LOCAL COMMUNITY PROGRAMMES AND SUCCESSFUL AGEING: A STUDY FROM THE NORTH-EAST OF PORTUGAL

PROGRAMAS COMUNITARIOS LOCALES Y ENVEJECIMIENTO EXITOSO: UN ESTUDIO DEL NORDESTE DE PORTUGAL

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ABSTRACT

The ageing of the population poses challenges for both policies and support systems for older people. In Bragança, a city in the North-East of Portugal, this phenomenon has a great impact and that is why the municipality is implementing community programmes to promote successful ageing. Objective: examine indicators of successful ageing in people aged 55 and over that participate in community programmes, using multiple correspondence analysis (MCA). A total of 50 were randomly selected and another 50 persons joined the previous group according to gender and age stratification criteria, resulting in a total of 100 in two sub-samples: the group that took part in municipal communiy programmes and the group that did not participate in such programmes. In both groups a multidimensional gerontological evaluation was applied to collect sociodemographic characteristics, cognitive performance, psychological well-being, social net work and independence for instrumental activities of daily living . Based on the proximity between the categories of social spaces, it was observed that participants involved in community programmes showed higher levels of psychological well-being and independence in instrumental activities. The group that did not participate in the community programmes showed higher risk of isolation, lower psychological well-being, higher level of dependence and low cognitive performance. The evidence shows the importance of this type of programmes for a successful ageing and that the methodology of multiple correspondence analysis (MCA) stands as a good strategy to evaluate the benefits of these programmes.

RESUMEN

El envejecimiento de la población plantea desafíos tanto en las políticas como en los sistemas de apoyo dirigidos a las personas mayores. En Bragança, una ciudad del Nordeste de Portugal, este fenómeno tiene un gran impacto por lo que el municipio implementa programas comunitarios para promover un envejecimiento exitoso. Objetivo: Examinar indicadores de envejecimiento exitoso en personas de 55 años o más que participan en programas comunitarios, utilizando análisis de correspondencia múltiple. Se seleccionó aleatoriamente un total de 50 personas y otras 50 personas se incorporaron al grupo anterior según criterios de estratificación por sexo y edad, resultando un total de 100 en dos submuestras: el grupo que participó en programas comunitarios municipales y el grupo que no participó. En ambos grupos se aplicó una evaluación gerontológica multidimensional con el fin de recolectar datos sobre características sociodemográficas, desempeño cognitivo, bienestar psicológico, red social y independencia funcional. A través de la proximidad entre las categorías del espacio social, se observó que los participantes involucrados en los programas municipales muestran niveles más altos de bienestar psicológico y niveles más altos de independencia en las actividades instrumentales de la vida diaria. El grupo que no participa en dichos programas presenta mayor riesgo de aislamiento social, menor bienestar psicológico, mayor nivel de dependencia y desventaja cognitiva. La evidencia sugiere la importancia de los programas comunitarios para un envejecimiento exitoso y la metodología del análisis de correspondencia múltiple (ACM) como una buena estrategia para evaluar sus beneficios.

KEYWORDS

Successful ageing; community programmes; multiple correspondence analysis.

PALABRAS CLAVE

Envejecimiento exitoso; programas comunitarios; análisis de correspondencias múltiples.

1. INTRODUCTION

1.1. PURPOSE OF THE INVESTIGATION

Population ageing is a reality that has been concerning political and institutional agents. IN The European Union (of the EU-27) projections suggest that the proportion of people 65 years old and above are expected to rise (now in 20,3 %) and the percentage of people 80 years old and over is expected to more than double by 2100, reaching 14,6 % population of the total (Eurostat, 2019). Population levels are decreasing in Bulgaria, Greece, Spain, Croatia, Hungary, Poland, Portugal, Romania and the Baltic Member States (PORDATA, 2019; Eurostat, 2019) as a result of the natural population decline.

This demographic transition is accentuated by the emigration of the younger population has been particularly evident in some regions of Portugal after the financial and economic crisis that settled in the country in the last decade, demanding a more effective care system for the elderly. The need for more and better care services is due to the increasing number of older and frail adults, the decrease in family caregivers and the complexity of gerontological care (Falcão *et al.*, 2017) needs more attention from central and local authorities (Bloom *et al.*, 2015). Also the promotion of active or successful ageing in Portugal registers several initiatives however there is still a way to go for this approach to be reflected in the health and quality of life of the elderly, ensuring the full realization of their dignity, quality and autonomy.

In this context, this article examines indicators of successful ageing in people 55 years old and over from Bragança, North-East Portugal, according to their participation in local community programmes. This is a study multi-centre developed in three regions of Portugal: one in the northern interior (Bragança), another in the northern coast (Viana do Castelo) and a third in the center of the country (Coimbra), within the strategic project of «AgeNortC: Ageing, social participation and early detection of dependence».

1.2. BACKGROUND

The increase in life expectancy over the last few years is a great achievement, but how can we maintain the quality. The scientific community is engaged in the study of the process of human development, looking for appropriate interventions (Fernández-Ballesteros, 2009; Rodrigues & Martins, 2014; International Longevity Center Brazil, 2015). In this situation, there is a need to create and increase community programmes, promote capacities, helping to maintain the well-being and quality of life, autonomy and independence of elderly people and to break the countless barriers that prevent their participation in society (United Nations Economic Comission for Europe, 2012; World Health Organization, 2012).

According to framework of ageing from WHO (2002), active ageing can be understood as the process of optimizing opportunities for health, participation and security in order to enhance quality of life. A recent review of the framework for active ageing (International Longevity Center Brazil, 2015) this organization adds another pillar - lifelong learning, thus highlighting education in the face of the longevity revolution.

Developing transversal policies and multidisciplinary action strategies, flexible and close-to strategies that allow all elderly people to enjoy a active ageing is an ethical imperative with active involvement of the elders themselves, health professionals, families and society.

In this sense, it is important to highlight some of the indicators of Active Aging Index (SNS, 2017, in United Nations Economic Commission for Europe & European Commission, 2015). According to the same source, among the 28 countries of the European Union, Portugal is located in:

- 16th place in relation to the «Global Active Ageing» indicator;
- 18th place in relation to the indicator «Capacity for Ageing»;
- 21st place in relation to the «Social Participation» indicator;
- 21st place in relation to the «Independent Living» indicator;
- 8th place in relation to the «Employment» indicator.

The indicators presented above indicate a path yet to go and highlight the need for research development in this area, offering an opportunity for reflection and implementation of changes leading to its improvement.

Active ageing as a paradigm of intervention for public policies is the process of optimizing opportunities for health, participation and security in order to enhance quality of life, reports to the beginning of the 21st century. The term 'active' in the ageing process refers to «continuing participation in social, economic, cultural, spiritual and civic affairs, not just the ability to be physically active or to participate in the labour force» (World Health Organization, 2002). Maintaining functional capacity contributes to the well-being of elderly people, with functional capacity being the result of the interaction of the person's intrinsic capacities (physical and mental) with the environment (World Health Organization, 2015a).

Behavioural determinants such as physical activity are factors that can prevent functional decline and various diseases, and also provide a better quality of life (Preto el al., 2016; Garcia *et al.*, 2019) Physical activity in older adults denies the myth that it is too late to adopt healthy lifestyles which allow to live with quality and extended longevity (World Health Organization, 2002). Increasing the functional capacity of elderly is a point of reference for the formulation of a guiding model of intervention that defines priorities, monitoring and evaluation parameters, and brings dynamics and synergies of cooperation between stakeholders and institutions within the scope of the various Priority Programmes and others Health programmes and projects and several partners committed to improving health, participation, safety and research standards.

To address active ageing and its programmes it is necessary to adopt an epistemological stance. Recognition of the importance of the social conditions in which the elderly live and that the main factors that shape health are not limited to the treatments of the clinical area but also to the conditions of life that they experience. This is greatly influenced by the economic and social resources as well as opportunities (Cockeram, 2007; Afonso, 2017). It is in this line of action that this study is located considering that it is necessary to go beyond the biological concept of ageing (cellular senescence, morphological, physiological and biochemical changes, etc.) and look at aging from a psychosocial perspective, understanding how each society conceptualizes this later life as a social structure included in a particular historical moment (Pimentel *et al.*, 2019; Cavalcanti *et al.*, 2018).

Another approach particularly relevant in the field of ageing is successful ageing. Successful ageing is a strengths-based theory of ageing (Teater & Chonody, 2020) and the works led by Rowe and Kahn (1997, 2015) are particularly relevant in this subject. These authors defend a vision of successful ageing based on three criteria: (1) absence of illness and disability resulting from the disease; (2) high physical and cognitive functioning; (3) active involvement with life. Of these criteria, what has deserved more questioning is the absence of disease and disability, because extreme longevity is associated with an increase in chronic diseases. Hence, Kahana *et al.*, (1996, 2014) has suggested a model of ageing where the disease becomes a normative stressor associated with ageing. Likewise, Baltes and Baltes (1990) propose a model based on strategies of selective optimization with compensation (SOC). This means that the ageing moves from biophysical condition (disease) to internal and external resources, capable of contributing to well-being and quality of life. It is in this line community programmes - initiatives with the potential to contribute to well-being and quality of life (Bastos *et al.*, 2020) - can be envisaged. Recent studies (Menichetti *et al.*, 2016; Coll-Planas, 2017) in which the benefits of intervention in elderly people are analyzed show mixed effects on the well-being of elderly people. On the other hand, the concept of successful ageing has sufficient potential to continue to advance in the optimization of human ageing. Community programmes are undoubtedly an opportunity for researchers interested in the deliberate and systematic promotion of ageing.

According to Cavalcanti *et al.*, (2018) it is not possible to establish direct causality of any single determinant to elderly well-being, but on the whole, those that most affect health. The authors suggest that social determinants (and the interaction between them) are adequate indicators for assessing conditions in ageing populations. In view of the need to consider cross-effect and the interaction from determinants, social and health, a multivariate statistical approach was favoured, namely a multiple correspondence analysis (MCA), which aim to graphically project the categories into a social space and to identify associations between some determinants and indicators of well-being. Special attention was paid to the positioning of the categories that differentiate, or not, the elderly participated in sports/physical activity programmes promoted by the local community of Bragança.

1.3. OBJECTIVE

Considering this framework, the objective of this study is to examine the contribution of two municipal community programmes «Active Bragança and Senior Sport in the Countryside» for successful ageing, using multiple correspondence analysis (MCA).

1.4. JUSTIFICATION

Demographic ageing and its consequences tend to mobilize interests in various sectors of social life and are considered one of the major challenges of society with implications for public policies. To help meet this challenge several authors and organizations (World Health Organization, 1999, 2002, 2012, 2015b; Rodrigues & Martins, 2014; Barrios & Fernandes, 2014), point out the need to adopt a multidisciplinary perspective of knowledge integration for a correct and efficient evaluation of policy measures to be designed. A true commitment to invest in active and healthy ageing must be transversal and reflected in all authorities (WHO, 2015b). Sports programmes in the region of Bragança are a good example of this commitment. Some returns

will soon be evident but others, while important, will only occur in the long run. That is why quantifying and fully considering the extent of investments and the dividends they generate will be crucial. It is therefore important to obtain a thorough knowledge of the reality of investment and to list a set of actions that allow rethinking ageing in a structured way, as well as repeating good practices that lead to successful ageing. Considering that successful ageing and active ageing share the same positive view of ageing (Teater & Chonody, 2020), so in the present study we assume these two terms are equivalent.

2. DESIGN AND METHOD

The local community programmes «Active Bragança» and «Senior Sport in the Countryside» mission is to promote recreational, cultural and leisure activities, as a mechanism that provides access of the senior population to community life. These programmes are very similar and their main objective is to promote successful ageing, quality of life and the well-being of the elderly.

«Senior Sport in the Countryside» program was created in 2010, especially aimed at the senior population in rural areas of the local authority of Bragança. Currently it has 200 elderly enrolled, and promotes gymnastic activities indoor once a week and water aerobics classes once a month in Bragança`s swimming Pool.

«Active Bragança» program was created in 2018, and is especially aimed at the senior population in urban areas of the local authority of Bragança. Currently it has 120 seniors enrolled and promotes indoor gymnastic activities at the Civic Center twice a week and water aerobics classes once a week at Bragança`s swimming Pool. Both programmes start in September and finish at the end of May, with a duration of 9 months, each year.

This is a cross-sectional study. Starting from a pool of 320 elderly who were enrolled in the programmes «Active Bragança» and «Senior Sport in the Countryside», 50 were randomly selected. The size of this sample was stipulated in articulation with all the research centres of the project of «AgeNortC: Ageing, social participation and early detection of dependence». It was the responsibility of all research centres (Bragança, Viana do Castelo e Coimbra) to collect samples of the same size in the areas assigned to them.

During the interview process of the 50 elderly who participated in the sports activities promoted by the local authority they were requested to point out friends, relatives or neighbours who were not included in any program, in order to obtain a second sample of 50 elderly people with the same age group and gender characteristics.

Therefore, we are dealing with a total sample of 100 elderly people in the local authority of Bragança divided into two subgroups: elderly people participating in sports activities promoted by the local authority (intervention group) and elderly people who did not (comparison group).

Once the sample was drawn up a questionnaire survey was carried out, multidimensional gerontological protocol was applied of "AgeNortC" project (sociodemographic data, MMSE (Folstein *et al.*, 1975); LSNS-6 (Lubben *et al.*, 2006); IADL (Lawton & Brody, 1969), Ryff -18 (Ryff, 1989) and WHOQOL-BREF (World Health Organization, 1998).

The assessment of cognitive functioning was established through the Mini-Mental State Examination (MMSE) developed by Folstein *et al.* (1975) adapted to the portuguese population by Morgado *et al.*, (2009). The MMSE contains questions to evaluate orientation, memory, attention, writing, and also problems in object naming, follow-up of verbal and written commands and drawing. From this set of questions of cognitive performance an evaluation score ranging from 0 to 30 was obtained.

The evaluation of the elderly social network was based on the questions used by the short version of Lubben Social Network Scale (LSNS-6) by Lubben *et al.*, (2006) and adapted to the Portuguese version of Ribeiro et al (2012). The LSNS-6 is based on two sets of questions, which assess, on the one hand, family relations and, on the other hand, relations of friendship. The questions are (1) «How many family members do you see or talk to at least once a month?» (2) «How many family members do you feel close enough for calling and asking for help?» and (3) «How many family members do you feel comfortable talking about personal matters?» These three items are repeated in relation to friends, including those who live in the neighbourhood of the elderly. The total score of the scale results from the sum of the 6 items, which ranges from 0 to 30.

The evaluation of the level of dependency was made through the questions that assess the level of independence of the elderly person in the accomplishment of instrumental activities. Like Lawton & Brody (1969), eight scored questions were asked about tasks such as using the telephone, shopping, meal preparation, housekeeping, laundry, transportation, preparing medication, and managing money (adapted to the Portuguese population by Sequeira, 2007).

The evaluation of psychological well-being of the elderly was done with reference to the Portuguese version of the psychological well-being scale of Carol Ryff (adapted to the Portuguese population by Novo, Silva, & Peralta, 1997). From a set of 18 agree/disagree questions regarding self-acceptance, positive relations, autonomy and meaning of life the score of this scale was determined.

WHOQOL-BREF is organized into four domains: physical, psychological, social relations and environment. It consists of 26 questions, two of which are more general, related to the general perception of quality of life and general perception of health and the remaining 24 represent each of the 24 facets. All items are rated from 1 to 5 points. Three items, referring to questions asked in a negative way (Q3, Q4 and Q26), must be inverted (World Health Organization, 1998, adapted to the Portuguese population by Vaz Serra *et al.*, 2006).

The gerontological assessment lasted approximately 30 minutes and was conducted by an interviewer. Eight pre-tests were performed on eight seniors, and there were no misunderstandings detected.

3. FIELDWORK AND DATA ANALYSIS

The data was obtained between February and May 2018. The multiple correspondence analysis: there are many situations of empirical research, in which models of analysis based on a multifaceted and relational approach to the object of study are used, which underline their characteristic complex configuration. So, the understanding of the complexity of many objects of study leads to the development of analyses based on structural approaches. For such an ap-

proach to be possible, it is necessary to identify multiple factors considered relevant in order to capture the structure of the phenomenon under study and their multidimensional complexity (Carvalho, 2008). Given the complexity and multidimensionality of the successful ageing process, we sought to adopt a multivariate methodology to cover interactions between multiple social and well-being indicators to examine them. This methodology is a multiple correspondence analysis (MCA), which was created by Jean-Paul Benzécri (1984) and developed based on contingency tables, crossing qualitative variables and absolute frequencies.

Special consideration was given to the graphic positioning of the categories. These were submitted to a transformation process and optimal quantifications were estimated to define their graphical location in the multidimensional space. So, the coordinates of the categories were estimated in order to analyse multiple associations. Each category positioning in the chart reflects a combination between multiple properties (well-being and social determinants), defined based on a "multidimensional coordinate system"(Bourdieu, 1989, p. 133).

Concerning the variables, these will have to be preferably of a qualitative nature, which are translated into categories. This consideration was a precondition that led to a process of transformation of some well-being indicators (IADL, MMSE, LSNS-6, Ryff-18), as can be seen in Table 1.

Taking into account the precondition mentioned, the table below shows the cut-off points that led to the categorical recoding of the well-being indicators to project in the MCA.

Table 1: Transformation and recoding of variables

Indicator	cut-off points	Reference
MMSE	Thresholds to consider for cognitive impairment according to literacy: 22 points in individuals for 0-2 years; 24 for 3 - 6 years; 27 for> 7 years	Morgado et al., (2009)
LSNS-6	LSNS ≥ 12: Satisfactory social network LSNS < 12: At risk of social isolation	Lubben et al., (2006)
IADL	Scores below 8 indicate dependence	Lawton & Brody (1969)
Ryff-18	Lower psychological well-being: < first quartile (75) Median psychological well-being: > first quartile (76) up to the third quartile (85), corresponding to the central 50% of the sample distribution Greater psychological well-being: > third quartile (85)	Autores do artigo

Source: Own elaboration

After the transformation procedure of variables the conditions are gathered for the accomplishment of the MCA, along with other variables that previously assumed a categorical nature, namely gender (male and female), sample group (elderly people participating in sports activities promoted by the local authority and elderly people who did not), age groups (55-64 years old,

65-74 years old and 75-84 years old) and level of education (up to 4 years of schooling, 5-12 years of schooling, higher education).

These variables (gender, sample group, age groups and level of education) were considered because they can express different social circumstances for ageing. The most relevant is the sample group that differentiates who participates in activities promoted by the local authority.

4. RESULTS

The Table 2 shows the social characteristics that describe the sample of 100 elderly (intervention and comparison groups). From the analysis we noted a very feminised sample of elderly (70% of the female gender), mostly represented by the age group 65-74 years (64%), with an average age of 70,6 years (standard deviation 5,3 years). In our sample 70% of the elderly are married or live in common-law marriage and 22,0% are widowers.

The sample level of education is low; more than half (51%) of the elderly have only completed the 4th year of schooling. The average is 6,4 years of schooling (standard deviation of 4,0 years).

The majority of the respondents (88%) are retired. Among the occupational groups (ISCO-08) – occupations that were performed in the past or are performed today – there is a large representation of elementary occupations and service or sales workers. The household monthly income of the sample has an intermediate level (68% receive between □ 421 and □ 2000).

Highlighting the similarities between the intervention and comparison groups, it was verified that both samples had the same gender and age group distribution. This is the result of the fieldwork management, in order to respect the criteria of stratification according to gender and age.

Concerning the differences, there are social characteristics that distinguish the intervention group and the comparison group. The most representative are the higher level of education and the greater representation of occupational groups at the top of the hierarchy (managers and professionals specialists in intellectual and scientific activities) in the comparison group, which also represent higher incomes. In this group we can also find more separated or divorced subjects and a greater proportion of singles too.

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Table 2: Social characterization of sample and groups

	Total Sample (n=100)		Intervention Group (n=50)		Comparison Group (n=50)	
	n	%	n	%	n	%
Gender						
Female	70	70%	35	70%	35	70%
Male	30	30%	15	30%	15	30%
Age Group						
55 – 64	10	10%	5	10%	5	10%
65 – 74	64	64%	32	64%	32	64%
75 – 84	26	26%	13	26%	13	26%
Marital status						
Single	6	6%	5	10%	1	2%
Married/ Common-law marriage	70	70%	34	68%	36	72%
Separated/ Divorced	2	2%	0	0%	2	4%
Widower	22	22%	11	22%	11	22%
Level of education						
No Schooling	2	2%	1	2%	1	2%
1-4 Years	49	49%	23	46%	26	52%
5-6 Years	18	18%	13	26%	5	10%
7-9 Years	9	9%	3	6%	6	12%
10-12 Years	13	13%	6	12%	7	14%
Higher Education	9	9%	4	8%	5	10%
Occupational Status						
Employed	14	14%	4	8%	10	20%
Unemployed	2	2%	2	4%	0	0%
Retired	84	84%	44	88%	40	80%
Occupational Groups (ISCO-08)						
Managers	3	3%	1	2%	2	4%
Professionals	11	11%	3	6%	8	16%
Technicians and associate professionals	4	4%	3	6%	1	2%
Clerical support workers	9	9%	5	10%	4	8%
Service and sales workers	25	25%	16	32%	9	18%
Skilled agricultural, forestry and fishery workers	1	1%	0	0%	1	2%
Craft and related trades workers	3	3%	3	6%	0	0%
Plant and machine operators and assemblers	9	9%	6	12%	3	6%
Elementary occupations	32	32%	13	26%	19	38%
Armed forces occupations	3	3%	0	0%	3	6%
Household monthly income						
Lower than €250	2	2%	2	4%	0	0%
From €250€ to €420	9	9%	4	8%	5	10%
From €421 to €750	22	22%	11	22%	11	22%
From €751 to €1000	16	16%	10	20%	6	12%
From €1001 to €2000	30	30%	18	36%	12	24%
Higher than €2000	21	21%	5	10%	16	32%
Type of propriety						
Villa/Home	83	83%	48	96%	35	70%
Apartment	17	17%	2	4%	15	30%
Age	Average 70,6 (sd 5,3)		Average 70,5 (sd 5,1)		Average 70,8 (sd 5,6)	
Years of schooling	Average 6,4 (sd 4,0)		Average 6,2 (sd 3,8)		Average 6,7 (sd 4,1)	

Source: Own elaboration

The table 3 demonstrates that the sample is characterized by being mostly independent, by a low level of cognitive impairment and by weaknesses in its social network (76% of the elderly are at risk of social isolation).

Table 3: Psychological well-being, cognitive performance, social network and sample dependency level

	Total Sample (n=100)	
	n	%
Psycological Well-being (Ryff)		
Minor psychological well-being	27	27%
Median psychological well-being	49	49%
Greater psychological well-being	24	24%
Lubben Social Network		
Redundant social network	24	24%
Risk of social isolation	76	76%
Cognitive Performance (MMSE)		
No cognitive impairment	87	87%
Cognitive impairment	13	13%
Independency Level (IADL)		
Independent	69	69%
Dependent	31	31%

Source: Own elaboration

Figure 1 shows the variance retained by the dimensions in a preliminary analysis. It can be seen that the first two dimensions are highlighted in terms of retained variance. Therefore, we assume an MCA solution that addresses the two dimensions.

Figure 1: Graphical representation of the dimensions variance
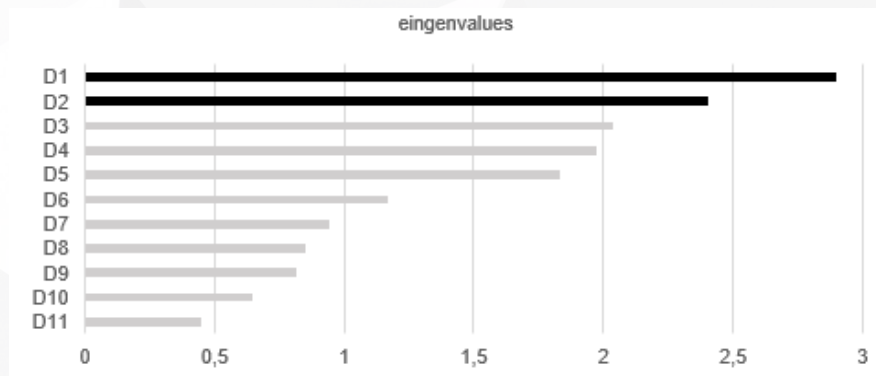
Source: Own elaboration

The table 4 examines the reliability (to check if there is a reasonable consistency) and how the variables discriminate in the two dimensions. The most relevant active variables for each dimension are the ones that have the highest discrimination measures. It can be seen that both dimensions present acceptable internal reliability results (Cronbach's $\alpha > 0,60$).
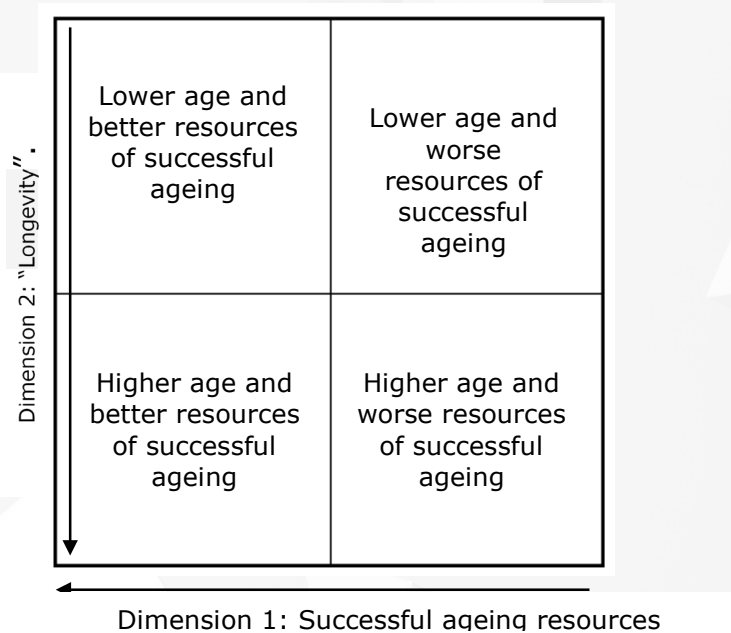
Table 4: Reliability of dimensions and measures of discrimination

	Dimension 1	Dimension 2
α Cronbach	0,695	0,620
Inertia	0,247	0,216
Discrimination Measures		
Psychological Well-being (Ryff)	0,184	0,044
Cognitive Performance (MMSE)	0,001	0,135
Group	0,015	0,012
Lubben Social Network	0,456	0,345
Education (years)	0,153	0,184
Age Groups	0,452	0,668
Gender	0,120	0,075
Independency Level	0,359	0,070

Source: Own elaboration

From the discrimination measures (which quantify the variance of each variable in the dimensions), it can be verified that the variables, psychological well-being, social network and dependency level discriminate more in the first dimension. It has therefore assumed the name of «resources for successful ageing». In turn, the second dimension is characterized by a high discrimination of the variable «age groups», reason why this dimension was renamed «longevity». The level of education presents similar discrimination values in both dimensions.

Figure 2: Description of the graphic space

Dimension 2: "Longevity".

Lower age and better resources of successful ageing	Lower age and worse resources of successful ageing
Higher age and better resources of successful ageing	Higher age and worse resources of successful ageing

Dimension 1: Successful ageing resources

Source: Own elaboration

In order to project MCA as a social space it is necessary to know the meaning of each dimension and the direction of the coordinates on each axis of the graph. With this information we can proceed to the projection of the categories in a known social space, structured both by the respondent's availability for successful ageing resources and the advance of the longevity (Figure 3).

Figure 3: Joint category plot

Dimension 1: Successful ageing resources
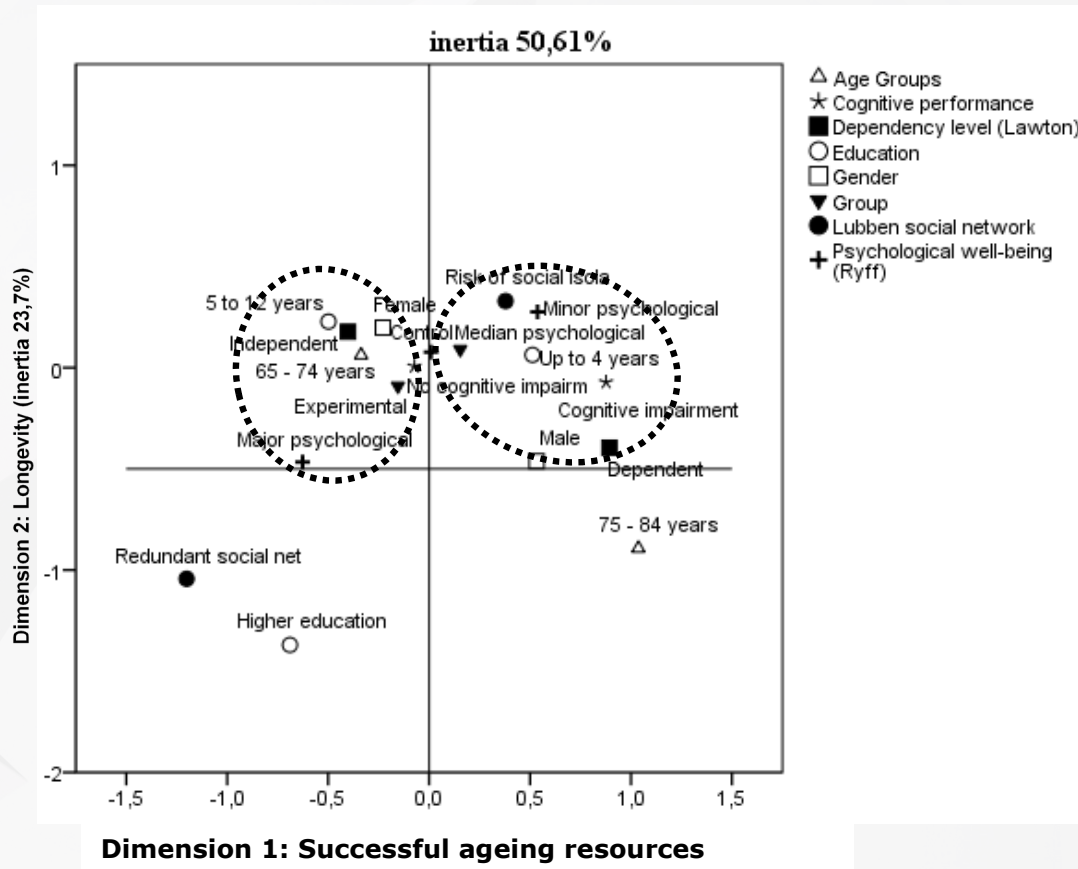
Source: Own elaboration

Two agglomerations of distinct categories were identified in successful ageing resources and with little age variation. The category of the elderly people participating in sports activities promoted by the local authority (intervention group) is highlighted in a quadrant of higher resources for successful ageing and its proximity to the categories of independence in instrumental activities and greater psychological well-being. It has also been found that the female gender is included in this net of categories favouring successful ageing. On the opposite side it is clear that the elderly people not participating in sports activities promoted by the local authority (comparison group) is situated in a quadrant of lower resources for successful ageing, which provides a new cluster of categories related to the risk of social isolation: lower psychological well-being and higher dependency level in the instrumental activities.

5. DISCUSSION AND CONCLUSIONS

The elderly people participating in sports activities promoted by the local authority (intervention group) is less socially favoured comparatively to elderly people not participating in sports activities promoted by the local authority (comparison group) with respect to their household monthly income, marital status, level of education and type of propriety. It indicates a greater adherence to the local authority programmes by the intervention group, filling possible shortages of resources to reach successful ageing. This finding may represent an indicator of the democratizing potential of local authority programmes in the access and promotion of successful ageing, in line

with the recommendations of the World Health Organization (2012; 2015a) and the United Nations Economic Commission for Europe & European Commission (2015). Other studies point out the importance of economic and social resources (Cockeram, 2007; Afonso, 2017), as well as the importance of schooling to reduce the risk of premature death and disability during the aging process (WHO, 2002; Geib, 2012; Cavalcanti *et al.*, 2018). Similarly, Villaverde Cabral *et al.*, (2013) reinforce this idea by demonstrating that social determinants influence the quality of ageing when they find evidence that poor schooling, lower classes, and lower income levels are more related to disability due to illness in the elderly. The International Longevity Centre Brazil (2015) also argues that access to information is a vital element for aging, capable of influencing well-being, employability, intergenerational solidarity and prosperity in general.

In turn, it is important to highlight the high risk of social isolation (76%) found in the entire sample under study. Participating in social activities leads to better life satisfaction and self-esteem (Michèle *et al.*, 2017) and reduces depressive symptoms (Hajek *et al.*, 2017; Michèle *et al.*, 2017) in elderly people. Adams *et al.*, (2011) verify that diverse types of activities generate benefits in aging, highlighting the social activities that can reduce the risk of social isolation, favor socio-emotional support and social roles, among others. In turn, physical activity is associated with a better quality of life (Bastos *et al.*, 2020), and its gains go beyond the exercise itself, encompassing the social dimension, the strengthening of ties and the occupation of a relevant role in community life (Costa *et al.*, 2018; Dias *et al.*, 2014). The importance of being socially involved also deserves to be highlighted in Public Policies oriented to active aging (World Health Organization, 2002; International Center for Longevity Brazil, 2015).

Regarding the concept of well-being, Ryff (1989a; 1989b; 2014) calls attention to aspects of positive functioning as significant involvement in life, achievement of personal talents and abilities and self-knowledge. According to the author, psychological well-being comprises several facets: self-acceptance, positive relationships with others, autonomy, comparison of the environment, purpose in life and personal growth. The author presents evidence of psychological well-being as a protective effect on health (Ryff, 2014), as well as the results obtained in this study.

It should be recalled that these results refer to the municipality of Bragança, a geographical reality quite affected by population aging and depopulation with an aging index, in 2019, of 219,4 (PORDATA, 2020). We understand that the sports activities programmes promoted by the municipality of Bragança, among the elderly population, meet the Territorial Cohesion agenda (UMVI, 2017) whose priorities for these territories are, among others: adapting services to the demographic reality, particularly the aging population.

The ageing population is creating pressures on social and health care services, which are reflected in a greater demand for differentiated services. The response could be through the reallocation of resources and a priority of investment in successful ageing programmes that strengthen social support and the well-being of elderly at risk of social isolation. At the same time, to create opportunities which remodel the supply of public services and qualified employment in the interior territories (UMVI, 2017).

Given the complexity and multidimensionality of successful ageing as an object of study, MCA proved to be a fruitful methodological option. Previously there have been approaches to MCA that project indicators of successful ageing in these age groups (Bijleveld & Kamp, 1998; Coen-

ders *et al.*, 2002; Masuy, 2011; Silva & Aurea, 2013; Avolio *et al.*, 2013; Costa *et al.*, 2013) but few approaches make possible of considering the perceptual map of the MCA, a social space where dimensions assume a denomination and discrimination that allow us to clearly understand the positioning and the meaning of the categories coordinates. This possibility was assumed in this MCA, not only as a multivariate statistical methodology that captures the cross-effect of the determinants for successful ageing, but also as a diagnostic tool for local authority community programmes that promote this kind of ageing.

In short, based on the empirical evidence verified through this MCA it was possible to verify that the respondent population included in the «Active Bragança» and «Desporto Sénior Meio Rural» programmes have better cognitive function, greater psychological well-being and are more independent. Preventing functional decline associated with physical activity was demonstrated by Preto el al., (2016), Garcia *et al.*, (2019) and Costa *et al.*, (2018), just as participation in the community intervention programmes was associated with better quality of life (Bastos *et al.*, 2020; Hajek *et al.*, 2017; Michèle *et al.*, 2017; Ribeiro *et al.*, 2017).

The proximity between categories indicated an association between the category of the intervention group and categories associated with successful ageing. The results obtained have direct implications on the policies for support and well-being of the elderly, in line with that indicated by Rowe & Kahn (1997; 1998; 2015). It seems that the successful ageing programmes under study in this analysis provide the resources of successful aging, for a quality ageing process, improving cognition, social network, independence and psychological well-being.

Longevity as a civilizational achievement and an important indicator of successful aging, a dimension two of the study and representative in the results obtained, calls for collective and individual efforts to increase well-being in the decades of life usually referred to as old age.

The study presents pertinent results for the advances in the scientific knowledge about the successful aging, but that could eventually be potentiated considering some aspects that are pointed as a form of suggestions for future investigations, attending the main identified limitations. The sample size, reduced to generalize results, although it was constituted randomly, however the transversal nature of the study may limit the causal explanation.

Increasing the sample size while maintaining the random sampling procedure and a longitudinal design may increase the potential of this study and simultaneously increase the chances of obtaining statistically more robust results that corroborate those found, as well as others that complement them. A longitudinal study will allow the establishment of a coherent sequence of data collection.

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