *Checklist of Essential Features of Age-Friendly Cities*[12], which were translated into different languages. In Portugal they were translated and published by the Calouste Gulbenkian Foundation in 2009. However, the Portuguese translation of the central concept – *Cidade Amiga dos Idosos*, that can be roughly translated as "Elderly-Friendly City" – seems to focus on the older population, even though it's original intent was to highlight the promotion of active aging as a process that covers the entire life span[11], benefiting children, youth and adults alike. Indeed, instead of *Elderly-Friendly City,* the literal translation to "Cidade Amiga da(s) Idade(s)" ("Age-Friendly City") would possibly convey more appropriately the benefits that all age groups could receive from its implementation.

Using the concept of Age-Friendly City as a theoretical grid, studies were carried out in Portugal at a national level, with the *cIdades* project[13], and at a local level in Viana do Castelo[14], Porto[15] and Aveiro[16]. These included different methodological approaches: focus group[15,16] or a dichotomous questionnaire (availability/lack of attributes in the city) adapted from the Checklist of Essential Features of Age-Friendly Cities (*CEFAFC*)[13]. None of these studies encompassed the relationships between city features and other relevant variables, such as quality of life.

This study emerges for two reasons: to conduct a local study that shows the level of Coimbra's friendliness to the elderly and to further explore the methodology of evaluating urban age-friendliness, particularly one that allows a quantitative analysis of its relation with other variables. After a literature review, we concluded that quality of life has not been studied in relation to city aspects. By relating the two concepts, we attempted to evaluate the effect of each city domain of Coimbra on the quality of life of respondents, providing clues for future interventions specifically aimed at those city aspects that reveal stronger associations with various quality of life domains.

Brief description of the city of Coimbra

One of the first steps to evaluate the city is outlining the community profile that includes its main geographical, demographic, social and economic features[10].

The municipality of Coimbra has an area of 319.4 km² and is a district capital. It is located in the center of Portugal, in the Lower Mondego (*Baixo Mondego*), at approximately 200 km from

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the capital and 115 km from the second largest city in the country. It has a strategic and peripheral position in Portugal and is organized around the hill that includes the Historical Center (subdivided in two areas named *Alta* and *Baixa*), extending to the left bank of the Mondego River[17]. In the period 1981-2010, Coimbra had a maximum temperature of 41.6º C and a minimum of -4.6º C (Portuguese Institute for Sea and Atmosphere).

It has an elevated number of higher education institutions, and an increased transient student population is noted throughout most of the year. The Hospital and University Center of Coimbra is one of the best in the country, according to the *rankings* of Performance Evaluations of Public Hospitals in Continental Portugal[18-20]. The University of Coimbra (that includes the *Alta* and *Sofia* areas), *ex libris* of the city, has recently been elevated to UNESCO's World Heritage status[21].

According to the 2011 Census[22], Coimbra's 18 parishes total 135.085 inhabitants (62.749 males and 72.336 females), with a population density of 449 individuals per km². Considering annual estimates of the resident population by the National Institute of Statistics, the elderly dependency ratio is 36.7% and the ageing index is 187.3%. The number of working-age individual per elderly (potential sustainability index) is 2.7 and the longevity index is 48.2%. The resident population by age group is 9.765 inhabitants aged 60-64 years, 9.293 aged 65-69 years, 7.130 aged 70-74 years and 15.303 inhabitants aged 75 years or over. The elderly population (over 60 years old) accounts for 30.7% of Coimbra's population. Regarding housing and real estate, and according to the 2011 Census[22], Coimbra has 79.193 classic family dwellings, 56 non-classical family dwellings and 206 collective dwellings.

Objectives

The following objectives were defined for this study: i) to analyze the Checklist of Essential Features of Age-Friendly Cities[1] adaptation properties; ii) to evaluate its suitability as an evaluation tool for use in future studies; iii) to study Coimbra's level of Age-Friendliness in the eight dimensions considered and its relationship with age, academic qualifications and income; iv) to study the relationship between the various domains of quality of life of the elderly and the eight aspects of the city considered; v) to identify city dimensions that can be improved based preferably on the criterion of its relationship with quality of life.

Methodology

Procedures

Building on a Bottom-Up approach, the target population was involved in the city's assessment process, taking into account their suggestions and needs. Quantitative information was collected through a questionnaire on various urban life aspects, and respondents could take the liberty of contributing with suggestions. We used IBM's *Statistical Package for Social Sciences* (SPSS v.20) to perform the statistical analysis. In the univariate description, we used measures of central tendency and dispersion. In the bivariate analysis, we used the Pearson correlation coefficient, the Student's t-test for independent groups and the analysis of variance (ANOVA). We established the internal consistency of the study's scales using Cronbach's Alpha and calculated the verification of sample suitability for factor analysis using Bartlett's Sphericity Test and the Kaiser-Meyer-Olkin Sampling Adequacy Index (KMO). We performed the confirmatory factor analysis (CFA) to verify identified factors' fit level in the expected structure. The χ^2/gl (chi-square ratio and degrees of freedom), comparative fit index (CFI) and goodness of fit index (GFI)[23] were used as fit quality indexes. Model fit was good for CFI and GFI values higher than 0.9[24]. For CFA, we used the AMOS® 18.0 program (IBM SPSS Inc, Chicago, IL). To determine the convergent validity with proximal constructs, we used the correlation analysis between the *CEFAFC* dimensions (core features or areas of city life) and the WHOQOL-Bref "Environment" domain.

We asked institutions and participants permission to collect information. We outlined respondents confidentiality issues, study objectives, methodological issues and voluntary collaboration in the cover sheet of the evaluation protocol.

Instruments

The evaluation protocol included a brief sociodemographic questionnaire, an adaptation of *CEFAFC* and the Portuguese version of WHOQOL-Bref[25].

WHOQOL-Bref

The WHOQOL-Bref aims to assess the quality of life of adult individuals[25] based on the WHO definition of quality of life. Initially developed by the WHOQOL Group, it was validated for Portugal by Canavarro et al.[25] from the Portuguese ver-

sion of the WHOQOL-100, with a shorter duration of application but maintaining satisfactory psychometric features[26,27]. While the instrument was developed as a self-response questionnaire, its application (when and as required) can be done through interview or assisted by an interviewer. It encompasses 26 items (α = .92), in a 5-point Likert scale that evaluate four domains: Physical Health (7), Psychological (6), Social Relationships (3) and Environment (8). It also includes a facet for general quality of life (2)[25].

Checklist of Essential Features of Age-Friendly Cities (adapted) – CEFAFC

The *CEFAFC* was developed taking into account the concerns expressed by older people and their service providers, based on the results of the consultation of the Age-Friendly Cities project[28]. It was intended for use by individuals or groups interested in making their cities friendlier to the elderly. It consists of 84 items, distributed in 8 topics that evaluate different areas of urban life[28]: Outdoor spaces and buildings (12), Transportation (17), Housing (7), Social Participation (8), Respect and Social Inclusion (9), Civic Participation and Employment (8), Communication and Information (11) and Community and Health Services (12).

The adaptation carried out for the purpose of this study kept all the items in full, and a 5-point Likert scale was added to measure the level of satisfaction with each item: 1-"Totally inadequate for me"; 2- "Inadequate for me but acceptable to most people"; 3-"Minimally acceptable to all"; 4-"Acceptable to all"; 5-"Good". A score of zero is given for "Don't know/Did not answer" or "Not applicable" options. A space for suggestions or comments was included at the end of the questionnaire.

The statistical analysis of the different topics of the questionnaire implied no more than one answer "Don't Know / Did not Answer". The "Not applicable" answers were discarded, but did not invalidate mean calculations. Thus, as can be seen in the following tables, the various topics have a total "*n*" different from each other, as well as from the total sample (215 individuals). This decision was based on the consideration of the difference between not knowing or deciding not to answer a question (e.g. *I don't know if there are any bike paths*) and considering that some statement does not apply to the subject and/or the city's reality (e.g. *this question does not apply because I don't use bike paths*). The mean of the total topic score was transformed into a 0-100 scale.

Participants

The participants lived in Coimbra and were aged 60-90 years (M = 71.03, SD = 6.97). The sample is non-probabilistic. At first, we contacted parish councils, institutions with educational projects for the senior population, day centers and the senior university for sample collection. No institutionalized individuals were included. 231 questionnaires were applied. The dropout rate was 3.9% (9) and 3% (7) of the questionnaires were excluded from the analysis because they did not fulfill the minimum inclusion requirements: completing the parameters "parish", "age" and "gender", a minimum age of 60 years and housing in one of the parishes of the municipality of Coimbra. The final sample comprised 215 people.

The sample consisted mostly of females (66%), married (56%), retired (86%) and with a profession categorized as a specialist in intellectual and scientific activities (25.1%) by the *Portuguese Classification of Occupations 2010*[29]. Most perceived their health as sufficient (46%) or good (35.8%), and only about one tenth (10.7%) of the respondents use a walking stick or a walker. The majority of respondents owns a home (74.9%) and lives with their core family (51.2%) in the parish of Santo António dos Olivais (64.2%). A substantive number did not answer the questions about personal income (22.8%); of those who did, the most common range of personal income was "more than € 801" (33%).

Results

The reliability studies conducted on the CEFAFC show internal consistency in all topics (α = .87 - Outdoor spaces and buildings, α = .92 - Transportation, α = .84 - Housing, α = .89 - Social Participation, α = .88 - Respect and Social Inclusion, α = .89 - Civic Participation and Employment, α = .87 - Communication and Information, α = .91 - Community and Health Services).

The Principal Components and Factor Analysis identifies eight factors explaining 50% of the variance. The suitability index of the KMO sample was .87 and the Bartlett's Sphericity Test was statistically significant at $p < .001$. Analyzing the eight factors, we found that the individual contribution of each topic to the *CEFAFC* construct has individual weights greater than .5 (Table 1).

The adjustment indices are respectively χ^2/gl=2.4; TLI=.93; CFI=.95[30]. Before showing the

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results concerning the characterization of the level of age-friendliness of the city of Coimbra, we should point out that data referring to the convergent validity will be detailed further below, when correlations between the topics of the Checklist and the WHOQOL-Bref domains are analyzed.

From Table 2, we can see that, after scale conversion, all scores are higher than 25.5 and lower than 50, indicating a subjective level of satisfaction with all the topics located between "inadequate for the respondent but acceptable for most of people" [21-40] and "minimally acceptable to all" [41-60]. The topic perceived with less subjective satisfaction was "Civic Participation and Employment" (25.5) followed by "Housing" (34.8) and "Respect and Social Inclusion" (36.8). The topic "Community and Health Services" came up with the best subjective evaluation (44.5), followed by "Social Participation" (40.9) and "Transportation" (40.0).

The sociodemographic variables selected for a more detailed analysis ("Age Group", "Literary Qualifications" and "Own Income") are related to the WHO criteria for the formation of *focus groups* according to the Vancouver Protocol methodology[10], in which participant selection and recruitment procedures must allow the constitution of groups with different ages ("60-74" and "75 and over") and different socioeconomic status ("Low" and "Middle"). In this study, academic qualifications and income variables were taken as indicators of socioeconomic status.

There were no statistically significant differences when comparing topic perceptions according to age groups (topic 1, t (186) = 0.175; p = .86; topic 2, t (156) = -.76; p = .45; topic 3, t (167) = -.75; p = .45; topic 4, t (177) = .58; p = .56; topic 5, t (168) = -.55; p = .58; topic 6, t (160) = .18; p = .86; topic 7, t (159) = .30; p = .77; topic 8, t (160) = . 03; p = .98). We can therefore say that the advancement of age does not seem to influence the perception of the core features of the city.

As far as literacy is concerned, respondents were categorized into three groups according to their education ("Up to the 1st Cycle of Primary School", "2nd and 3rd Cycles of Primary School" and "High School or Higher Education"). As can be seen in Table 3, there was only one statistically significant difference, which was related to "Social Participation": F (2, 174) = 3.163, p = .05. Post-hoc comparisons using the Tukey HSD test indicated that there is a significant difference between the group with schooling up to the 1st Cycle (M = 45.7, SD = 22.1) and the group with High School or Higher Education (M = 36.9, SD = 17.4); that is, subjects with more literacy perceived more negatively "Social Participation".

Table 1. Individual standardized regression weights of the topics contained in the Checklist of Essential Features of Age-Friendly Cities.

	Estimate
Topic 1 – Outdoor spaces and buildings (T1–OSB)	.75
Topic 2 – Transportation (T2–T)	.78
Topic 3 – Housing (T3–H)	.76
Topic 4 – Social Participation (T4–SP)	.83
Topic 5 – Respect and Social Inclusion (T5–RSI)	.83
Topic 6 – Civic Participation and Employment (T6–CPE)	.71
Topic 7 – Communication and Information (T7–CI)	.77
Topic 8 – Community and Health Services (T8–CHS)	.80

Respondents were further categorized into three groups according to their income. As can be seen in Table 4, there were no statistically significant differences according to income.

Finally, it is important to analyze the correlation between the perception of the different city topics and quality of life. Table 5 shows that the "Overall" quality of life is related to the perception of four city aspects: "Transportation" ($p < 0.01$), "Housing" ($p < 0.05$), "Respect and Social Inclusion" ($p < 0.05$) and "Community and Health Services" ($p < 0.01$). The "Physical Health" domain does not correlate significantly with any of the city topics. The "Psychological" domain correlates to a .05 level with "Housing" and "Community and Health Services". There is a negative correlation between "Civic Participation and Employment" and "Social Relationships" ($p < 0.01$). The WHOQOL-Bref "Environment" domain is positively correlated with all *CEFAFC* topics, except with "Civic Participation and Employment", thus supporting its convergent validity. All correlations of the "Environment" topic are significant at the 1% level, with the exception of the "Respect and Social Inclusion" topic, significant at the 5% level.

It is important to note that 39 respondents (18.4% of the total) made comments that were grouped according to its theme in order to evaluate which ones were most frequently mentioned. Thirty comments related to city aspects, while sixteen referred to other issues, mainly the accessibility of the questionnaires. Regarding the former, it should be noted that the most commented topic was "Outdoor Spaces and Buildings"; no comments were made about the "Civic Participation and Employment" topic.

Table 2. Descriptive statistics of the topics included in the Checklist of the Essential Features of Age-Friendly Cities.

	N	M (SD)	Md	Mo	Min	Max
Outdoor spaces and buildings (T1–OSB)	188	39.3 (16.5)	39.6	50.0	0.0	79.2
Transportation (T2–T)	158	40.0 (17.0)	40.9	50.0	2.9	89.1
Housing (T3–H)	169	34.8 (17.4)	35.7	39.29[a]	0.0	92.9
Social Participation (T4–SP)	179	40.9 (20.1)	40.6	50.0	0.0	90.6
Respect and Social Inclusion (T5–RSI)	170	36.8 (18.8)	37.5	50.0	0.0	93.8
Civic Participation and Employment (T6–CPE)	162	25.5 (18.8)	25.0	.00 [a]	0.0	93.8
Communication and Information (T7–CI)	161	37.9 (17.6)	40.0	50.0	0.0	84.1
Community and Health Services (T8–CHS)	162	44.5 (18.6)	45.8	47.9	0.0	89.6

a. There are multiple modes.

Table 3. Perception of city topics by age group (T Test) and literacy (ANOVA).

	60-74 n = 153	75 and over n = 62	T	Up to 1st Cycle of Primary School n = 74	2nd and 3rd Cycle of Primary School n = 63	> High School n = 73	F
	M (SD)	M (SD)		M (SD)	M (SD)	M (SD)	
T1–OSB	39.5 (17.7)	39.0 (13.3)	0.861	41.8 (15.8)	38.9 (13.6)	37.4 (19.3)	.32
T2–T	39.4 (17.5)	41.8 (15.4)	0.451	43.0 (19.4)	38.7 (13.2)	38.5 (18.0)	.33
T3–H	34.2 (18.1)	36.5 (15.6)	0.454	35.0 (18.4)	33.9 (15.9)	33.9 (17.1)	.92
T4–SP	41.5 (21.0)	39.6 (17.9)	0.561	45.7 (22.1)	39.5 (19.2)	36.8 (17.4)	.05*
T5–RSI	36.3 (19.1)	38.0 (18.1)	0.584	38.5 (17.0)	36.7 (19.2)	33.5 (18.2)	.33
T6–CPE	25.6 (19.1)	25.1 (18.1)	0.861	25.3 (20.1)	25.6 (18.7)	23.8 (16.0)	.86
T7–CI	38.2 (17.8)	37.3 (17.4)	0.767	40.5 (17.2)	36.3 (17.6)	35.0 (16.6)	.22
T8–CHS	44.5 (19.8)	44.5 (15.4)	0.980	45.0 (18.6)	45.2 (20.3)	42.1 (16.7)	.65

*$p < 0.05$.

Discussion

Regarding the first objective of this study, the analysis of the psychometric properties of the checklist's adaptation to a questionnaire, all topics showed good internal consistency (Cronbach's $\alpha \geq .84$ in all topics). The factorial structure was analyzed by Principal Components Analysis. The eight factors explain 50% of the explained variance. The relevance of the factor analysis, which was excellent according to Hutcheson and Sofroniou[31], was verified using the Kaiser-Meyer-Olkin (KMO) sampling adequacy index and Bartlett's Sphericity test. The contribution of *CEFAFC*'s topics was adjusted, indicating that the instrument has factorial validity. There is convergent validity of the "Environment" domain of the WHOQOL-Bref tool with all areas of city life evaluated by the *CEFAFC's* adaptation, except for "Civic Participation and Employment". Despite these positive aspects, respondents felt difficulties in answering the questionnaire, with some pointing out in the comments section that it was long, time-consuming and complex. Subsequent work is required to improve this evaluation tool (for example, by reducing the number of items and/or adapting the language used).

The topics perceived with greater satisfaction by the sample were the "Community and Health Services", "Social Participation" and "Transportation". Those with the lowest levels of satisfaction were "Civic Participation and Employment", "Housing" and "Respect and Social Inclusion". The greatest satisfaction with "Community and Health Services" can be partially understood by referencing the quality of the Coimbra University Hospital Centre, which has an enviable position in the ranking of Costa and Lopes[18-20], and the designation of the University of Coimbra as a "Reference Site"[32] due to its implementation of innovative practices to increase the efficiency of health and social care systems within the framework of the "Innovation Partnership on Active and Healthy Ageing". The 23 Health Centers in

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Table 4. Perception of city topics according to personal income (Mean, Standard Deviation and ANOVA).

	Up to 350€ n = 22	351 to 500€ n = 33	501 to 800€ n = 40	801 to 1500€ n = 43	> 1500€ n = 28	
	M (SD)	M (SD)	M (SD)	M (SD)	M (SD)	F
D1–EEE	38.7 (14.9)	38.0 (18.4)	44.2 (14.7)	37.1 (16.8)	40.0 (18.6)	0.9^{ns}
D2–T	38.2 (14.8)	40.2 (17.5)	42.8 (16.7)	42.0 (18.6)	35.3 (17.7)	0.7^{ns}
D3–H	30.9 (11.6)	36.9 (15.3)	35.5 (18.9)	35.4 (20.6)	32.7 (14.4)	0.4^{ns}
D4–PS	48.9 (18.7)	43.5 (20.3)	43.9 (21.7)	38.6 (20.1)	37.1 (17.7)	1.3^{ns}
D5–RIS	40.0 (16.7)	39.4 (18.4)	37.6 (17.1)	35.2 (20.2)	36.7 (18.8)	0.3^{ns}
D6–PCE	26.5 (18.5)	30.4 (17.2)	26.0 (20.7)	22.0 (17.8)	26.7 (13.6)	0.8^{ns}
D7–CI	43.1 (17.3)	42.4 (15.2)	39.5 (15.8)	33.8 (18.8)	36.4 (17.6)	1.3^{ns}
D8–SCS	46.5 (14)	45.2 (17.9)	45.2 (21.3)	43.7 (19.3)	44.7 (12.9)	0.1^{ns}

ns = not significant

Table 5. Correlation (Pearson) between city topics and WHOQOL-Bref domains.

	Overall	Physical Health	Psychological	Social Relationships	Environment
T1–OSB	.15	-.07	0.03	.09	.21**
T2–T	.23**	-.07	0.14	-.05	.20*
T3–H	.17*	.00	.16*	.03	.21**
T4–SP	.13	-.05	.06	-.03	.23**
T5–RSI	.18*	-.05	.09	.04	.21*
T6–CPE	.10	-.13	-.12	-.24**	.03
T7–CI	.11	-.07	.06	-.04	.23**
T8–CHS	.28**	.02	.19*	-.01	.31**

** Significant correlation at 0.01 (bilateral) level; * Significant correlation at the 0.05 (bilateral) level.

the district of Coimbra, along with the hospitalization units of the integrated continuous care network should also be taken into account in the analysis of this result. Comparatively, Porto's elderly[15] refer more to community services than health services, especially religious services and social support institutions.

The lower average score in the area of "Civic Participation and Employment" may reflect, in part, the high unemployment rate and economic crisis lived in the country during the period of data collection. In 2015, the unemployment rate reached 12.4% of the population[22]. Regarding the "Housing" parameter, Pinto and Lopes[13] indicate that Portuguese dwellings were not built taking into account age as a factor, resulting in mobility difficulties and degraded habitability and comfort, which in turn translate into worse quality of life. In this study, there were suggestions such as "financial support for the preservation of real estate" and "Parish Councils should have a technician to make small domestic repairs such as changing a lamp, repairing a dripping faucet, treating blinds that do not work. This would be paid for by the elderly, according to their possibilities", as equally suggested by Aveiro's elderly[16].

These comments lead to a consideration of the difficulties experienced in the urban rehabilitation and regeneration programs that have been recently carried out in Portugal (RECRIA, REHABITA, RECRIPH and SOLARH). Madeira[33] states that these programs are "a far cry from responding to effective rehabilitation needs" (p.73) and had "a reduced applicability due to issues of different natures" (p.74). Although some of these programs were implemented in Coimbra, only interventions corresponding to 3.69%, 11.07% and 3.61% of the needs identified by the RECRIA, RECRIPH and SOLARH programs, respectively, were approved.

The lack of distinction in the perception of the different city topics between the two age groups suggests that the perception of the conditions of the city of Coimbra is cross-sectional to age(s). However, other studies[14,17] have identified differences in city perception between participants with different ages ("60-74" and "75 and over"), which implies recognizing the idiosyn-

cratic needs of these groups. The perception of city aspects also seems not to be influenced by personal income. Regarding the influence of literacy on the perception of the city, we noted that respondents with higher schooling are less satisfied with the possibilities of social participation, reflecting a greater dissatisfaction with space accessibility, variety, price and conditions and information about the city's social events. This may suggest the need and desire of older people with higher education in attending / participating in events that meet their cultural needs. Gonçalves et al.[34] point to a progressively increasing number of elderly with sharp intellectual abilities, more educated and interested in remaining active, which may require a more comprehensive participatory provision. Qualitative studies are suggested to further analyze the nature of these relationships.

The overall quality of life is correlated with various city topics. Greater satisfaction with "Transportation" is closely associated with a higher overall quality of life. This result is in accordance with the study conducted by Santos et al.[3], in which Porto dwellers refer to mobility and road infrastructure as one of the most important factors for their quality of life. Despite being the topic with the third highest satisfaction rate, the city of Coimbra is described (in the suggestions / comments section) as "organized for private transportation" and that "public transports are not suitable for the elderly". Let us remember that Coimbra has certain particularities, both in its formation and growth, which we need to consider. As mentioned by Ferreira[35], the agglomeration of the city took place at different points, with the formation of nuclei with different characteristics and needs, unconnected between themselves. The expansion of these nuclei led to a merging and interpenetration process that originated an urban organism of peculiar morphology and as a result, Coimbra is now a polynucleated city[35]. This may explain the greater need for mobility resources and higher quality and frequency demands of public transport.

There is a significant relationship between "Overall" (and "Psychological") quality of life and perception about "Housing" in Coimbra, being that people who evaluate accommodations/ living spaces has having better conditions have a better perception of quality of life. Coenders et al.[36] studied this relationship, stating that the satisfactory evaluation of housing conditions contributed significantly to the perception of quality of life of elderly people in the city of Girona.

The topic "Respect and Social Inclusion" also obtained a positive correlation with "Overall" quality of life. Respect for the specific needs of older people and its inclusion in the various activities may create a greater sense of belonging and usefulness of many people in this age group, counteracting the phenomena of contracted social networks in old age[37]. The literature[36,38,39] points out that the perception of health is intimately related to the quality of life. With this in mind, the correlation between satisfaction with "Community and Health Services" and "Overall" (and "Psychological") quality of life is not a surprising result. Unlike other locations[13], namely inland Portugal, the proximity and accessibility of these services to the elderly community may justify greater satisfaction with the topic.

Contrary to expectations, due to the changes and difficulties that ageing entails, the different city topics do not correlate with the "Physical Health" quality of life of the elderly people of Coimbra. Also, there is a negative correlation between the topic "Civic Participation and Employment" and the "Social Relationships" facet of WHOQOL-Bref. The significance of this relationship deserves further analysis in future studies.

Conclusions

This study allowed us to observe the elderly's perception vis-à-vis the city in which they live and what city topics have significant relationships with quality of life. We can see that the topics that relate to more parameters of quality of life are "Community and Health Services" and "Housing". Both have correlations with the "Overall", "Psychological" and "Environment" domains.

However, the satisfaction of the elderly with these city topics is different. Satisfaction with "Community and Health Services" is the highest, while satisfaction with the "Housing" topic is the second lowest, flagging an area for improvement and intervention, the effects of which can be reflected in an increased quality of life. On the other hand, sustaining the quality of life in Coimbra seems to be closely related to the maintenance of health policies.

"Transportation" and "Respect and Social Inclusion" correlate with two domains of quality of life ("Overall" and "Environment"). As mentioned earlier, the "Transportation" topic achieves one of the highest scores (when compared to other topics) although some aspects must be the object of improvement according to respon-

dents. The topic "Respect and Social Inclusion" obtained a low level of satisfaction, and achieved the third lowest score. This dissatisfaction means that the elderly of Coimbra feel that there is no consideration for them in the community, in the services and in the family[3], indicating an area that can also be improved.

Collaborations

NM Paiva worked on research, design and writing of the paper. F Daniel and AG Silva worked on the methodology and final review. HT Vicente worked on design, review and final writing.

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Article submitted 25/01/2017
Approved 13/07/2017
Final version submitted 15/07/2017