Prevalence and factors associated with depression in the elderly: a cross-sectional study

Prevalência e fatores associados à depressão em idosos: um estudo transversal

Tainara da Silva Mattos Leite[2,3] (ID), Carlos Alexandre Fett[1,2,3] (ID), Luiz Fabrizio Stoppiglia[2,3] (ID),
Thiago Neves[2,3] (ID), Karla Régia Ferreira Viana Figueiredo[2,3] (ID), Rosilene Andrade Silva Rodrigues[1,3] (ID),
Waléria Christiane Rezende Fett[1,2,3] (ID)

ABSTRACT

Introduction: Depression is a psychiatric disease that causes losses in the biopsychosocial aspect of the affected individuals. The prevalence in the elderly population is significant, and identify the factors related to this outcome allows preventive measures and treatment can be early applied. **Objective:** Assessing the association between depression and sociodemographic and health risk factors in the elderly. **Methods:** This is a cross-sectional study involving 388 elderly of both genders, aged 65 years and older, urban residents of the city of Cuiabá, state of Mato Grosso (MT), Brazil. A sociodemographic questionnaire, as well as a self-report of chronic diseases and lifestyle, a self-report questionnaire of functional capacity, occurrence of falls, Geriatric Depression Scale, mental state assessment, and anthropometry tests were used. The chi-square test, *odds ratio* (OR), and multiple logistic regression with 95% confidence interval and p<5% were used in the statistical analysis. **Results:** There was a predominance of women (64%) who were mulatto/caboclo/brown skin (43%) and married (45%). Depression was significantly associated with: the lowest level of education, <8 years (OR=2.15; p=0.012), partial or total dependence of instrumental activities of daily living (OR=1.85; p=0.003), having five or more diseases (OR=2.93, p=0.002), falls in the last twelve months (OR=1.90; p=0.021), and sleep (OR=2.39; p<0.001) and visual difficulties (OR=2.28; p<0.001). **Conclusion:** Depression in this group of elderly was associated with modifiable and preventable factors in the health of these people. Thus, the early diagnosis of risk factors associated with depression, the inclusion of social, physical and cognitive activities must be considered for their prevention.

Keywords: Morbidity; Aging; Quality of life.

RESUMO

Introdução: Depressão é uma doença psiquiátrica e provoca prejuízos no aspecto biopsicossocial dos indivíduos acometidos. Sua prevalência na população idosa é expressiva, a identificação dos fatores relacionados a este desfecho permitem que medidas preventivas e de tratamento sejam aplicadas precocemente. **Objetivo:** Avaliar a associação entre depressão, os fatores sociodemográficos e os riscos para a saúde em idosos. **Métodos:** Estudo transversal com 388 idosos de ambos os sexos com idade igual ou superior a 65 anos, residentes do município de Cuiabá, estado de Mato Grosso (MT), Brasil. Foram usados questionários sociodemográficos, instrumentos de autorrelato de doenças crônicas, de estilo de vida, ocorrência de quedas e de capacidade funcional, escala de depressão geriátrica, avaliação do estado mental e testes de antropometria. Na análise estatística utilizou-se teste do qui-quadrado, *odds ratio* (OR) e regressão logística múltipla com intervalo de confiança de 95% e p<5%. **Resultados:** Encontrou-se predominância de mulheres (64%), sendo mulata/cabocla/parda (43%) e casadas (45%). A depressão foi significativamente associada com: o tercil mais baixo de educação <8 anos (OR=2,15; p=0,012); com dependência parcial ou total de atividades instrumentais da vida diária (OR=1,85; p=0,003); ter cinco ou mais doenças crônicas (OR=2,93; p=0,002), ocorrência de quedas nos últimos doze meses (OR=1,90; p=0,021); dificuldades de sono (OR=2,39; p<0,001) e visual (OR=2,28; p<0,001). **Conclusão:** A depressão estava associada a fatores modificáveis e que podem ser prevenidos. Desta forma, o diagnóstico precoce destes fatores de risco, a inclusão de atividades socias, físicas e cognitivas devem ser consideradas para sua prevenção.

Palavras-chave: Morbidades; Envelhecimento; Qualidade de vida.

INTRODUCTION

According to the World Health Organization (WHO), around 322 million people live with depression, and women are more affected than men (5.1% and 3.6%, respectively)[1]. In Brazil, 11.1% of the population aged between 60 and 64 years have already been diagnosed with depression[2]. Depression in Brazil is the third leading cause of claiming sick pay from the National Institute of Social Security (INSS), and one of the leading causes of abstention and loss of labor productivity[3]. Between 2016 and 2030, the treatment coverage for depression and anxiety will increase from 7 to 33% and from 28 to 50% in low-income and middle-income countries, respectively[4]. Moreover, these projections are expected to be worsened due to the current COVID-19 pandemic, which is associated with cognitive and emotional impairments, like depression[5].

The decline in fertility and mortality in the last decades has contributed to the changing age structure of the world population, which is gradually aging. This phenomenon is due to the increase in life expectancy with a decrease in the younger population and an increase in the elderly population[6]. Even the aging process occurring individually, it is influenced by economic, cultural, emotional, genetic, environmental, and life habits[7].

Neuropsychological and psychological disorders, changes in activities of daily life (ADL), memory oscillation, reasoning speed, sleep disturbances, and mental confusion have also been observed. Thus, these manifestations may be associated with symptoms of dementia[8] or depression in the elderly group[9].

Depression is a serious mental health problem, that may compromise physical[10], emotional, cognitive, and psychomotor quality of life, resulting in suicide[11], in extreme cases. Thus, it affects the professional, academic, and family life of any person[12]. The characteristics of depression include irritable mood and less propensity to pleasure and joy, and may be accompanied by subjective tiredness or fatigue, change in sleep and appetite, general lack of interest, pessimism, slowness, and feelings of failure[13].

However, there is a difficulty in diagnosing depression by health professionals, the elderly, and their families, who underestimate the symptoms and confuse them with other diseases, classifying them as typical symptoms of aging[14]. Some authors adopt instruments with scales[15,16,17], visual humor thermometer[18], and diagnostic criteria of mental disorders[19] in medical semiology. There is also research[20] that found an association of biochemical markers, such as vitamin D, with the increased prevalence of depression. In the meta-analysis[21], we found an association of depression with the Interleukin-6 in the elderly population.

For establishing health goals and subsidize public policies on depressive disorders, it is necessary to understand the changes in the variables by type of disorder, country, region, age, gender, and year[22]. Therefore, identifying the profile of depressed elderly will allow us to develop strategies for screening and early diagnosis[13] the disease in this population. In this way, it is possible to prevent the progression from healthy adults to dependent elderly, avoiding high financial costs and low quality of life[23].

Thus, this study aimed to estimate the prevalence of depression and associate it with the physical and social factors of the elderly.

MATERIALS AND METHOD

Design and study area

This is a cross-sectional and population-based study carried out with elderly patients aged 65 years and older, of both sexes, living in an urban area, and evaluated between March 2009 to April 2010 using maps provided by the Brazilian Institute for Geography and Statistics (IBGE)[2].

The number and location of the residences to be visited were determined according to the IBGE data, by the proportion of the elderly from each census tract related to the total of elderly living in the city. Then, the density of elderly was calculated per residence to establish the number of homes to be visited, counted, and drawn in each neighborhood. Thus, we identified 15 census tracts with a density of the elderly representative of the population of Cuiabá (Mato Grosso State, Brazil), and we counted and selected the blocks and streets where the residences to be visited were.

All participants were informed about the purpose of the research and signed an informed consent form. The study was approved (No. 632/09; Resolution 466/12 of the National Health Council) by the Research Ethics Committee of Julio Muller University Hospital of the Federal University of Mato Grosso (UFMT). The sample size (n) was first determined through the simple random sampling method, corresponding to a 5% error[24].

Participants and instruments

Non-participation criteria were: being a wheelchair user or bed-ridden even if transiently; having sequel of cerebrovascular accidents, decreased strength that could affect performance on tests, advanced Parkinson's disease, terminal state of cancer and other chronic diseases, and significant cognitive deficit – Mini-Mental State Examination ≤ 14. Data collection was performed in two stages. The first one was by a semi-structured interview at the elderly's home, and in the second phase, the physical-functional data were collected by trained evaluators in public schools, community centers, and health centers of the city.

In this subproject, the following variables were used: age, gender, marital status, living alone, schooling (individuals who report less than eight years of school attendance were considered with low education, those with eight years of school or more were considered to have a middle/high level of education), body mass [determined using a platform scale of the type Filizola® electronics ID 1500 (SP, Brazil) with a capacity of 200 kg and an accuracy of 0.1 kg]. The height was measured by a professional portable Sanny® stadiometer (SP, Brazil), with 0.1 cm accuracy. The body mass index was calculated using the weight ratio in kilograms by height in meters squared (kg/m²). The reference values adopted for the body mass index were those suggested and suitable for the elderly who categorizes in: <22.0 kg/m² = underweight, 22.0 kg/m² to 27.0 kg/m² = normal weight, and> 27.0 kg/m² = overweight[25]. Self-reported sleep changes, falls in the last year, hearing and visual deficits, self-reported diseases (heart disease, arterial hypertension, stroke, diabetes, depression, cancer, lung problems, osteoporosis, urinary and/or fecal incontinence), and the functional performance were evaluated using Lawton Instrumental Activities of Daily Living Scale (IADL)[26] and Basic Activities of Daily Living (BADL), Falls Efficacy Scale-International (FES-I)[26], cognitive function by Mini-Mental State Examination (MMSE)[15], and depression symptoms by the Geriatric Depression Scale (GDS-15)[27],[28]. The Five-Step test and Short Physical Performance Battery (SPPB)[26] were used for physical-functional evaluation.

Statistical analysis

Statistical analysis was performed using the SPSS® (Statistical Package for the Social Sciences), version 20.0 for Windows, considering the effect of study design and the sample weights. A descriptive analysis was performed by simple frequency and measures of central tendency. The Chi-square test was used to compare the groups with mild depression, moderate depression, and no depression.

The Geriatric Depression Scale in a reduced version of Yesavage (GDS-15) was used to detect depressive symptoms, which were classified according to severity, in which the elderly with less than 5 points were considered to have no depressive symptoms, with 5 or more points were considered with moderate depression, and with a score equal to or greater than 11 characterized with severe symptoms of depression.

The logistic regression analysis was performed by calculating the gross odds ratio (OR) to analyze the probability of association between depressed people and covariables (sociodemographic, body mass index, cognitive deficit, referred morbidity, reports of falls, low functional performance, and sleep, hearing, and visual problems). For all the variables, it was used 95% as a confidence interval and $p < 0.05$.

RESULTS

Five hundred and thirteen elderly were interviewed, 125 of them were excluded according to the criteria above-mentioned or because of absences/losses in the second stage of the

physical tests. The final sample consisted of 388 elderly, aged 65 years and older, of both sexes, living in the city of Cuiabá.

The mean age was 72±6 years, with a mean of 4±4 years of school attendance and a family income of 3±4 minimum wages. Women were predominant in the sample, and as for the marital status, the highest frequency of those married and widowed stood out (Table 1).

About 17% of the elderly with depression symptoms were between 65 and 69 years old. The sample comprised a prevalence of mild/moderate depression of 38.4% and severe depression of 3.1%. There was a greater percentage of depression in women, and those with mild/moderate or severe depression had lower schooling. Depression was significantly associated with years of school, BADL, and IADL, number of diseases, cardiovascular diseases, hypertension, diabetes mellitus, arthritis, osteoporosis, and urinary infection, low physical performance, falls in the last year, and sleep and visual difficulties (Tables 2 and 3).

The gross analysis of multiple logistic regression showed that older adults with low schooling were twice as likely to be depressed than those with medium or high schooling levels. By analyzing the functionality of the elderly, both in the BADL and IADL, those with partial or total dependence were approximately four times and two times, respectively, more likely to have depression. Older people who reported having five or more diseases were almost three times as likely to be depressed. Of the diseases reported, hypertension, diabetes mellitus, arthritis, osteoporosis, and urinary incontinence were associated with depression. Moreover, the elderly with urinary incontinence or sleep or visual problems are twice as likely to have depression. Finally, the older adults who had low performance or reported having suffered falls in the previous year are almost twice as likely to have depression (Table 4).

Table 1

Sociodemographic characterization of a sample of urban elderly residents in the sampled community (n=388)

Variable	n (Absolut number)	(%) (percentage)
Gender		
Male	139	36%
Female	249	64%
Ethnic Group		
White	136	35%
Black	70	18%
Mulatto/Caboclo/Brown	166	43%
Indigenous	8	2%
Yellow/Asian	8	2%
Marital status		
Married	173	45%
Single	42	11%
Divorced	31	8%
Widowed	142	37%

Table 2

Sociodemographic characterization by levels of depression of a sample of urban elderly residents in the sampled community (n=388)

Variable	No depression (n=227)	Mild/moderate depression (n=149)	Severe depression (n=12)	p-value
Gender				0.143
Male	89 (64%)	48 (35%)	2 (1%)	
Female	138 (55%)	101 (41%)	10 (4%)	
Age group				0.107
65 – 69 years old	80 (54%)	58 (40%)	9 (6%)	
70 – 74 years old	74 (64%)	42 (36%)	0 (0%)	
75 – 79 years old	44 (62%)	25 (35%)	2 (3%)	
Above 80 years old	29 (54%)	24 (44%)	1 (2%)	
Marital status				
Widowhood	74 (52%)	63 (44%)	5 (4%)	0.152
Living alone	35 (57%)	25 (41%)	1 (2%)	0.728
Years of Schooling				0.023*
Low	181 (56%)	132 (40%)	12 (4%)	
Medium/High	46 (73%)	17 (27%)	0 (0%)	
Life habits				
Smoking	22 (49%)	22 (49%)	1 (2%)	0.303
Alcoholism	60 (65%)	30 (32%)	3 (3%)	0.374
Basic activities of daily life				0.000*
Partial or total dependency	10 (25%)	26 (65%)	4 (10%)	
Independent	217 (62%)	123 (35%)	8 (3%)	
Instrumental activities of daily life				0.003*
Partial or total dependency	98 (51%)	84 (44%)	10 (5%)	
Independent	129 (66%)	65 (33%)	2 (1%)	

*$p < 0.05$ by Chi-square test; with 95% confidence interval.

Table 3

Sociodemographic characterization by levels of depression of a sample of urban elderly residents in the sampled community (n=388)

Variable	No depression (n=227)	Mild/moderate depression (n=149)	Severe depression (n=12)	p-value
Body mass index				0.875
Low weight	34 (58%)	22 (37%)	3 (5%)	
Eutrophy	83 (59%)	54 (39%)	3 (2%)	
Overweight	110 (58%)	73 (39%)	6 (3%)	
Self-reported disease				
Five or more diseases	14 (35%)	19 (47%)	7 (18%)	0.000*
Low Performance (SPPB)	38 (45%)	42 (50%)	4 (5%)	0.019*
Falls in the previous year	28 (45%)	29 (47%)	5 (8%)	0.009*
Sleep problems	71 (46%)	78 (50%)	6 (4%)	0.000*
Hearing problems	50 (60%)	33 (39%)	1 (1%)	0.523
Visual problems	101 (49%)	92 (45%)	12 (6%)	0.000*

*$p < 0.05$ by Chi-square test; with 95% confidence interval. SPPB: Short physical performance battery.

Table 4

Gross analysis of multiple logistic regression between depression and sociodemographic variables, functionality, body mass index, cognitive deficit, referred morbidities, reports of falls, low functional performance, sleep, hearing, and visual problems in a sample of urban elderly residents in the sampled community (n=388)

Variables	Gross analysis OR (IC95%)	p-valor
Years of schooling		0,012*
Medium/High (≥8)	1.00	
Low (<8)	2.15 (1.18 – 3.91)	
Basic activities of daily life		0.000*
Independent	1.00	
Partial or total dependency	4.97 (2.35 – 10.49)	
Instrumental activities of daily life		0.003*
Independent	1.00	
Partial or total dependency	1.85 (1.23 – 2.78)	
Five or more diseases	2.93 (1.48 – 5.81)	0.002*
Cardiovascular diseases	1.75 (1.04 – 2.95)	0.034*
Hypertension	1.58 (1.01 – 2.48)	0.045*
Diabetes mellitus	1.65 (1.01 – 2.69)	0.045*
Arthritis	1.89 (1.24 – 2.86)	0.003*
Osteoporosis	1.81 (1.18 – 2.78)	0.006*
Urinary incontinence	2.18 (1.34 – 3.55)	0.002*
Low Performance (SPPB)	1.98 (1.22 – 3.24)	0.006*
Falls in the previous year	1.90 (1.10 – 3.29)	0.021*
Sleep problems (self-report)	2.39 (1.58 – 3.64)	0.000*
Visual problems (self-report)	2.28 (1.50 – 3.45)	0.000*

*p<0.05; OR: Odds ratio; IC95%: interval of 95% confidence limit; SPPB: Short Physical Performance Battery

DISCUSSION

The most significant finding of this study is that depression was associated with a loss of independence, poor sleep quality, and self-reported comorbidities. In this study, it was observed a higher prevalence of depression in the elderly when compared to the national[2] average, which was also found in other studies[29,30].

Women accounted for 64% of the sample and had a higher prevalence of depression. This relationship was found in many different studies, regardless of age[29,30,31,32]. Factors related to female physiological and hormonal differences, low educational level, low income, socio-cultural issues, and the different ways of dealing with stressful situations have been analyzed in an attempt to justify this higher prevalence in women[31,33].

Although our sample does not include institutionalized elderly, the risk factor female sex was also predominant in studies with elderly in these scenarios, however, these elderly end to manifest depressive symptoms at older ages, while in our sample the age group with greater depressive impairment was between 65 and 69 years old, emphasizing that care must be comprehensive for this population regardless of the living environment[34,35,36].

The low schooling level and female gender had a strong association with depression, similar to other study[30]. Wu et al.[37] justify that low schooling is a precursor to memory difficulty because of the lack of brain stimulation during daily activities and they believe that mental exercise and the maintenance of social relationships with friends and family can maintain the stimulus and increase

neural growth, avoiding cognitive deficits. In Turkey, Yaka et al.[38] identified risk factors similar to these and believed that social and economic support is essential for the elderly, and that good schooling increases their chances of having better financial security and thus, participate in social activities successfully.

The preservation of functional capacity, i.e., the ability to perform basic and instrumental activities daily, such as eating, bathing, shopping, and taking medicine, has a great influence on the quality of life for the elderly. It also ensures that these people interact with society independently, for a longer period[39]. Our data corroborate these results, showing the elderly with partial or total dependence on the IADLs were more likely to be depressive. Hoffman et al.[40] characterize the relationship between depressive symptoms and functional decline as bidirectional, cause and effect, and they also add sleep difficulty as a factor associated with depression symptoms. Thus, in this study[41], there was an association between sleep quality in elderly patients with osteoporosis and depression.

In the analysis of the elderly senses (vision and hearing), only self-report of any visual impairment proved to be relevant for the development of depression. This relationship was already expected given the impact of this deficit on the performance of daily activities, affecting their functional capacity. In a study on the elderly in Belgium[42], it was found a strong relationship between depression and visual problems, emphasizing that the higher prevalence of depression in the aging population increases the chances of these two events occurring, thus requiring more effective prevention and treatment strategies.

Although senescence does not mean getting sick, this process favors the development of diseases[43], especially the chronic ones due to the increased exposure to stressors, such as long periods of pain[41], nutritional impairment[44], reduced autonomy, and physical mobility in response to physical illness. In this study, the chance the elderly develop depressive symptoms was three times higher when they had five or more diseases, such as cardiovascular diseases, diabetes mellitus, arthritis, osteoporosis, and urinary incontinence. Corroborating these results, other authors also found a strong association among depression, cardiovascular and cerebrovascular diseases[45], and diabetes mellitus[46], and they also indicated the importance of early diagnosis of depression.

Our results showed that the elderly who had sleep difficulty were twice as likely to have depression. In this reasoning, Becker et al.[47] observed that sleep quality is a mediating factor for the development of depression among the elderly, and they reinforce the importance of maintaining a good quality of sleep, especially in old age.

The occurrence of falls in the elderly in the previous year was also associated with depression in our study. This relationship has been analyzed in different places, and this has been repeatedly confirmed[29]. A study[48] assessed 149,876 elderly in the United States and showed that depression is an important risk factor for falls, as well as its recurrence. In a study[49] that analyzed the association of occurrence of previous falls with depression, it was found no significant results for this relationship in the male elderly.

From this analysis, some risk factors, such as reduced functional capacity, falls, and sleep difficulties can be alleviated with the adoption of new lifestyle habits. Reichert et al.[50] observed an inversely proportional relationship between depression and level of physical activity in the elderly, in which the more active ones demonstrated a lower prevalence of depression symptoms. Corroborating this finding, another study[51] found that reduced exercise increases the chances of developing depression and cognitive problems.

As a limiting factor is that the data analyzed in this study came from a cross-sectional survey and, therefore, no causal inferences can be made from our associations.

CONCLUSION

Depression in this group of elderly was mostly associated, at least in part, with modifiable factors. It indicates that depression in the elderly can be positively influenced by changes in habits and preventive interventions of these identified factors. Socialization, regular physical activity, and education should be strategies adopted to prevent depression in the elderly population.

ACKNOWLEDGMENTS

CONFLICT OF INTERESTS

The authors report no conflicts of interest.

REFERENCES

1. World Health Organization. Depression and other common mental disorders: global health estimates. World Health Organization. 2017.

2. IBGE. Pesquisa Nacional de Saúde 2013 [Internet]. Instituto Brasileiro de Geografia e Estatística (IBGE). 2014. 181 p. Available from: ftp://ftp.ibge.gov.br/PNS/2013/pns2013.pdf

3. Razzouk D. Capital mental, custos indiretos e saúde mental. In: Razzouk D, Lima MGA de, Cordeiro Q, editors. Saúde mental e trabalho. 2015. p. 312.

4. Razzouk D, Razzouk D. Por que o Brasil deveria priorizar o tratamento da depressão na alocação dos recursos da saúde? Epidemiol e Serviços Saúde [Internet]. 2016;25(4):845–8. Available from: http://www.iec.pa.gov.br/template_doi_ess.php?-doi=10.5123/S1679-49742016000400845&scielo=S2237-96222016000400845

5. Rogers JP, Chesney E, Oliver D, Pollak TA, McGuire P, Fusar-Poli P, et al. Psychiatric and neuropsychiatric presentations associated with severe coronavirus infections: a systematic review and meta-analysis with comparison to the COVID-19 pandemic. The Lancet Psychiatry [Internet]. 2020 May;(January). Available from: www.thelancet.com/psychiatryPublishedonline

6. Simões CC da S. Relações entre as alterações históricas na dinâmica demográfica brasileira e os impactos decorrentes do processo de envelhecimento da população [Internet]. IBGE; 2016. p. 119. Available from: http://biblioteca.ibge.gov.br/visualizacao/livros/liv98579.pdf

7. Paula F de L. Envelhecimento e queda dos idosos. Apicuri; 2010. 244 p.

8. Prince M, Albanese E, Guerchet M, Prina M. World Alzheimer report 2014 dementia and risk reduction: an analysis of protective and modifiable factors. London Alzheimer's Dis Int. 2014;104.

9. Schlindwein-Zanini R. Demência no idoso: Aspectos neuropsicológicos. Rev Neurociencias. 2010;18(2):220–6.

10. Grinberg LP. Depressão em idosos - desafios no diagnóstico e tratamento [Internet]. Grupo Editorial Moreira Jr. 2006. p. 317–30. Available from: http://www.morei-rajr.com.br/revistas.asp?fase=r003&id_materia=3335

11. Conejero I, Olié E, Courtet P, Calati R. Suicide in older adults: Current perspectives. Clin Interv Aging. 2018;13:701–12.

12. Coutinho FL. Evidências de validade de crédito e convergente relacionada a outras variáveis da Escala Baptista de Depressão para Idosos - EBADEP-ID. 2013;

13. Lima AMP, Ramos JLS, Bezerra IMP, Rocha RPB, Batista HMT, Pinheiro WR. Depressão em idosos: uma revisão sistemática da literatura. Rev Epidemiol e Control Infecção. 2016;6(2).

14. Souza RA, da Costa GD, Yamashita CH, Amendola F, Gaspar JC, Alvarenga MRM, et al. Funcionalidade familiar de idosos com sintomas depressivos. Rev da Esc Enferm. 2014;48(3):469–76.

15. Folstein. Mini-mental state. A grading the cognitive state of patiens for the clinician. J Psychiatr Res. 1975;12:189–98.

16. Apóstolo JLA, Bobrowicz-Campos EM, Reis IAC dos, Henriques SJ, Correia CAV. Capacidade de rastreio da Escala de Depressão Geriátrica com 10 e 5 itens Screening capacity of Geriatric Depression Scale with 10 and 5 items Capacidad de seguimiento de la Escala de Depresión Geriátrica con 10 y 5 ítems. Rev Enferm Ref [Internet]. 2018;29–40. Available from: https://doi.org/10.12707/RIV17062

17. Ferrari JF, Dalacorte RR. Uso da escala de depressão geriátrica de yesavage para avaliar a prevalência de depressão em idosos hospitalizados. Sci med. 2007;17(1):3–8.

18. Tan L, Toh HJ, Sim LK, Low JA. Sensitivity and Specificity Analysis: Use of Emoticon for Screening of Depression in Elderly in Singapore. J Am Psychiatr Nurses Assoc. 2018;24(5):452–6.

19. Sena T. Manual Diagnóstico e Estatístico de Transtornos Mentais - DSM-5, estatísticas e ciências humanas: inflexões sobre normalizações e normatizações. Vol. 11, Revista Internacional Interdisciplinar INTERthesis. 2014. 96 p.

20. Vidgren M, Virtanen JK, Tolmunen T, Nurmi T, Tuomainen TP, Voutilainen S, et al. Serum Concentrations of 25-Hydroxyvitamin D and Depression in a General Middle-Aged to Elderly Population in Finland. J Nutr Heal Aging. 2018;22(1):159–64.

21. Ng A, Tam WW, Zhang MW, Ho CS, Husain SF, McIntyre RS, et al. IL-1β, IL-6, TNF- α and CRP in Elderly Patients with Depression or Alzheimer's disease: Systematic Review and Meta-Analysis. Sci Rep. 2018;8(1):1–12.

22. Ferrari AJ, Charlson FJ, Norman RE, Patten SB, Freedman G, Murray CJ, et al. Burden of depressive disorders by country, sex, age, and year: findings from the global burden of disease study 2010. PLoS Med [Internet]. 2013;10(11):e1001547. Available from: http://www.ncbi.nlm.nih.gov/pubmed/24223526

23. de Oliveira L da SSCB, Souza EC, Rodrigues RAS, Fett CA, Piva AB. The effects of physical activity on anxiety, depression, and quality of life in elderly people living in the community. Trends Psychiatry Psychother. 2019;00(0):1–7.

24. Espinosa MM, Bieski IGC, de Oliveira Martins DT. Probability sampling design in ethnobotanical surveys of medicinal plants. Brazilian J Pharmacogn. 2012;22(6):1362–7.

25. Lipschitz D. Screening for nutritional status in the elderly. Prim Care. 1994;21(1):55–67.

26. Soares WJ de S. Capacidade físico funcional em idosos com e sem história de quedas: projeto fibra. 2009.

27. Press Y, Punchik B, Freud T. The association between subjectively impaired sleep and symptoms of depression and anxiety in a frail elderly population. Aging Clin Exp Res [Internet]. 2018;30(7):755–65. Available from: http://dx.doi.org/10.1007/s40520-017-0837-1

28. Laudisio A, Antonelli Incalzi R, Gemma A, Marzetti E, Pozzi G, Padua L, et al. Definition of a Geriatric Depression Scale cutoff based upon quality of life: a population-based study. Int J Geriatr Psychiatry. 2018;33(1):e58–64.

29. Ramos GCF, Carneiro JA, Barbosa ATF, Mendonça JMG, Caldeira AP. Prevalência de sintomas depressivos e fatores associados em idosos no norte de Minas Gerais: Um estudo de base populacional. J Bras Psiquiatr. 2015;64(2):122–31.

30. Oliveira MF De, Bezerra VP, Silva AO, Alves M do SCF, Moreira MASP, Caldas CP. Sintomatologia de depressão autorreferida por idosos que vivem em comunidade. Cien Saude Colet [Internet]. 2012;17(8):2191–8. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22899159

31. Stopa SR, Malta DC, Oliveira MM de, Lopes C de S, Menezes PR, Kinoshita RT. Prevalência do autorrelato de depressão no Brasil: resultados da Pesquisa Nacional de Saúde, 2013. Rev Bras Epidemiol [Internet]. 2015;18(suppl 2):170–80. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1415-790X2015000600170&lng=pt&tlng=pt

32. Aly HY, Hamed AF, Mohammed NA. Depression among the elderly population in Sohag governorate. Saudi Med J. 2018;39(2):185–90.

33. Gonçalves AMC, Teixeira MTB, Gama JR de A, Lopes CS, Silva GA e, Gamarra CJ, et al. Prevalência de depressão e fatores associados em mulheres atendidas pela Estratégia de Saúde da Família. J Bras Psiquiatr [Internet]. 2018;67(2):101–9. Available from: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0047-20852018000200101&lng=pt&tlng=pt

34. Vaz S, Gaspar N. Depressão em idosos institucionalizados no distrito de Bragança. Rev Enferm Ref. 2011;III Série(nº 4):49–58.

35. Frade J, Barbosa P, Cardoso S, Nunes C. Depressão no idoso: sintomas em indivíduos institucionalizados e não-institucionalizados Depression in the elderly: symptoms in institutionalised and non-institutionalised individuals Depresión en los ancianos: síntomas en individuos

institucionalizados y. Abstr Resum [Internet]. 2015;41–9. Available from: http://www.scielo.mec.pt/pdf/ref/vserIVn4/serIVn4a05.pdf

36. Silva ER e, Sousa ARP, Ferreira LB, Peixoto HM. Prevalência e fatores associados à depressão entre idosos institucionalizados: subsídio ao cuidado de enfermagem. Rev da Esc Enferm da USP [Internet]. 2012 Dec;46(6):1387–93. Available from: www.scielo.br/reeusp%5CnSilva

37. Wu M-S, Lan T-H, Chen C-M, Chiu H-C, Lan T-Y. Sociodemographic and health-related factors associated with cognitive impairment in the elderly in Taiwan. BMC Public Health [Internet]. 2011;11. Available from: http://www.scopus.com/inward/record.url?eid=2-s2.0-78651067653&partnerID=40&md5=f-5f81133e90b7fee616ef0f971712f24

38. Yaka E, Keskinoglu P, Ucku R, Yener GG, Tunca Z. Prevalence and risk factors of depression among community dwelling elderly. Arch Gerontol Geriatr. 2014;59(1):150–4.

39. Machado FN. Capacidade e desempenho para a realização das atividades básicas de visa diária: um estudo com idosos dependentes. 2010;130.

40. 40. Hoffmann EJ, Ribeiro F, Farnese JM, Lima EWB. Sintomas depressivos e fatores associados entre idosos residentes em uma comunidade no norte de Minas Gerais, Brasil. J Bras Psiquiatr. 2010;59(3):190–7.

41. Kasapoğlu Aksoy M, Aykurt Karlibel İ, Dülger S, Altan L. Sleep Quality in Osteoporotic Elderly: Relationship to Pain Sensitıvity and Depression. Int J Depress Anxiety. 2019;1(1).

42. van der Aa HPA, Comijs HC, Penninx BWJH, van Rens GHMB, van Nispen RMA. Major Depressive and Anxiety Disorders in Visually Impaired Older Adults. Invest Ophthalmol Vis Sci [Internet]. 2015;56(2):849–54. Available from: http://iovs.arvojournals.org/Article.aspx?doi=10.1167/iovs.14-15848

43. Ferrucci L, Guralnik JM, Studenski S, Fried LP, Cutler GB, Walston JD. Designing Randomized, Controlled Trials Aimed at Preventing or Delaying Functional Decline and Disability in Frail, Older Persons: A Consensus Report. J Am Geriatr Soc. 2004;52(4):625–34.

44. Boyanagari V, Panda P, Boyanagari M, Panda S. Assessment of nutritional status, psychological depression, and functional ability of elderly population in South India. Arch Ment Heal [Internet]. 2018;19(2):150. Available from: http://www.amhonline.org/text.asp?2018/19/2/150/248876

45. Silva AR, Sgnaolin V, Nogueira EL, Loureiro F, Engroff P, Gomes I. Doenças crônicas não transmissíveis e fatores sociodemográficos associados a sintomas de depressão em idosos. J Bras Psiquiatr. 2017;66(1):45–51.

46. Defrancesco M, Pechlaner R, Kiechl S, Willeit J, Deisenhammer EA, Hinterhuber H, et al. What Characterizes Depression in Old Age? Results from the Bruneck Study. Pharmacopsychiatry. 2018;51(4):153–60.

47. Becker NB, Jesus SN de, Viseu JN, Stobäus CD, Guerreiro M, Domingues RB. Depresión y calidad de vida en adultos mayores: mediación de la calidad del sueño. Int J Clin Heal Psychol [Internet]. 2018 Jan 1 [cited 2018 Aug 15];18(1):8–17. Available from: https://www.sciencedirect.com/science/article/pii/S1697260017300686

48. Paliwal Y, Slattum PW, Ratliff SM. Chronic Health Conditions as a Risk Factor for Falls among the Community-Dwelling US Older Adults: A Zero-Inflated Regression Modeling Approach. Biomed Res Int [Internet]. 2017;2017:no pagination. Available from: http://www.hindawi.com/journals/biomed/%0Ahttp://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emedx&NEWS=N&AN=615615750

49. Stuart AL, Pasco JA, Jacka FN, Berk M, Williams LJ. Falls and Depression in Men: A Population-Based Study. Am J Mens Health. 2018;12(1):14–8.

50. Reichert CL, Diogo CL, Vieira JL, Dalacorte RR. Physical activity and depressive symptoms in community-dwelling elders from southern Brazil. Rev Bras Psiquiatr. 2010;33:165–70.

51. Yuenyongchaiwat K, Pongpanit K, Hanmanop S. Physical activity and depression in older adults with and without cognitive impairment. Dement Neuropsychol. 2018;12(1):12–8.