Characteristics of successful aging of older adults in Nuevo Leon

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Abstract

Objective: The objective of this study was to know the characteristics of older adults with successful aging (SA) in the state of Nuevo León. **Materials and methods:** A descriptive, cross-sectional, survey-type study, in a population of 240 adults over 65 in the state of Nuevo León, of both sexes being patients or patient companions, Outpatient Clinic of the University Hospital, and the lower floor of the City Hall of Monterrey and older adults in the EGADE Business School. **Results:** We found a high percentage of SA in older adults sampled in the state of Nuevo Leon. SA was found in patients without cognitive impairment (odds ratio [OR] 3.5, 95% confidence interval [CI 95%] 1.9-6.3), in retirees (OR 2.9, 95% CI 95% 1.5-5.3), in healthy patients or companions (OR 2.1, CI 95% 1.0-4.3), male (OR 2.5, CI 95% 1.3-4.6), and high schooling interviewees (OR 4.6, CI 95% 2.0-10.7). In general, 57.9% have no cognitive impairment, according to Mini-Mental State Examination. **Conclusions:** We found SA in 50.9% of patients and 66.1% in apparently healthy companions. The absence of cognitive impairment, high school, male sex, and being retired from an institutional system, is associated with SA in adults over 65 years. The prevalence of SA in this sample was higher than that found in other studies.

Key words: Successful aging. Active aging. Healthy aging. Elderly. Successful aging index.

Introduction

The demographic transition in Mexico, which has been called the aging phenomenon, represents a significant challenge for the health sector since this type of population will require specific attention¹.

In Nuevo Leon, in 2015, according to the National Institute for Older Persons (INAPAM acronym in Spanish), those 60 years old or more represent 8.9% of the total population². The population phenomenon has developed due to a reduction in mortality and a decrease in the birth rate³.

Aging generally implies a loss of function, higher morbidity, etc. Nevertheless, there can be a successful aging (SA) process. Several terms have been used as a

synonym for SA including healthy, active, productive, optimal, or positive aging. However, a more generalized definition focuses on the functioning of everyday life and physical health⁴.

This aging process depends on several genetic, biological, social, and psychological conditions⁵, making it an individual phenomenon. The consensus among authors is that the determinants of SA are potentially multifactorial, although research usually reduces them to lifestyles⁴, physical activity, and the absence of drug addiction⁶ and also the development of good eating habits⁷, occupations⁸, social participation⁹, and social support¹⁰. Therefore, they have a low probability of getting sick and disabled associated with a disease, a high cognitive and physical functionality, and a commitment to life^{3,5,11,12}.

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In the same track, some other authors like Ballesteros et al. have identified the predictive factors of aging among individuals are sociodemographic, higher income, better education, regular physical activity (among these, the most important variables were strength and lung capacity), and psychological characteristics related to intelligence, personality, and motivation, among others⁴. Among those, physical activity and social activation were demonstrated as very important factors in the prevention of anxiety and late depression¹³.

The reason for conducting this research is to know the profile of older adults who present SA and has an idea about the prevalence of the phenomenon in our state. This would be the first advancement in knowledge regarding this population to subsequently study the factors associated with SA to correct those factors that prevent it or strengthen those that favor it.

Materials and methods

This was a cross-sectional, descriptive survey of elderly population of the state of Nuevo Leon. We included adults over 65 years of age of both sexes. They were approached in the Outpatient Clinic of the University Hospital, on the ground floor of the City Hall of Monterrey during a weekend folk festival, and in the EGADPE private postgraduate business school of the Tec de Monterrey. We excluded those who did not want to participate and those with evident cognitive impairment (CI) or with some incapacitating psychiatric illness.

A convenience sample was used in the mentioned study sites as long as individuals met the inclusion criteria. For the estimation of sample size, a formula for epidemiological studies was used, reaching a final sample of 240 participants.

An instrument was designed that consisted of (I) demographic data, age, sex, education, and socioeconomic level measured by the AMAI scale¹⁴ and (II) the SA index (SAI) for measuring SA. The SAI was designed by Theodore D. Cosco¹⁵, and it consists of 20 items that use operational definitions. This tool was used because it incorporates both objective physiological measures and subjective psychosocial measures of SA. Those components were based on the Katz Index, the Lawton and Brody scale^{16,17}, and the Folstein Mini-Mental State (Mini-Mental State Examination [MMSE])¹⁸. Besides, some items related to the older person's perception of their future, their health and loneliness, were included in the study. The SAI was created using a protocol similar to the fragility index, based on the number of possible answers. Values were

assigned, fractional, for example, for a Likert-type response of four answers. The response corresponding to the highest level of function would receive 100, the next 67, 33, and finally 0 for the lowest possible level. For continuous variables, for example, MMSE, previous cutoff points: ≥ 26 , 25-22, 21-18, and 17-0 with fractional values were used, according to the protocol used in Searle et al. This scale has a predictive validity in the English population, where values of the area under the curve and the receiver operating characteristics curve fluctuated between 0.65 and 0.86¹⁵.

After obtaining prior informed consent, the participant was invited to answer the instrument in a private area, where the questionnaire was completed in approximately 10 min. The instrument was applied by two of the authors (PABH, AMRG), after training. No economic stimulus was offered for participation in the survey.

Statistical analysis

The data were captured with SPSS version 20 for Windows and analyzed with descriptive statistics for percentages and frequencies of categorical variables, and means and standard deviations for continuous variables.

According to the Kolmogorov–Smirnov test, the distribution of the data was not normal, so the score obtained on the SAI was established as successful and unsuccessful aging according to the median. The SA variable was cross-referenced with the demographic and socioeconomic data using Chi-square with $p < 0.05$.

The level of education was recorded as low, those from the 2nd year of junior high school and lower (21 points and less for individuals with CI, and 18 and less for illiterate individuals) and high, those from the 3rd year of secondary school and higher, according to the years of the study^{3,19}.

Ethical considerations

The protocol was approved by the Ethics and Research Committees of the University Hospital.

Results

A total of 240 older adults were studied with a general prevalence of SA of 62.5% (Fig. 1). Of these, 141 were female (58.8%) with a mean age of 71.7 ± 5.7 . Males were 99 (41.2%) with a mean age of 73.8 ± 6.4 . Education prevailed until complete primary school (68.7%); in marital status, 56.3% were married, and in religion,

Figure 1. Percentage of successful aging.

80.4% were Catholics. The majority was not receiving a retirement pension (Table 1). Of the group, 75% suffered some disease, especially chronic degenerative diseases alone or in a multimorbid pattern (Table 2).

Of the study population, 50.9% of the patients and 66.1% of the respondents who correspond to non-patients or companions showed scores corresponding to SA ($p < 0.05$). We found an association of SA with male sex patients, high level of education, retired, healthy participants, as well as those without CI (Table 3).

Discussion

In this study, the prevalence of SA was high considering the types of populations studied: we included patients from an Outpatient Clinic of Family Medicine of a University Hospital, the companions of patients (apparently healthy), with a higher prevalence of SA in the latter population but above all groups of older adults belonging to a very high socioeconomic area (municipality of San Pedro Garza Garcia).

In general, the results of activities of daily life by older adults could be performed without difficulty with an average percentage higher than 80%; therefore, the degree of independence was quite good given that the participants moved to place inside and outside of the hospital, and even participated in activities such as dancing (City Hall of Monterrey).

This prevalence of SA was higher than that reported by Ballesteros (15.5-41.4%), in Madrid, Spain, using a similarly diverse subpopulation; i.e., rural population, university students, and volunteers, with a mean age of 66 years, and notably, those who were independent to carry out daily life activities which could determine a higher SAI score⁴.

On the other hand, Carrasco et al. reported a prevalence of 40.4% in patients from a general hospital in Colima, Mexico²⁰; this was lower than that found in this

Table 1. Sociodemographic data of older adults

Variable	Frequency	Percentage
Gender		
Male	99	41.2
Female	141	58.8
Education		
Illiterate	21	8.7
Incomplete elementary	96	40.0
Complete elementary	48	20.0
Incomplete junior high	15	6.3
Complete junior high	22	9.1
High school	13	5.4
Bachelor's degree	19	6.7
Postgraduate	9	3.8
Marital status		
Married	135	56.3
Single	19	7.9
Divorced/separated	24	10.0
Widowed	62	25.8
Religion		
Catholic	193	80.4
Christian	19	7.9
Jehovah's witness	6	2.5
None	12	5.0
Other	10	4.2
Occupation		
Housewife	82	34.2
Small business	19	7.9
None	71	29.6
Other	68	28.3
Remunerated occupation		
Yes	61	28.8
No	71	71.2
Retired		
Yes	98	40.8
No	142	59.2

study. This could be due to the socioeconomic level of the population surveyed in Nuevo Leon, one of the industrial states of the country, obviously with a higher living standard than Colima state.

In general, the sample in this study is a population with a low level of education (75%); they could be non-retirees (59.2%). However, the sample study included more retired persons than in the general population given that in Nuevo Leon; 9.8% of no economically active population are retired, and in general, a little $< \frac{1}{2}$ were not economically active population²¹. SA is more associated with retirees than non-retirees; this could explain the higher prevalence of SA than in other studies⁴.

Other considerations should be born in mind regarding the comparison of the prevalence of SA, such as there is not a single, conventional scale to measure SA.

Table 2. Medical and institutional data of older adults

Variable	Frequency	Percentage
Healthy	60	25.0
Ill	180	75.0
Type of disease		
HT	47	19.6
DM2	32	13.3
HT, DM2	28	11.7
Three or more diseases (including DM and HT)	15	6.3
Other	118	49.1
Medical service		
Institutional	212	88.3
Private	14	5.8
None	14	5.8
Institutional service		
IMSS	96	40.0
ISSSTE	7	2.9
SSA/SP	100	41.7
Other	37	15.4

Table 3. Variables associated with successful aging

Variable	OR	95% CI
Without cognitive impairment	3.5	1.9-6.3
Retired	2.9	1.5-5.3
Healthy or accompanying	2.1	1.0-4.3
Men	2.5	1.3-4.6
High education level	4.6	2.0-10.7

OR: odds ratio.

Furthermore, it varies according to the elements that are part of the instruments, for example, Carrasco et al.²⁰ used the Barthel index ≥ 90 and the Pfeiffer test with two or more errors; in this study, we used Cosco's SAI¹⁵.

On the other hand, it has been shown that the educational level has an impact on SA³. This coincides with our research that significantly showed more SA in people with high education compared to those with low education.

In addition to the aforementioned factors of high income and education, there are other predictive factors associated with the SAI⁴, which are not all considered in the current SAI scale. For instance, Ryff's theory on SA includes six criteria such as self-acceptance, personal growth, autonomy, positive relationships with others, control over their environment, and the meaning of life, which do not occur simultaneously in the stages of

life²². On the other hand, Rowe defines SA as a low probability of illness or of acquiring a disability, a high physical and cognitive capacity, and high social participation⁴.

Few studies have associated cognitive impairment with SA. In this study, it was found that an MMSE score higher than 24, 74.8% would correspond to people with SA. This is higher than that found by Ballesteros, who reported a prevalence of SA of 46% but with an MMSE cutoff point of 29.

A higher cognitive level has been identified in people with SA compared to those who do not have this^{5,23}. That is, the absence of CI was associated with more SA, which is not surprising since a proper cognitive function is related to the quality of life²⁴, and in contrast, a cognitive deficit with greater fragility (odds ratio 3.2; CI: 2.0-5.1; $p < 0.0001$)²⁵.

Limitations

The most significant limitation of the study was the sampling method, which was not probabilistic and did not ensure the probability of selecting an absent or poorly accessible population. However, it was attempted to address diverse populations in a socioeconomic stratum, educational level, and different levels of independence and health.

Another limitation is the wide variety of instruments for measuring SA. In this case, Cosco's SAI does not consider all the variables mentioned by other authors as components of the SA construct or active aging.

Conclusions

A high prevalence of SA was found in the study population, compared with other studies, which could be explained by the kind of studied population.

SA in adults over 65 years is associated with the absence of cognitive impairment, a high education level, male sex, and being pensioned from an institutional system.

Conflicts of interest

The authors declare that they have no conflicts of interest related to this research.

Ethical disclosures

Protection of human and animal subjects. The authors declare that no experiments were performed on humans or animals for this study.

Confidentiality of data. The authors declare that they have followed the protocols of their work center on the publication of patient data.

Right to privacy and informed consent. The authors have obtained the written informed consent of the patients or subjects mentioned in the article. The corresponding author is in possession of this document.

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