




## Quality of life of participants in a fall prevention program in the city of Maceió

### Qualidade de vida de participantes de um programa de prevenção de quedas no município de Maceió

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**ABSTRACT | INTRODUCTION:** Social, psychological, physical, and environmental factors, associated with the functional impairment resulting from aging, can interfere with the quality of life of the aging individual. **OBJECTIVE:** To evaluate the quality of life of participants in a fall prevention program in the city of Maceió. **METHODS:** This is an observational, cross-sectional study carried out with data from participants in a fall prevention program in the city of Maceió, which included all participants aged 60 or over, who underwent the assessment before the start of interventions and had their data recorded in the medical records, excluding those who did not complete the entire evaluation or had errors in the records and those who presented cognitive impairment according to the Mine mental status exam. Data related to socioeconomic and demographic characteristics (age, sex, education, salary income, and participation in elderly groups) were analyzed; health data (number of associated diseases, physical activity, health perception, and history of falls) and quality of life assessment, measured by Whoqol-bref. To elucidate the influence of the various variables on the Whoqol-bref domains, multivariate linear regression analyzes were performed. **RESULTS:** The final sample was 66 elderly (70.28 ± 9.2), with a predominance of females 54 (81.8%). The means of the four domains were similar, with superiority for the psychological. There was a significant association between the Whoqol total score and good perception of health ( $p < 0.01$ ) and education ( $p < 0.06$ ); between the environmental domain and functional repercussions after falling ( $p < 0.01$ ) and education ( $p = 0.04$ ); between the physical domain and good health perception ( $p < 0.01$ ), number of diseases ( $p = 0.03$ ) and physical activity ( $p = 0.02$ ); between the psychological domain and good perception of health ( $p < 0.01$ ) and education ( $p = 0.04$ ). **CONCLUSION:** The quality of life of the participants showed a balance between the physical, psychological, social, and environmental domains, being superior in the psychological domain. It was associated with factors such as the good perception of health, education, physical activity, number of associated diseases, and the presence of functional repercussions after a fall.

**KEYWORDS:** Aged. Quality of life. Accidental Falls.

**RESUMO | INTRODUÇÃO:** Fatores sociais, psicológicos, físicos e ambientais, associados ao comprometimento funcional decorrente do envelhecimento, podem interferir na qualidade de vida do indivíduo que envelhece. **OBJETIVO:** Avaliar a qualidade de vida de participantes de um programa de prevenção de quedas na cidade de Maceió. **MÉTODOS:** Trata-se de um estudo observacional, de corte transversal, realizado com os dados dos participantes de um Programa de prevenção de quedas da cidade de Maceió, onde foram incluídos todos os participantes com 60 anos ou mais, que realizaram a avaliação antes do início das intervenções e tiveram seus dados registrados nos prontuários, sendo excluídos aqueles que não completaram toda a avaliação ou apresentavam erros de registros e os que apresentaram alteração cognitiva segundo o Mine exame do estado mental. Foram analisados os dados referentes as características socioeconômicas e demográficas (idade, sexo, escolaridade, renda salarial e participação em grupos de terceira idade); dados referentes à saúde (número de doenças associadas, prática de atividade física, percepção de saúde e histórico de quedas) e à avaliação da qualidade de vida, mensurada pelo *Whoqol-bref*. Para elucidar a influência das diversas variáveis sobre os domínios do *Whoqol-bref* realizaram-se análises de regressão linear multivariada. **RESULTADOS:** A amostra final foi de 66 idosos (70,28 ± 9,2), com predominância do sexo feminino 54 (81,8%). As médias dos quatro domínios foram semelhantes, com superioridade para o psicológico. Houve associação significativa entre o escore total do *Whoqol* e boa percepção de saúde ( $p < 0,01$ ) e escolaridade ( $p < 0,06$ ); entre o domínio ambiental e repercussão funcional pós queda ( $p < 0,01$ ) e escolaridade ( $p = 0,04$ ); entre o domínio físico e boa percepção de saúde ( $p < 0,01$ ), número de doenças ( $p = 0,03$ ) e prática de atividade física ( $p = 0,02$ ); entre o domínio psicológico e boa percepção de saúde ( $p < 0,01$ ) e escolaridade ( $p = 0,04$ ). **CONCLUSÃO:** A qualidade de vida dos participantes apresentou equilíbrio entre os domínios físico, psicológico, social e ambiental, sendo superior no domínio psicológico. Associou-se a fatores como boa percepção de saúde, escolaridade, prática de atividade física, número de doenças associadas e presença de repercussão funcional pós queda.

**PALAVRAS-CHAVE:** Idoso. Qualidade de vida. Acidentes por Quedas.

## Introduction

The change in the demographic profile of the population in recent years is apparent through the inversion of the age pyramid, especially in developed and developing countries, where there is evidence of an increase in the elderly population, due to a decline in the birth rate and mortality, in addition to scientific advances in health care<sup>1</sup>.

However, longevity is not synonymous of aging with quality of life; because although aging is a dynamic, progressive and physiological process, it implies morphofunctional changes in the body, which makes it more susceptible to intrinsic and extrinsic aggressions, which can lead to a prolongation of life accompanied by physical, psychological and social comorbidities, being able to predispose the elderly to chronic diseases and geriatric syndromes<sup>2</sup>.

The association of these diseases and syndromes intensify the decrease in the functional capacity of the elderly, and trigger, mainly, changes in strength and balance. Among these processes, postural instability stands out, which leaves the elderly susceptible to falls<sup>3</sup>.

These problems directly affect the health and functional independence of the elderly person, and consequently their quality of life, as they decrease the ability of the elderly person to perform their basic and instrumental activities of daily living<sup>4</sup>.

The concept of quality of life is broad and can be related to personal well-being, functional capacity, socioeconomic status, emotional status, family support, social participation, self-care, health status, intellectuality, cultural, ethical and religious. That is, aging with quality of life presupposes a multidimensional concept that is subjective, and varies according to the individuality of each person, within their context of life, goals, expectations and achievements<sup>5,6</sup>.

So, the maintenance of good health standards, as well as the participation of the elderly in the social

environment, allowing them to perceive their insertion and importance in society, predisposes the individual to a healthy aging process, in the full sense.

Therefore, actions aimed at promoting active aging, based on studies that evaluate and improve them, become increasingly relevant. Through them, it is possible to encourage autonomy, independence, self-expression and social reintegration in search of a successful and quality old age<sup>7</sup>.

Within this context, and understanding that the fall event interferes negatively in the elderly's quality of life, fall prevention programs appear to contribute in this aspect, also aiming at preventing new episodes by stimulating functional capacity.

Thus, it is relevant to carry out studies that evaluate the quality of life in participants in fall prevention groups, to identify possible changes in this parameter, and, therefore, suggest proposals to expand the dissemination to those who are not included in them.

So, the present study aimed to assess the participant's quality of life in a program to prevent the risk of falls in the city of Maceió, Alagoas, as well as to analyze the factors associated with quality of life, for each of the domains related to it (physical, psychological, social and environmental).

## Methods

This is an observational study with a quantitative, descriptive and analytical approach, cross-sectional, conducted in the city of Maceió, Alagoas, using data from the elderly linked to the ambulatory for prevention of falls at Santa Casa de Misericórdia de Maceió. The research was carried out with data from the participants that were evaluated in the period from 2014 to 2016. This article is a research arm of the umbrella project entitled Multidimensional evaluation of the effectiveness of a fall prevention program in the elderly: a guard project rain.

All participants aged 60 years or older, who performed the evaluation before the start of the interventions and had their data recorded in the medical records were included, excluding those who did not complete the entire evaluation or had errors in records, and those who presented cognitive impairment according to the Mine mental status exam, considering the cutoff point of 18 for illiterates, 24 for those with up to 4 years of study and 26 for those with more than 4 years of study.

The research protocol had the project approved by the Ethics and Research Committee of Centro Universitário Cesmac under the protocol number 1669-12.

The data collection was carried out at the ambulatory, directly in the medical records of the elderly, and the information collected was recorded on a previously prepared data collection form. For this research, all the elderly who participated in the project were included, comprising evaluations from May 2011 to November 2012.

To participate in the project, individuals must be 50 years age or older, being referred by health professionals or by their own registration. For the study presented here, the data analyzed were only for participants aged 60 years or over.

The project happens once a week, in the afternoon, with interventions carried out in groups of a maximum of 8 individuals. The intervention lasts two hours and is divided into two moments, with one hour each.

Initially, the participants attend lectures with themes aimed at preventing falls, given by professionals from the interdisciplinary team of Geriatrics and Gerontology (geriatrician, physiotherapist, psychologist, nutritionist, social worker, nurse, physical educator, occupational therapist and speech therapist). Then, they are directed to another room where a group intervention takes place with the responsible Physiotherapist who proposes exercises aimed at balance training and cognitive stimulation.

The project lasts for four months. All participants pass through a multidimensional evaluation at the

beginning of activities, where all socioeconomic and demographic data are collected and assessed: health perception, cognitive assessment, mood, quality of life, functional capacity, balance and mobility and fear of falling. The same assessment is repeated at the end of the activities.

For this article, a cross-sectional approach of the data from the initial evaluation of the project was carried out and the socioeconomic and demographic data and questions related to the quality of life were analyzed, referring to the World Health Organization Quality of Life - WHOQOL-BREF questionnaire.

The WHOQOL-BREF is the World Health Organization's quality of life questionnaire, being an instrument validated in Brazil, short and self-administered. It consists of 26 questions divided into four domains: physical, psychological, social relations and the environment. For each aspect of quality of life contained in the questionnaire, the individual can present answers through scores ranging from 1 (one) to 5 (five), with the worst condition in score 1 (one) and the best in score 5 (five). The results of the domains present values between 0 (zero) and 100 (one hundred), the worst being those closest to 0 (zero) and the best, those closest to 100 (hundred)<sup>8</sup>.

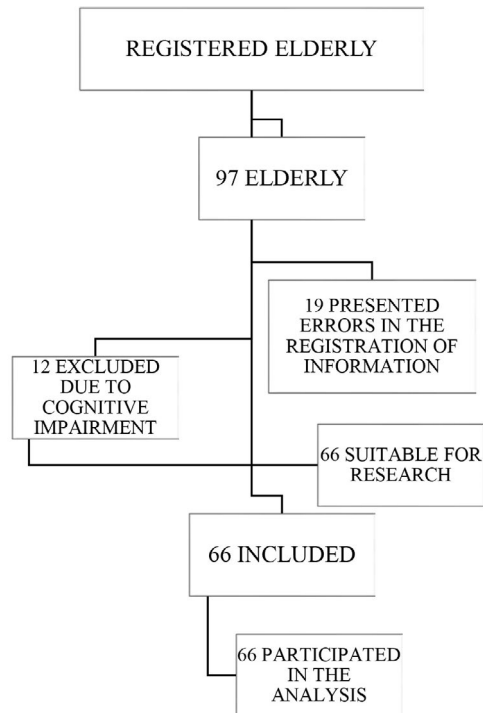
The database was created using the Excel® 2003 program (Windows® environment), and the analysis was performed using the SPSS® (Statistical Package for Social Sciences) statistical package, version 15.0.

To elucidate the influence of the various socioeconomic variables on the scores of the four different domains of the WHOQOL and its general mean, the multivariate linear regression analyzes were performed. To this end, the scores in the psychological and physical domains were first transformed (reversion followed by square root) to meet the assumption of normality. After that, five multivariate linear regression analyzes, with step-by-step input mode, were conducted to identify the model that best explained the variation in the scores of the 4 domains and the overall average. The correlation assessment in the models was performed using the Durbin-Watson test and the predictive capacity of the models through the adjusted R<sup>2</sup> values.

## Results

The present study consisted of a final sample of 66 participants (Figure 1) where the average age was 70.28 years (SD = ± 9.2). There was a predominance of females, 54 (81.8%) and a significant proportion of high schooling, with an average of 8.8 years of study (SD = ± 5.82), 30 (45.5%) had more than 9 years of study, and 18 (27.3%) had between 4 and 9 years of study, and, in the same proportion, 18 (27.3%), had less than 4 years of study. Data on socioeconomic aspects show that the majority are retired, corresponding to 55 (88.3%) of the total elderly. Likewise, 34 (51.5%) had an income of one minimum wage, and the rest, 32 (48.5%) reported an income greater than a minimum wage, and 30 (45%) stated that they participated in socialization activities in some elderly group.

**Figure 1.** Flowchart of collection of participants in a program to prevent the risk of falls in the city of Maceió, Alagoas. 2014 to 2016



Concerning health-related aspects, the studied population had a high number of associated comorbidities, where the majority, 41 (62.1%) reported having more than three diseases, with an average of 2.51 comorbidities (SD = ± 0, 68). With regard to the practice of physical activity, 40 (60.6%) reported not practicing any type of physical activity, and 53 (80.3%) perceived their health as good when assessing the perception of their health status. Most of the evaluated individuals reported having fallen in the last year, with an average of 1.48 falls (SD = ± 1.8), ranging from none to ten falls, and 55 (83.3%) did not present any type of functional repercussion after the fall event.

About the results of the quality of life assessment, similar averages were observed for all domains, with the highest average found in the psychic domain and the lowest in the physical domain (Table 1).

**Table 1.** Distribution of Quality of Life averages by domains according to Whoqol-Bref. Maceió

Domain	Average	Median	Standard Deviation	Minimum value	Maximum value
Physical	60,25	66,07	20,05	7,14	92,86
Psychic	65,72	66,66	17,53	16,67	95,83
Social	64,59	75	16,89	33,3	100
Environmental	60,88	62,5	14,28	31,25	100
Total	65,36	67,02	12,99	30,69	93,79

Source: The authors (2021).

The multivariate linear regression analysis showed that the model consisting of the individuals' current health status and years of schooling was the one that best explained the variation in the total WHOQOL scores (Adjusted  $R^2 = 0,268$ ; Durbin-Watson = 2,01;  $F = 12,14$ ;  $SD < 0,001$ , (Table 2).

**Table 2.** Multivariate model that best explains the variation in WHOQOL General

Model	Coefficients			CI95%	
	B	Standard Error	SD	Inferior Limit	Superior Limit
(Constant)	36,63	6,5	<0,01	23,61	49,65
Good perception (Health)	12,37	3,5	<0,01	5,34	19,4
Schooling	0,714	0,25	0,06	0,21	1,21

Source: The authors (2021).

Table 3 describes the results of the multivariate linear regression analysis for the environmental domain and showed that the model consisting of years of schooling and the presence of functional repercussions was the one that best explained the variation in the scores for this domain ( $R^2$  Adjust. = 0; Durbin-Watson = 2,22;  $F = 6,69$ ;  $SD = 0,02$ ).

**Table 3.** The multivariate model that best explains the variation in the Environmental domain (WHOQOL)

Model	Coefficients			CI95%	
	B	Standard Error	SD	Inferior Limit	Superior Limit
(Constant)	55,17	3,38	<0,01	48,40	61,95
Schooling	0,792	0,295	<0,01	0,201	1,383
Functional Repercussion	-8,95	4,41	0,04	-17,79	-0,113

Source: The authors (2021).

For the analysis of the physical and psychological domains the interpretation of inverse or direct association must be interpreted in reverse (signs of positivity must be interpreted as negativity, and vice versa) because for the variables to present a normal distribution, the data of these domains were transformed (reverse values).

The multivariate linear regression analysis showed that the model consisting of the individuals' current health status, the practice or not of physical activity and the number of diseases, was the one that best explained the variation in the scores of the WHOQOL Physical domain ( $R^2$  Adjust. = 0,344; Durbin-Watson = 1,96;  $F = 11,646$ ;  $SD < 0,01$ ; Table 4).

**Table 4.** The multivariate model that best explains the variation in the Physical Domain (WHOQOL)

Model	Coefficients			CI95%	
	B	Standard Error	SD	Inferior Limit	Superior Limit
(Constant)	7,75	1,12	<0,01	5,50	10,0
Good perception (health)	-1,73	0,47	<0,01	-2,68	-0,78
Number of diases	0,85	0,39	0,03	0,05	1,64
Practice Physical Activity	-1,23	0,393	0,02	-2,05	-0,47

Source: The authors (2021).

Table 5 shows the results of the multivariate linear regression analysis for the psychological domain, showing that the model consisting of the individuals' current health status and years of schooling was the one that best explained the variation in the scores in this domain ( $R^2$  Adjust. = 0,207; Durbin-Watson = 1,64;  $F = 8,954$ ;  $SD < 0,001$ ).

**Table 5.** The multivariate model that best explains the variation in the Psychological Domain (WHOQOL)

Model	Coefficients			CI95%	
	B	Standard Error	SD	Inferior Limit	Superior Limit
(Constant)	8,69	0,85	<0,01	6,98	10,39
Good perception (health)	-1,52	0,46	<0,01	-2,44	-0,60
Schooling	-0,06	0,03	0,04	-0,13	-0,002

Source: The authors (2021).

Linear regression analysis showed that no constructed model was able to adequately explain the variation in scores in the social domain.

## Discussion

The analysis of the study data presented here showed a balance between the domains of quality of life evaluated, with the psychological one being slightly superior to the others. The quality of life was associated with several factors, and these relationships change depending on the domain analyzed.

The findings of this research, as well as in other studies, revealed similar situations with regard to socioeconomic and demographic data found in Brazilian society<sup>2</sup>, where a predominance of the female population was identified, with an average age around 70 years, living with up to one minimum wage.

About education, this factor has proved to be an important social determinant for health outcomes aimed at quality of life. In Brazil, the poorest elderly has worse health conditions and, despite this, use these services less<sup>10</sup>.

Regarding monthly income, the population studied, in general, receives up to one minimum wage. It is noteworthy that, although some studies have shown that low income reduces well-being in the elderly, in the present study, no significant association was found between income and quality of life<sup>10</sup>.

The self-perception of health, on the other hand, was shown to be associated with several domains, this being an outcome researched in several studies with a Gerontological focus, and has proved to be a reliable method for assessing health conditions in the elderly population, being an extremely important parameter, since, the individual who gets older, often refers to health as an important factor for maintaining the quality of life<sup>11</sup>.

In this research, a good perception of health was identified for most of those evaluated, which can also be explained by the high level of education verified in the studied population. Similar data were found in the study by Joia et al.<sup>12</sup> on conditions associated with the degree of satisfaction with life in the elderly population.

The human aging process is physiological and is not characterized by the presence of disease. However, the decrease in functional reserve, characteristic of this phase of life, predisposes the individual to the appearance of associated comorbidities<sup>2</sup>, a fact evidenced in this study, where most of the evaluated subjects presented more than three diseases.

Another relevant fact was the high proportion of physical inactivity, which can be an important factor for the risk of falls, and negatively interfere in the quality of life of individuals. It is noteworthy that regular physical activity has a positive effect on the preservation of bone mass and the association between drug treatment and physical activity is an excellent way to prevent fractures<sup>13</sup>.

Multivariate linear regression revealed a significant association between the general average of the Whoqol-bref with schooling and good perception of health. The assessment of health perception as well as of quality of life are subjective verifications, about how the individual being evaluated perceives himself in relation to these. Thus, the positive variation can be explained, that is, higher values in the average quality of life for the subjects who perceived their health as good. Positive associations were also found between good health perception and the physical and psychological domains, and can also be interpreted in this way.

Regarding education, it was found that with each increase in a year of study, the average quality of life increases, both in the general average and in the environmental and psychological domains. Similar results were found by Pereira et al.<sup>14</sup> and Braga et al.<sup>15</sup> where the authors identified a statistically significant association between poor perception of the quality of life and a lower level of education

For the interpretation of this result, it can be taken into account that lower levels of education are associated with worse health indicators and that a low level of education would also represent fewer opportunities for employment, leisure and social activities<sup>16</sup>, and that interferes negatively in all domains assessed by WHOQOL.

Having functional repercussions after a fall also showed a statistically significant association with the environmental domain, where the presence of functional repercussions leads to a reduction in the means of quality of life in this domain. This relationship shows the influence of the individual's environment on quality of life. In fact, for an individual who has had some kind of functional impairment, he tends to be more concerned with the environment where he lives, highlighting that precarious environmental conditions such as non-adapted housing, deficient infrastructure and situations of violence influence the perception of the quality of life<sup>17</sup>.

It should also be emphasized that an adequate environment for the elderly is one that, in addition to offering security for the elderly, must be functional, enabling the individual to carry out their daily activities with the greatest independence and autonomy possible, while also providing social interaction<sup>18</sup>. The environment has a direct association with the perception of the quality of life among individuals of older age groups because it is directly linked to the prevention of falls, social interaction, functional capacity and general well-being<sup>19</sup>.

For the physical domain, a positive association was identified between good health perception and the practice of physical activity, where there is a tendency to increase the average quality of life; and an inverse association with the number of diseases, where, with each unit, increase in the number of diseases, there is a tendency to decrease in the average quality of life.

The regular practice of physical activity constitutes more vigor and energy for the performance of daily activities. Conte and Lopes<sup>20</sup>, in a study that evaluated the quality of life in elderly women, found that active women obtained better averages in the physical domain, and attributed less pain and more disposition to daily activities.

The inverse association between the largest number of diseases and the physical domain, on the other hand, can be explained by the greater tendency of functional impairment, as the number of comorbidities increases<sup>21</sup>.

Quality of life is influenced by several factors, and in the elderly, more than in other age groups, physical, psychological, social and cultural factors contribute to changes in the perception of this outcome.

Thus, evaluating and promoting the health of the elderly means considering variables from different fields of knowledge, in an interdisciplinary and multidimensional approach<sup>22</sup>.

The limitations of the study presented here are highlighted, mainly because it is a cross-sectional analysis of data. It is suggested that longitudinal studies and research aimed at evaluating the effects of strategies aimed at optimizing the quality of life of the elderly, such as fall prevention programs, should be increasingly implemented since this should be the main outcome and final objective of any health intervention.

## Conclusion

The results of this study revealed similar averages for the four domains of quality of life (physical, psychological, environmental, and social). Good health perception, high schooling, and physical activity were factors that positively influence the quality of life. The post-fall functional repercussions and a greater number of comorbidities, however, show negative influences.

## Author contributions

Rebêlo FL, Santos JCM and Costa JKO participated in the design, search and statistical analysis of the research data, interpretation of results and writing of the scientific article. Lima NFS participated in the writing and review of the scientific article.

## Competing interests

No financial, legal, or political conflicts involving third parties (government, companies and private foundations, etc.) have been declared for any aspect of the submitted work (including, but not limited to, grants and funding, participation in advisory council, study design, preparation of the manuscript, statistical analysis, etc.).

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