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DEPRESSION-FREE LIFE EXPECTANCY IN ELDERLY POPULATIONS IN CEARÁ, NORTHEAST AND BRAZIL

EXPECTATIVA DE VIDA LIVRE DE DEPRESSÃO NAS POPULAÇÕES DE IDOSOS DO CEARÁ, NORDESTE E BRASIL

ESPERANZA DE VIDA LIBRE DE DEPRESIÓN EN LA POBLACIÓN ANCIANA DE CEARÁ, NORDESTE Y BRASIL

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ABSTRACT

This paper investigated depression-free life expectancy in the elderly population of Ceará, the Northeast and Brazil. We used data from the 2019 National Health Survey (PNS) and the projections of the Mortality Tables provided by the Brazilian Institute of Geography and Statistics (IBGE) in 2018. Sullivan's method was used to estimate depression-free life expectancy at age 60 years. The results show that, among the elderly in the analyzed regions, women are at a disadvantage in the number of years they will live with depression compared to men. Which suggests that women live longer with depression compared to men. Among the populations analyzed, it was also found that the one in the Northeast showed the smallest difference in the prevalence of depression in the elderly between the sexes, with 11.6% in women and 3.7% in men. In general, the Northeast has the lowest prevalence of depression among the elderly, when compared to the other two regions.

Keywords: Healthy life expectancy. Depression. Aged.

RESUMO

O presente estudo investigou a expectativa de vida livre de depressão na população idosa do Ceará, do Nordeste e do Brasil. Para o cálculo desse indicador, utilizaram-se os dados da Pesquisa Nacional de Saúde (PNS) de 2019 e as Tábuas de Mortalidade projetadas pelo Instituto Brasileiro de Geografia e Estatística (IBGE), em 2018. Foi empregado o método de Sullivan para estimar as expectativas com e sem depressão na idade de 60 anos. Os resultados mostram que, entre os idosos das regiões analisadas, as mulheres estão em desvantagem no número de anos que viverão com depressão em relação aos homens. Constatou-se, também, dentre as populações analisadas, a do Nordeste foi a que apresentou a menor diferença de prevalência de depressão entre os sexos, sendo 11,6% nas mulheres e 3,7% nos homens. Em termos gerais, é no Nordeste que estão as menores prevalências de depressão entre idosos, se comparado às outras duas regiões.

Palavras-chave: Expectativa de vida saudável. Depressão. Idosos.

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RESUMEN

El presente estudio investigó la esperanza de vida libre de depresión en la población anciana de Ceará, Nordeste y Brasil. Para calcular este indicador se utilizaron datos de la Encuesta Nacional de Salud (PNS) de 2019 y las Tablas de Mortalidad proyectadas por el Instituto Brasileño de Geografía y Estadística (IBGE) en 2018. Se utilizó el método de Sullivan para estimar las expectativas con y sin depresión en la edad de 60 años. Los resultados muestran que, entre los ancianos de las regiones analizadas, las mujeres están en desventaja en el número de años que vivirán con depresión en comparación con los hombres. Lo que sugiere que las mujeres viven más tiempo con la depresión en comparación con los hombres. También se encontró, entre las poblaciones analizadas, el Nordeste fue el que presentó menor diferencia en la prevalencia de depresión en ancianos entre sexos, con 11,6% en mujeres y 3,7% en hombres. En general, el noreste tiene la prevalencia más baja de depresión entre los ancianos, en comparación con las otras dos regiones.

Palabras clave: Esperanza de vida saludable. Depresión. Mayores.

1 INTRODUCTION

The world is going through a population aging process. It is estimated that, in 2025, there will be approximately 1.2 billion elderly people and that, by 2050, this number will be two billion, with the fall in the fertility rate and the increase in life expectancy the factors that will ensure this continued growth (WHO, 2005).

Brazilian regulations, the National Policy for the Elderly (BRASIL, 1994) and the Elderly Statute (BRASIL, 2003), and the World Health Organization define the elderly as people aged over 60 years. No, Brazil, according to the Population Projection released by the IBGE (2018a), in that same year there were more than 28 million people belonging to this age group, equivalent to 13.4% of the Brazilian population. It is also estimated that in 2060 this percentage will be 32.2%, representing more than 73 million elderly people.

This trend is also observed in the projections for Ceará and the Northeast, where the number of elderly people in 2018 corresponded, respectively, to 1.1 million (12.31%) and 6.8 million (12.02%), increasing to be, according to the projection, 3 million (32.73%) and 18.4 million (32.28%) in 2060.

The Projection of Indicators, also released by the IBGE (2018b), notes the decline in the fertility rate from 1.77, in 2018, to 1.66, in 2060, and the increase in the aging index - proportion of the elderly population in in relation to the young population, aged 0 to 14 years – ranging from 43.19%, in 2018, to 173.47%, in 2060, in Brazil. Furthermore, according to the Complete Mortality Tables (IBGE, 2018c), life expectancy at birth for Brazilians will jump from 76 years to 81 years between 2018 and 2060. The sum of these factors contributes to the Brazilian demographic transition , causing a change in the age pyramid, with the enlargement of the top of the pyramid and the narrowing of its base, thus evidencing the aging of the population.

According to Storchi (2015), as a result of increased longevity, a higher prevalence of chronic diseases and functional limitations is observed. The increase in non-communicable chronic diseases (NCDs) is also pointed out in the work of Guimarães and Andrade (2020) and Campolina et al. (2013) as a consequence of increased life expectancy.

The UN Health Policy Project on Healthy Aging (2015) highlights that, as the individual ages, non-communicable diseases (NCDs) become more frequent, and are considered the main causes of mortality, disability and morbidity in the world. Mental illnesses, especially dementia and depression, the latter being the object of this study, are identified as one of the main chronic diseases that affect the elderly. According to the World Health Organization, depression is responsible for 4.3% of the global burden of disease and is among the main causes of disability in the world, especially among women (WHO, 2013).

In Brazil, the National Health Survey (PNS), carried out by the Ministry of Health in partnership with the IBGE, collects health information that makes it possible to establish surveillance of chronic diseases and their determinants. The 2019 survey results revealed that, in all CNCDs, the proportion of people diagnosed with a certain condition increases with advancing age. Furthermore, women had a higher prevalence of chronic diseases than men, with the exception of cardiovascular diseases (IBGE, 2020).

It is noted, therefore, that the increase in life expectancy combined with the growing number of elderly people brings with it a range of challenges, including that of ensuring the quality of life of this age group, as it is not enough to live longer, it is necessary, also, live better.

As evidenced by Guimarães and Andrade (2020) “the increase in life expectancy is seen as an indicator that reflects the improvement in the population's health status”. However, as it does not take into account changes in morbidity, disability and/or other health indicators inherent to senility, life expectancy alone is not capable of determining how many years old age will be lived with quality, thus requiring, the use of other methods that allow investigating the life expectancy free of morbidities (GUIMARÃES; ANDRADE, 2020).

In view of these issues and considering the importance of the themes of depression and population aging, it is essential to investigate the mental health conditions of the elderly population, according to different regional and socioeconomic patterns, in order to raise debates for the formulation of public policies. Thus, the purpose of this article is to calculate the depression-free life expectancy of elderly populations in Ceará, the Northeast and Brazil, for the year 2019.

This article is divided into four parts, the first of which is this introduction. In the second, the theoretical framework will be presented. The third and fourth sections deal with the method applied to the study and the discussion of the results found. In the last part are the final remarks.

2 THEORETICAL BACKGROUND

Depression is one of the chronic diseases that most affects the elderly in the world. According to the Pan American Health Organization - PAHO (2017, p. 1), “depression is a mental disorder characterized by persistent sadness and loss of interest in activities that are normally pleasurable, accompanied by the inability to perform daily activities during at least two weeks."

PAHO (2017) estimates that there are, in the world, more than 300 million people, of all ages, who suffer from depression, this disorder being the main cause of disability worldwide. The organization also emphasizes that depression is more common in women and

is quite common in the elderly and that it is often associated with physical illnesses such as heart disease, hypertension, diabetes or chronic pain, thus contributing significantly to the global burden of disease; and highlights the high risk of an elderly person with depression committing suicide.

Ozaky (2015) pointed out the association between depression and CNCDs, citing that a depressive person has a higher mortality, in addition to a higher risk of being affected by a chronic disease, as well as the chances that an individual who has a CNCD come to have depression is much greater than if compared to someone who does not have a chronic disease.

A summary measure widely used to portray the health conditions of a population is life expectancy, however this indicator does not measure the quality of the years lived by the population. With advancing age, there is a greater prevalence of chronic diseases that affect the quality of life of individuals and life expectancy per se does not reveal what part of the additional years lived is with quality (WOLFSON, 1996). Healthy life expectancy, on the other hand, refers to the average time to be lived in good health.

There are several studies that deal with the impact of a given health condition on the population's life expectancy. Campolina et al. (2013) investigated the impact of the elimination of chronic diseases by estimating the disability-free life expectancy of the elderly population; Camargos, Machado and Rodrigues (2000) analyzed life expectancy with and without disabilities in the city of São Paulo; the focus of the study by Guimarães and Andrade (2020) was multimorbidity; Yang (2013), in turn, determined the quality of life of the US population through the prevalence of subjective well-being; for Menezes, Lima and Rocha (2019), the target was arterial hypertension; while Rocha and Pinho (2019) investigated life expectancy with and without severe disability. Using depression in studies about Brazil, the works by Andrade et al. (2016) and Alves and Pereira (2018).

In all of the examples mentioned, the Sullivan (1971) method was used to calculate life expectancy with and without the observed health factor, which basically consists of combining mortality information with morbidity information (JAGGER; HAUET; BROUARD, 2001; CRAVCENCO, 2018). The Sullivan method is a simple and commonly used method to calculate healthy life expectancy (JAGGER et al., 1998; CRAVCENCO, 2018).

Garcia et al. (2019) calculated life expectancy with and without depression for elderly Mexicans living in the southwestern United States. The study used individual longitudinal survey data from 1993 to 2013 to obtain estimates of the prevalence of depression. For 65-year-olds, the proportion of life expectancy with depression for migrants resulted in 13.8% and 30.6% for men and women, respectively.

Andrade et al. (2016) estimate life expectancy with and without depression for elderly people living in the city of São Paulo, in 2000 and 2010. For 2010, life expectancy with depression resulted in 2.7 years for men and 5.9 years for women; which corresponds, as a proportion of total life expectancy, to 13.9% and 25%, for men and women, respectively.

Alves and Pereira (2018) present the life expectancy without depression for Brazil, by sex and race/color, in the years 1998, 2008 and 2013. Based on the results, it was found that the highest proportions of time lived with depression are among women and white race/color. Considering the most recent date of analysis, the year 2013, and the white race/color, the proportions of time lived with depression resulted in 7.5% and 12.8%, for men and women, respectively.

3 METHOD

This work is characterized as a descriptive and quantitative research. The analysis group is the elderly, characterized here as individuals aged over 60 years. The regions studied are Ceará, Northeast and Brazil. The year 2019 was defined as the analysis date, considering the availability of the most recent public data on depression in health research.

3.1 Data source

The present study uses PNS data from 2019 and the Projected Mortality Tables, in 2018, by sex for Brazil, Ceará and Northeast, published by IBGE. The prevalence of depression in Ceará, Northeast and Brazil was estimated using information from the National Health Survey – PNS (2019), which contains a module on chronic diseases. The dichotomous answers "yes" and "no" were used to the question "Has any doctor or mental health professional (such as a psychiatrist or psychologist) given you a diagnosis of depression?" It is contained in the Module Q questionnaire to determine the prevalence values of the health condition studied by age group and sex in the analyzed regions. Only the responses of people aged over 60 years and the weights existing in the base were used to guarantee the representativeness of the population, using the R Software.

To calculate life expectancy with and without depression in Ceará, the Northeast and Brazil, the mortality tables projected for the year 2019 by the IBGE (2018c) were used, with five-year intervals for the age groups, sex and investigated locations . Thus, the estimates of depression and mortality of the analyzed groups are referenced in 2019.

3.2 The Sullivan method

The method chosen for calculating life expectancies with and without depression was Sullivan's (1971) method. The method is simple and requires little data: only those provided by a mortality table and those relating to the morbidity of the analyzed health factor. Furthermore, the interpretation of the life expectancy indicator free from a specific health condition by the Sullivan method is easy to understand: it returns the expected number of years that a person, of a certain age, expects to live in a healthy state, without present limitations imposed by such condition (CRAVCENCO, 2018).

To calculate the indicator of this study - life expectancy with and without depression - prevalence information taken from the PNS for 2019 is used. The life expectancy without depression (EVSD) will be estimated for the elderly population in the state of Ceará, Northeast and Brazil in the year 2019. Thus, the EVSDx, for each age x, is calculated, by the Sullivan method, using the prevalence of depression in each age group, nix, to establish the quantity of person-years lived without depression (1-nix)nLx in each age group. Hence, life expectancy without depression, corresponding to the expected total years lived without depression from age x onwards, is calculated as Formula 1.

$$EVSD_x = \frac{\sum_{k=x}^{w}(1-{}_n i_k)_n L_k}{l_x} \quad (1)$$

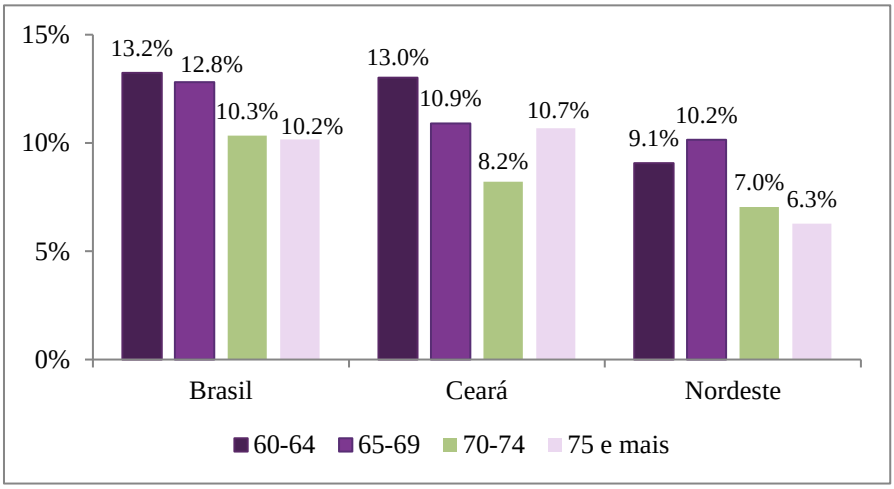
Considering the abbreviated Mortality Table and open range: x represents the age at which life expectancy is estimated; index k represents the initial ages of each interval (x, x+5, ..., w); w indicates the starting age of the open gap of the board; and lx denotes the expected number of survivors at age x of the Mortality Table representative of the study population (ROCHA; PINHO, 2019).

Life expectancy with depression (EVCDx) will be calculated from the ratio: EVCDx = EVx – EVSDx. EVx represents life expectancy at age x, available in the Mortality Tables of the populations studied, from IBGE projections (2018c).

4 RESULTS AND DISCUSSION

The prevalences of depression by age groups and by region for the year 2019 are shown in Figure 1. Initially, it should be noted that the prevalence of depression in the elderly in the three regions analyzed is higher in the first two age groups, which comprise the elderly aged 60 to 69 years. For the elderly in Brazil and Ceará, the age group with the highest prevalence of depression, approximately 13%, is between 60 and 64 years old. In the Northeast, it is observed that the highest prevalence of depression is found in the elderly aged 65 to 69 years (10.2%) and the lowest (6.3%) in the last group. In Ceará, the penultimate range – 70 to 74 years – has the lowest prevalence of depression, 8.2%, and the last range with 10.7%, see Figure 1.

Figure 1 – Prevalence of depression in the population aged 60 years and over in Ceará, the Northeast and Brazil in 2019, by age group

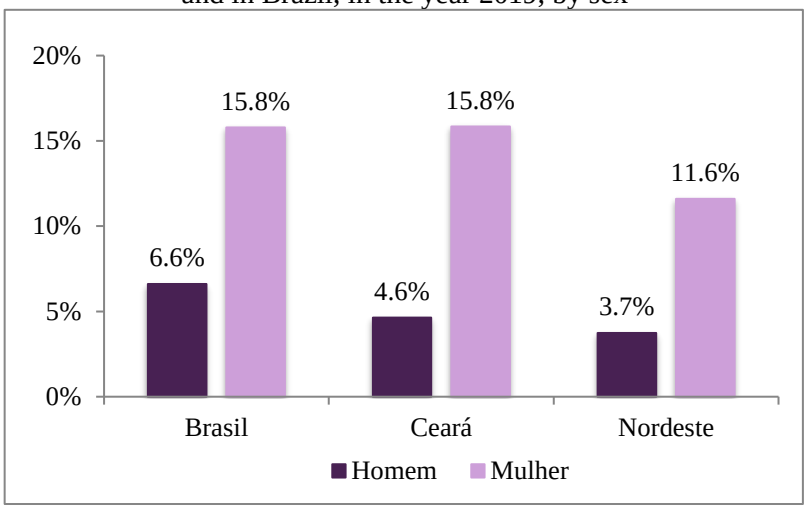


Source: Prepared by the authors from PNS data (2019)

Figure 2 shows the prevalence of depression in the population over 60 years of age, by region and by sex, for the year 2019. The prevalence of depression among women in Ceará and Brazil has the same level, 15.8% . For men and women, there is a lower prevalence of depression in the Northeast region. It is noteworthy that the prevalence of depression is higher among women, regardless of region; this difference by sex was also observed for other

populations and/or segmentations, according to García et al. (2019), Andrade et al. (2016) and Alves and Pereira (2018).

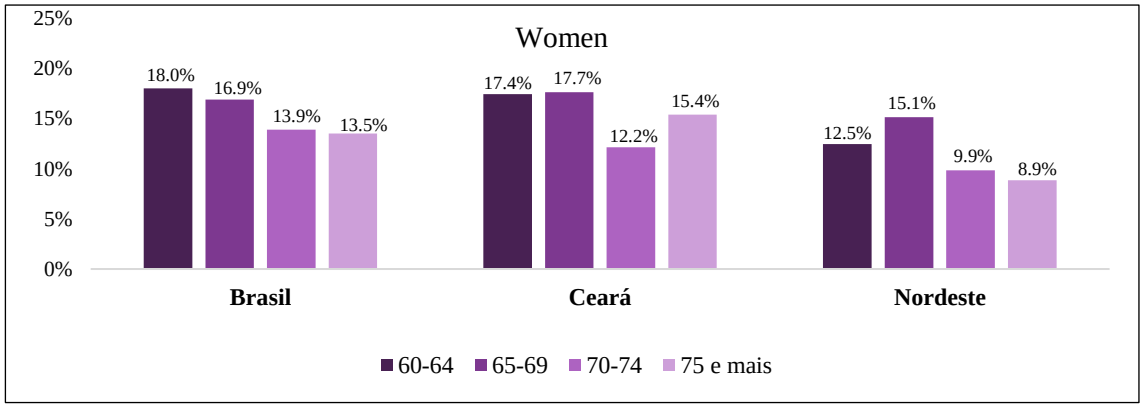
Figure 2 - Prevalence of depression in the population aged 60 years and over in Ceará, in the Northeast and in Brazil, in the year 2019, by sex

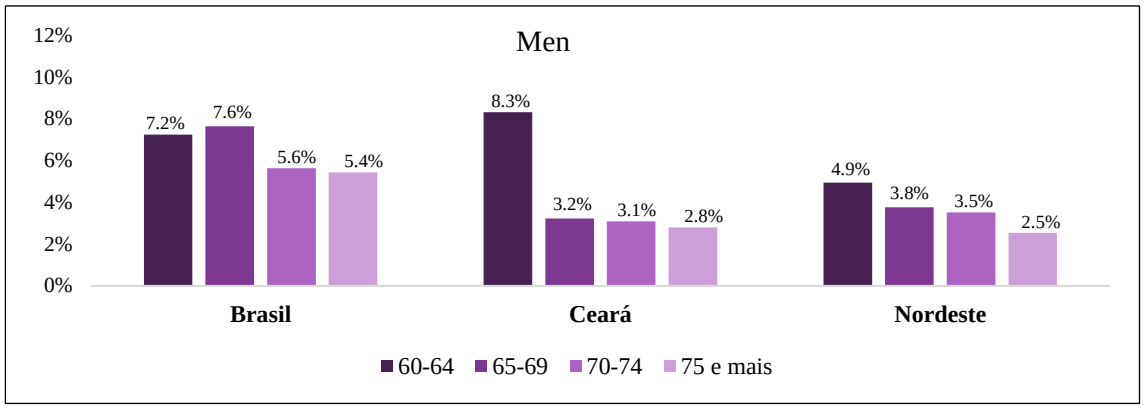


Source: Prepared by the authors from PNS data (2019)

The prevalence of depression by age group, region and sex are shown in Figure 3. It can be seen that, in all age groups and regions, the prevalence of depression in women is higher than that observed in men. Alves and Pereira (2018), in a study for Brazil, also verified this behavior of higher prevalence of depression for women when segmenting the data by race/color. The greatest difference can be observed in Ceará, for the age group 75 years and over, with estimated prevalence of depression of 15.4% and 2.8%, for women and men, respectively. The initial age groups, 60-64 and 65-69 years, have a higher prevalence of depression for all regions, between men and women.

Figure 3 ─ Prevalence of depression among elderly people with depression in Ceará, the Northeast and Brazil in 2019, by age group, sex and region





Source: Prepared by the authors from PNS data (2019)

For males, the highest prevalence of depression, 8.31%, was observed in the state of Ceará, aged 60 to 64 years; while the lowest prevalence corresponds to the elderly in the Northeast region over 75 years old. In women, the highest prevalence of depression is in the Brazilian population aged 60-64 years (18.01%) and the lowest prevalence of depression is observed among Northeastern women aged 75 years or more (8.87%).

Table 1 shows the estimates of Total Life Expectancy (EV), Depression-free (EVLD) and Depression-free (EVCD) of the elderly population by sex and region in 2019. The life expectancy of women is higher than that of men in all the regions analyzed, with the greatest difference, of 3.8 years, in the Northeast. When decomposing the total life expectancy into the two components, with and without depression, women have a longer mean survival time with depression in all regions studied; with the biggest difference, 2.8 years, verified in Ceará.

Table 1 – Indicators related to depression-free life expectancy at 60 years of age

Unity	EV	EVLD	EVCD	% EVLD	% EVCD
Brazil - year 2019					
Men	20.7	19.4	1.3	93.6%	6.4%
Women	24.4	20.7	3.7	84.9%	15.1%
Northeast- year 2019					
Men	19.5	18.8	0.7	96.4%	3.6%
Women	23.3	20.7	2.6	89.0%	11.0%
Ceará – year 2019					
Men	19.9	19.1	0.9	95.7%	4.3%
Women	23.2	19.5	3.6	84.3%	15.7%

Source: Prepared by the authors based on data from IBGE (2018) and PNS (2019).

Notes: EV - Life expectancy at age 60; EVLD – Life expectancy without depression at age 60 years; EVCD – Life expectancy with depression at age 60 years; %EVLD – Proportion of years lived free from depression at the age of 60 years; %EVCD – Proportion of years lived with depression at the age of 60 years.

Considering an analysis of life expectancy with and without depression in proportional terms to total life expectancies, it appears that the scenario is always favorable to men, which indicates that, considering only the studied health factor - depression, elderly men have a better quality of life. This male advantage was also verified in a study with elderly Mexican migrants living in the United States (GARCÍA ET AL., 2019) and in a research with elderly people by race/color (ALVES; PEREIRA, 2018).

In Brazil, in 2019, it is expected that a woman aged 60 years will reach 84.4 years, and of these 24.4 years of estimated survival, in 3.7 years they will live with depression, in proportional terms, 15.1% of their survival. For men, the estimated life expectancy is 20.7 years, with 1.3 years spent with depression; which represents 6.4% of their survival. In the Northeast and Ceará, 60-year-old women are expected to live 2.6 years and 3.6 years, respectively, with depression. For the male population in the Northeast and Ceará, it is estimated that they live less than 1 year with depression.

5 FINAL CONSIDERATIONS

Given the global concern with the health of the elderly in view of the increase in longevity and the numbers related to the diseases that affect them, especially non-communicable chronic diseases, including depression, estimates were constructed that allowed comparing the number of years lived with depression among the elderly. male and female elderly from the Brazil, Northeast and Ceará regions. Thus, this article estimated the years to be lived with and without depression by a person aged 60 years in these locations.

The results indicated differences in the quality of years lived between elderly men and women. Women had higher life expectancies. However, they have a lower proportion of years to be lived without depression, compared to men, in all regions analyzed. Thus, if on the one hand they live longer, in relation to men, on the other hand, they spend a greater number of years with depression, which is observed both in relative and absolute terms.

These results are similar to those found in several studies on the prevalence of CNCDs, which found the disadvantage of women in the proportion of years to be lived with worse health conditions. These disadvantages appear in the works by Campolina et al. (2013), Camargos, Machado and Rodrigues (2000), Guimarães and Andrade (2020), Menezes, Lima and Rocha (2019) and Rocha and Pinho (2019). Corroborating the results of the 2019 PNS and with general data from the UN and PAHO in relation to CNCDs.

The method used in this study was the Sullivan method, due to its ease and simplicity, in addition, the data needed for its use are easily found in research. For this work, mortality information, provided by the IBGE, was combined with information on the prevalence of depression among the elderly, available in the 2019 PNS, thus estimating life expectancies with and without depression at the age of 60 years old. Although this method does not incorporate changes in relation to improvements in the health conditions and mortality rates of the population, it is widely used and its results are quite reliable for this type of analysis (CAMARGOS, 2009). Therefore, it is believed that the estimates found in this work reflect the situation of the elderly population in Brazil, Northeast and Ceará in 2019.

In addition to the differences found between the sexes, the study also showed differences in the health conditions analyzed in Ceará, Northeast Region and Brazil. In the

general context, the prevalence of depression in the Northeast is lower than that observed in Brazil and Ceará. These results highlight the need to promote social and health policies, in accordance with the differences identified between the groups studied, adapting the strategies to different needs, in order to expand and ensure a better life for the elderly.

The study also draws attention to the fragility of health of elderly women, in relation to men, and raises reflection on the causes of this difference.

As a limitation of the study, the temporality of the data is highlighted, in view of the changes in health standards as a result of COVID-19. Studies indicate an increase in depression in the Brazilian population since the arrival of the pandemic in Brazil. Furthermore, the elderly population has higher mortality rates due to COVID-19, which also deserves investigation. It is therefore suggested, for future studies, the analysis of depression and the increase in cases diagnosed as a result of the effects of the pandemic.

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