





Aging and vulnerability: an analysis of 1,062 elderly persons

Rubia Rosalinn da Cruz¹ 
Vilma Beltrame¹ 
Fabiana Meneghetti Dallacosta¹ 

Abstract

Objective: To analyze the vulnerability of non-institutionalized elderly persons. **Method:** A cross-sectional, descriptive and analytical study was carried out using data of the City Health Department of Palmas, Paraná, Brazil, and the Vulnerable Elders Survey (VES-13) instrument. The questionnaires of people aged over 60 years who had answered the VES-13 questionnaire between January 2016 and December 2017 were included. The quantitative data were analyzed by the Student's T-Test and the categorical data by the Chi-square and Fisher's Exact Test. The correlation between the quantitative variables was performed by the Pearson correlation coefficient. **Results:** A total of 1,062 questionnaires were analyzed, of which 57.3% were female, with a mean age 69 (± 7.8) years. In total 427 individuals (40.2%) were vulnerable and 635 (59.8%) were not vulnerable according to VES-13 score. A total of 635 (59.8%) elderly persons were classified as robust, 176 (16.6%) as at risk of frailty and 251 (23.6%) as frail. Women and those over 75 years were more vulnerable ($p < 0.001$). **Conclusion:** Vulnerability was related to the female sex, age over 75 years and the presence of chronic diseases, with these being the priority groups for the elaboration of intervention strategies in the health of the elderly.

Keywords: Aging. Elderly. Health Vulnerability. Frail Elderly.

¹ Universidade do Oeste de Santa Catarina, Programa de Pós-graduação em Biociências e Saúde. Joaçaba, Santa Catarina, Brasil.

Correspondence
Rubia Rosalinn da Cruz
rrosalinn@gmail.com

Received: November 20, 2018
Accepted: July 23, 2019

INTRODUCTION

Human aging alters the main physiological systems, which makes elderly persons more frail and susceptible to impairment of their physical and functional capacity¹. Although aging is not synonymous with illness, with advanced age, individuals become more vulnerable, and thus have greater social, physical and psychological needs².

Social vulnerability can be understood as multidimensional, affecting individuals, groups and communities in different ways and intensities, and on different levels of their well-being. It results from factors such as retirement, income reduction, discrimination, social and family isolation and a deficiency in public policies to support these elderly persons. As it is considered dynamic, it implies not only income-related poverty, but an understanding of the events that harm social, cultural, political and economic relations. Improving this understanding may contribute to reducing the vulnerability of the elderly, as it is related to the structural factors of society^{2,3}.

There are some gaps in studies on the vulnerability of the elderly in Brazil, partly justified by the absence of a single instrument composed of clinical and social questions appropriate for the Brazilian population. Thus, the prevalence of frail elderly persons in Brazil is uncertain².

In this context, the present study aimed to analyze the vulnerability of elderly residents in the community through the *Vulnerable Elders Survey* (VES-13) questionnaire.

METHOD

A quantitative cross-sectional survey was carried out using the database of the program of the Municipal Health Department of Palma, Paraná. This is a city located in the southern region of Brazil, with 42,888 inhabitants, of which 3,204 are elderly. All elderly persons (over 60 years old) treated at the public health service of the city are evaluated for their vulnerability, using the *Vulnerable Elders Survey*

(VES-13) protocol⁴. This instrument consists of 13 items that include the self-perception of health, the presence of physical limitations and functional decline. Initially, the elderly are classified into two groups: vulnerable (VES-13 \geq 3) and non-vulnerable (VES-13 $<$ 3).

The present study also adopted the classification used by the Health Department of the State of Paraná, in which robust elderly (VES-13 \leq 2) are those individuals who are able to manage their life independently and autonomously, have no functional disabilities or a chronic health condition associated with greater vulnerability. Elderly persons with a moderate risk or at risk of frailty (VES-13 from 3 to 6) manage their life independently, however, although they are in a dynamic state of senescence and senility, leading to functional decline, they are not yet dependent and may present one or more associated chronic conditions. Finally, frail elderly persons, with a high risk of frailty (VES-13 \geq 7) are those with established functional decline who are unable to manage their lives autonomously due to the presence of single or multiple disabilities⁴.

Data collection was performed through the analysis of medical records registered in the support software of the health service of the city, which is maintained by professionals, according to their area of expertise. This software contains all VES-13 questionnaires already completed in the city. During the collection of these data, which took place from January 2016 to December 2017, 1,062 people had answered this questionnaire, all of whom were included in the study. Exclusion criteria were incomplete questionnaires.

The student's t-test for independent samples was used to compare the distribution of quantitative variables, and the chi-square and Fisher's exact tests were used to analyze the association of categorical variables. Correlation between quantitative variables was performed using Pearson's correlation coefficient. A 95% confidence level was adopted.

The study was approved by the Ethics Research Committee of the Universidade do Oeste de Santa Catarina (or Unoesc), under opinion n° 2.237.890.

RESULTS

Of the 1,062 questionnaires analyzed, 609 (57.3%) were women, aged between 60 and 104, with an average age of 69 (± 7.8) years. In total 42.0% rated their health as fair and 35.2% as good.

In the present study, 635 (59.8%) elderly persons were classified as robust, 176 (16.6%) as at risk of frailty and 251 (23.6%) as frail.

Table 1 shows the prevalence of self-reported disability in performing Instrumental Activities of Daily Living (IADL), according to the variables *gender*, *age* and *vulnerability*. Women reported more difficulty in dealing with money ($p < 0.001$), performing housework ($p < 0.001$) and shopping ($p < 0.001$) than men. People over 75 reported more difficulties shopping, dealing

with money, walking in the bedroom or walking in the living room and doing household chores. In the vulnerable elderly, the biggest difficulties were shopping (68.7%) and dealing with money (56.9%).

Table 2 shows that most vulnerable elderly persons reported greater difficulty or the inability to perform mobility-related activities, such as: bending, kneeling or crouching; lifting or carry five-pound objects; writing or handling small objects; walking 400 meters and performing heavy household chores, all of which had rates above 90%; while the robust elderly, the minority, presented difficulties in mobility activities, with rates below 10%.

The most vulnerable people were women over 75 years old, with high blood pressure and/or diabetes (Table 3).

Table 1. Disabilities in carrying out self-reported Instrumental Activities of Daily Living, according to the VES-13. Palmas, Parana, 2018.

Variables	Shopping* n (%)	Money** n (%)	Domestic chores*** n (%)	<i>p</i> ***
Gender				
Female	183 (30.0)	151 (24.7)	122 (20.0)	<0.001
Male	90 (19.8)	76 (16.7)	59 (13.0)	
Age (years)				
60-74	154 (18.9)	130 (15.9)	97 (11.9)	<0.001
Over 75	119 (48.1)	97 (39.2)	84 (34.0)	
Vulnerability				
Yes	273 (68.7)	226 (56.9)	181 (45.5)	<0.001
No	0 (0.0)	01 (0.1)	0 (0.0)	

* Inability to shop alone; ** inability to handle money; *** inability to perform light housework alone; **** Chi-square test and Fisher's test

Table 2. Distribution of the elderly persons according to physical limitations based on VES-13 score and relationship with vulnerability. Palmas, Parana, 2018.

Variables	Individual vulnerability		<i>p</i> *
	Yes n (%)	No n (%)	
Limitation described			
Bend over, kneel or crouch	260 (92.9)	20 (7.1)	<0.001
Lifting or carrying 5 kg objects	239 (94.5)	14 (5.5)	<0.001
Raise/extend arms above shoulder level	172 (95.0)	09 (5.0)	<0.001
Write or handle and hold small objects	140 (96.5)	05 (3.5)	<0.001
Walk 400 meters	235 (94.4)	14 (5.6)	<0.001
Perform heavy housework tasks	289 (90.3)	31 (9.7)	<0.001

* Chi-square test.

Table 3. Vulnerability according to VES-13 adopted in Paraná. Palmas, Paraná, 2018.

Variables	Vulnerable n (%)	Non-vulnerable n (%)	<i>p</i> *
Gender			
Female	261 (42.9)	348 (57.1)	<0.001
Male	136 (30.0)	317 (70.0)	
Age (years)			
60-74	234 (28.7)	581 (71.3)	<0.001
Over 75	163 (66.0)	84 (34.0)	
High blood pressure			
Yes	220 (42.4)	299 (57.6)	<0.001
No	177 (32.6)	366 (67.4)	
Diabetic			
Yes	64 (46.7)	73 (53.3)	<0.001
No	333 (36.0)	592 (64.0)	

*Chi-square test.

DISCUSSION

The present study found that people over 75 years of age, who were female and had one or more chronic non-communicable disease such as high blood pressure and diabetes mellitus exhibited greater vulnerability, corroborating literature and studies conducted with elderly Brazilians that show that high blood pressure and/or diabetes is related to greater frailty among the elderly^{5,6}.

High blood pressure and diabetes mellitus are chronic diseases linked to social determinants, such as: differences in access to information and services, social inequalities, low education levels, and modifiable factors such as smoking, physical inactivity and inadequate diet.

Suffering from a chronic disease increases the risk of vulnerability, and it is essential that these pathologies are tackled through the health service and intersectoral articulation, with the aim of reducing social disparities and generating a better quality of life for the elderly^{7,8}.

Another aspect observed in this study is the feminization of the elderly population. Census data from Brazil indicate that the female contingent over 60 years old has remained stable, being 50.7% in 2000 and 50.6% in 2019. In Paraná, in 2019,

it is reported that 50.6% of people over 60 years of age are women^{9,10}. Although they have greater longevity, studies show that older women are more vulnerable, due to factors such as low education and pay, loneliness and social isolation, and prolonged exposure to diseases such as high blood pressure, diabetes, depression and cancer^{11,12}. In this study, women were more vulnerable, and reported more difficulty dealing with money, doing household chores and shopping.

In this research, most considered their health to be good or fair, with self-rated health in the elderly considered an excellent predictor of morbidity and mortality.

Self-perception of health is an indirect indicator of the presence of chronic degenerative diseases, and has therefore been the subject of research in other countries and been used as an indicator in the area of aging associated with functional capacity and mortality^{13,14}.

Functional capacity demonstrates the ability of human beings to remain independent in their instrumental activities of daily living, which correspond to the complex skills necessary to live independently. People with disabling processes are hampered in the performance of activities related to social functions and autonomy, causing disruption

for themselves and their families, who depending on the activity, will have to spend more time and financial resources on their needs^{15,16}.

Physical limitations or functional incapacity refer to the difficulty or impossibility of performing daily activities, influencing the quality of life of the elderly, and are related to the loss of autonomy, increased risk of hospitalization, institutionalization and death¹⁷. In this study, the people with the greatest difficulties in instrumental activities of daily living were women, vulnerable elderly persons and those over 75 years of age, and so these groups should be a priority in social and health actions and strategies.

Studies have found that functional disability is associated with physical activity, nutritional status and the number of chronic noncommunicable diseases. Age also directly interferes with functional capacity, and every additional ten years lived increases the risk of functional decline approximately two fold, with elderly people aged 80 and over having a 25 times greater chance of decline in functional capacity than younger elderly persons^{17,18}.

The limitations of this study were its cross-sectional assessment, which evaluated the data at a single point in time, and the lack of sociodemographic data so that other associations could be made, such as place of residence, education and income.

CONCLUSION

According to the results obtained in the study, it is possible to conclude that the elderly residing in the city of Palmas, Paraná, consider their health to be good and are, in the majority, robust and autonomous in terms of the performance of their daily activities. There is a high number of elderly persons considered fragile, however, who are therefore more susceptible to social and physical complications.

The most vulnerable elderly are women over 75 years old who have at least one non-communicable chronic disease.

The presence of a chronic disease as a susceptibility factor for vulnerability points to the need to promote the control of these diseases and prevent harm, as they are considered the main causes of death in the elderly.

The present study contributes data to illustrate the vulnerability of the elderly in the city and thus the possibility of developing intervention strategies for the health care of the elderly.

It is necessary to expand the care of the elderly in an interdisciplinary manner, acting in a preventive manner, providing a better quality of life, delaying and overcoming disabilities and age-related limitations, working and putting into practice the existing public policies, viewing the elderly from a multidimensional perspective.

REFERENCES

1. Liberalesso TEM, Dallazen F, Bandeira VAC, Berlezi EM. Prevalência de fragilidade em uma população de longevos na região Sul do Brasil. *Saúde Debate* 2017; 41 (113): 553-562.
2. Jesus ITM, Orlandi AAS, Grazziano ES, Zazzetta MS. Fragilidade de idosos em vulnerabilidade social. *Acta Paul Enferm* 2017; 30(6):614-20.
3. Barbosa KTF. Vulnerabilidade física, social e programática de idosos atendidos na Atenção Primária de Saúde do Município de João Pessoa, Paraíba. [Dissertação Mestrado em Enfermagem] - Universidade Federal da Paraíba, João Pessoa, 2015. Disponível em: <https://repositorio.ufpb.br/jspui/handle/tede/7591>
4. Paraná Secretaria da Saúde, Avaliação Multidimensional do Idoso. 1 ed. Curitiba: SESA, 2017.
5. Carneiro JA, Ramos GCF, Barbosa ATF, Costa FM, Caldeira AP. Prevalence and factors associated with frailty in non-institutionalized older adults. *Rev. Bras Enferm* 2016 [acesso em 20 de mar. 2018]; 69(3): 408-15. Disponível em: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0034-71672016000300435&lng=en&nrm=iso>.
6. Francisco PMSB, Borim FSA, Malta DC, Segri NJ. Prevalência simultânea de hipertensão e diabetes em idosos brasileiros: desigualdades individuais e contextuais. *Rev. Cien Saude Col* 2016 [acesso em 22 mar. 2018]; 23 (11):3829-3840. Disponível em: <http://www.cienciasaudecoletiva.com.br/artigos/prevalencia-simultanea-de-hipertensao-e-diabetes-em-idosos-brasileiros-desigualdades-individuais-e-contextuais/15958>.

7. Malta DC, Stopa SR, Szwarcwald, CL, Gomes NL, Silva Junior JB, Reis AAC. A vigilância e o monitoramento das principais doenças crônicas não transmissíveis no Brasil – Pesquisa Nacional de Saúde, 2013. *Rev Bras Epidemiol* 2015 [acesso 22 out 2018]; 18 (SUPPL 2): 3-16. Disponível em: <https://www.scielo.org/pdf/rbepid/2015.v18suppl2/3-16/pt>
8. Malta DC et al. Doenças crônicas não transmissíveis e o suporte das ações intersetoriais no seu enfrentamento. *Ciênc saúde col* 2014 [acesso em 22 out. 2018]; 19 (11): 4341-4350. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1413-81232014001104341&lng=en&rm=iso.
9. Nicodemo D, Godoi MP. Juventude dos anos 60-70 e envelhecimento: estudo de casos sobre feminização e direitos de mulheres idosas. *Revista Ciência em Extensão* 2010 [acesso em 23 abr. 2018]; 6(1). Disponível em: http://ojs.unesp.br/index.php/revista_proex/article/view/324/341.
10. Ministério da Saúde - DATASUS [acesso em 05 jul. 2019]. Disponível em: <http://www2.datasus.gov.br/DATASUS/index.php?area=0206&cid=6942>.
11. Moura MAV, Domingos AM, Rassy MEC. A qualidade na atenção à saúde da mulher idosa: um relato de experiência. *Rev Esc Anna Nery* 2010 [acesso 20 out. 2018]; 14(4): 848-855. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1414-81452010000400027&lng=en.
12. Koch RF, Leite MT, Hildebrandt LM, Linck CL, Terra MG, Gonçalves LTH. Depressão na percepção de idosas de grupos de convivência. *Rev Enf UFPE on line* 2013 [acesso 20 out. 2018]; 7 (9): 5574-5582. Disponível em: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/13676/16568>.
13. Blazer DG. How do you feel about...? Health outcomes in late life and self-perceptions of health and well-being. *Gerontologist*, 2008 [acesso em 22 mar. 2018];48(4):415-22. Disponível em: <https://www.ncbi.nlm.nih.gov/pubmed/18728291>
14. Arnadottir AS, Gunnarsdottir ED, Stenlund H, Lundin-Olsson L. Determinants of self-rated health in old age: A population-based, cross-sectional study using the International Classification of Functioning. *BMC Public Health*. 2011 [acesso em 15 mar. 2018] Disponível em: <https://bmcpublichealth.biomedcentral.com/articles/10.1186/1471-2458-11-670>.
15. Zimmer RZ, Martin LG, Jones BL, Nagin DS. Examining late-life functional limitation trajectories and their associations with underlying onset, recovery and mortality. *J Gerontol B Psychol Sci Soc Sci*. 2014 [acesso 15 mai. 2018]; 69(2): 275-86. Disponível em: <https://www.ncbi.nlm.nih.gov/pubmed/24531526>.
16. Silva Junior RF, Medrado KDM, Lima ER, Medeiros MRB, Siqueira LG, Teles MAB. Evaluation of the functional capacity of the elderly registered at a family health strategy. *Journal of Nursing UFPE on line*, 2017 [acesso 20 jul. 2018];11(6): 2620-2627. Disponível em: <https://periodicos.ufpe.br/revistas/revistaenfermagem/article/view/23431/19122>.
17. Brito KQD, Menezes TN, Olinda RA. Functional disability: health conditions and physical activity practice in older adults. *Rev Bras Enferm*. 2016 [acesso em 10 jul. 2018];69(5):773-80. Disponível em: <http://dx.doi.org/10.1590/0034-7167.2016690502>
18. Santos GS, Cunha ICKO. Avaliação da Capacidade Funcional de Idosos Para o Desempenho das Atividades Instrumentais da Vida Diária: Um Estudo na Atenção Básica em Saúde. *Rev Enferm Cent O Min* 2013 [acesso 28 abr. 2018]; 3(3):820-828. Disponível em: <http://www.seer.ufsj.edu.br/index.php/recom/article/view/421>.