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Association between depression and quality of life among Brazilian older adults in long-term care facilities

Asociación entre depresión y calidad de vida entre adultos mayores brasileños en centros de atención a largo plazo

Associação entre depressão e qualidade de vida entre idosos brasileiros em instituições de longa permanência

Marina Celly Martins Ribeiro Souza
Nicholas Acuna
Natália de Cássia Horta
Carolina Marques Borges
Tatiana Teixeira Barral Lacerda

ABSTRACT: This study aims to test the association between geriatric depression and the quality of life of older adults in long-term care facilities in Brazil. Results showed that there was a significant correlation among four of the six domains that were measured in the WHOQOL-OLD questionnaire of those demonstrating symptoms and those without. In conclusion, higher depression scores were reported by participants who had lower quality of life scores. Mental health care should be carefully addressed among institutionalized older adults in long-term facilities.
Keywords: Geriatric; Long-term care facilities; Quality of life; Depression, Brazil.

RESUMEN: *Lo objectivo es probar la asociación entre la depresión geriátrica y la calidad de vida de los adultos mayores en centros de cuidados a largo plazo en Brasil. Los resultados mostraron que hubo una correlación significativa entre cuatro de los seis domínios que se midieron em el cuestionario WHOQOL-OLD de aquellos que muestram sintomas y los que no. En conclusión, los participantes que tenían puntuaciones de calidad de vida más bajas informaron puntuaciones de depresión más altas. La atención de la salud mental debe abordarse cuidadosamente entre los adultos mayores institucionalizados en instalaciones a largo plazo.*
Palabras clave*: Geriatria; Instalaciones a largo plazo; Calidad de vida; Depresión; Brasil.*

RESUMO*: Este estudo tem como objetivo testar a associação entre depressão geriátrica e qualidade de vida de idosos em instituições de longa permanência no Brasil. Os resultados mostraram que houve uma correlação significativa entre quatro dos seis domínios que foram medidos no questionário WHOQOL-OLD daqueles que demonstraram sintomas e aqueles sem. Em conclusão, escores mais altos de depressão foram relatados pelos participantes que apresentaram escores mais baixos de qualidade de vida. Os cuidados de saúde mental devem ser cuidadosamente tratados entre idosos institucionalizados em instalações de longo prazo.*
Palavras-chave*: Geriatria; Instituições de assistência a longo prazo; Qualidade de vida; Depressão, Brasil.*

Introduction

It has been predicted that Brazilian population will have a considerable change in its current population structure in which 18.6% and 33.7% of Brazilian adults will be 60 years or older by the years of 2030 and 2060 respectively (Instituto Brasileiro de Geografia e Estatística, 2015). In terms of population, Brazil currently has 207 million inhabitants, which roughly 26 million (12.5%) Brazilian living in the country are 60 years of age or older (World Bank, 2018). An important initiative towards a better comprehension of the aging process in Brazil is the ongoing cohort ELSI-Brazil - The Brazilian Longitudinal Study of Aging which is a nationally representative study of aged 50 years or older.

The mean age of participants at baseline was 62.2 years old and the most prevalent pre-existing health conditions were arthritis (21%) and diabetes (15.8%) (Lima-Costa, *et al*., 2018).

Increase of overall life conditions such as housing, education, access to healthcare, and advances in medicine in countries such as Brazil have increased significantly and as a result, people are living longer than previously (Tolson, *et al*., 2011; World Health Organization, 2008). The speed of aging in Brazil faces the challenges that come with the burden of social inequalities. Brazil is the seventh economy in the world that had experienced economic and social progress in the past decade lifting approximately 29 million people out of poverty (Instituto Brasileiro de Geografia e Estatística, 2015). The income level of the poorest 40% of the population rose, on average, 7.1% between 2003 and 2014, compared to a 4.4% income growth for the population as a whole. However, the rate of reduction of poverty and inequality appears to have stagnated since 2015 (Instituto Brasileiro de Geografia e Estatística, 2015). As people continue to age, their dependence on others may also increase making it difficult for them to perform daily functions on their own because of their medical complexities or limitations (Pershaw, *et al*., 2016). Long-term care facilities (LTCFs) such as nursing homes and senior centers, among others, provide care for people who are disabled, sick or that cannot be cared for at a residence, and also do not require expensive hospital resources (Sahyoun, *et al*., 2001). As many families can no longer keep up with the services of a family member, the number of LTCFs has been increasing significantly in the past years in Brazil (Lacerda, *et al*., 2017).

Institutionalization has been associated with several negative health outcomes like depression. For instance, the rates of depression are generally higher among older adults living in LTCFs than older adults that live in the community (Meeks, *et al*., 2015). Depression is characterized as difficult to respond correctly to cognitive tests and usually is accompanied by psychomotor retardation, subjective experiences of memory loss (Yesavage, *et al*., 1983). One study indicated that for major depression the prevalence rate is 20% and depressive symptoms it is at 50% among older adults over 70 years old (Barca, *et al*., 2010). In addition, while facilities may have the resources to detect depression symptoms, one study showed that 42% of older adults who resided in long-term care facilities had undetected depressive symptoms (Damian, *et al.,* 2010) including dehydration, weight loss, a decline in participation of daily activities, and higher mortality (Reichman, & Katz, 2009).

Evidence has shown that depression negatively impacts self-reported Quality of Life (IsHak, *et al*., 2014). Quality of Life (QOL) quality of life (QOL) represents the individual's subjective evaluation of physical, mental, and social domains (World Health Organization, 1997). This study aims to test the association between overall quality of life and depression among institutionalized older adults

Methods

This is a population base representative cross-sectional study conducted in the Metropolitan Area of Belo Horizonte, Minas Gerais state, which is the third largest urban agglomeration in Brazil. Simple random sampling was used in two stages, first identifying and contacting all 170 LTCFs existing in the Metropolitan Area of Belo Horizonte. The second stage was assessing the number of total residents of the 156 LTCFs that decided to be part of our study comprising 625 individuals aged 60 years or older. From the 156 LTCFs that agreed to participate in the study, the sample was composed of 28 philanthropic and 16-private LTCFs leading to a total of 44 institutions. Thus, considering: a) the total of 625 older adults living in LTCFs, and therefore eligible to participate; (b) a prevalence of 58% of older adults living in LTCFs for quality of life assessed through the WHOQOL-BREF instrument, which is based on a pilot study that was carried out with the entire population of one of these municipalities; c) an estimation error of 10% and a 90% confidence level; a minimum sample of 119 individuals was needed in order to conduct his research study.

The data collection was administered in the period from December 2016 to June 2017 by 18 members of the research group after acceptance of the older adult in participating in the study through the signing of the Informed Consent Form and approval of the Brazilian National IRB (CAAE: 31471114.4.0000.5137). Before the application of the instruments, a lottery was carried out among the older adults in all of the 44 LTCFs, one institution at a time, and then a cognitive screening instrument, the Mental State Mini Exam (MMSE) was applied to the randomized participants as an inclusion criterion. In situations of not reaching the minimum score, another participant was drawn until the sample calculation was surpassed.

To be included in the study, the participant must be over 60 years old, didn´t show signs of cognitive impairment and had interest in participating in the study. Participants with disabling visual and/or hearing deficits to perform the tests were excluded or with acute/chronic degenerative diseases in an advanced stage. A total of 127 older adults were deemed eligible and recruited for this study.

Instruments and variables

Mental State Mini-Exam [MMSE]

MMSE is an important screening tool, being used worldwide and its reliability is confirmed in several comparisons with other tests (Bertolucci, *et al*., 1994; Brucki, *el al*., 2003*).* The application of MMSE was used because this instrument identifies possible low cognition related to mental functions such as (a) temporal and spatial orientation, (b) immediate and late recall of words, (c) attention, (d) language and (e) visual and spatial construction (da Costa, *et al*., 2008). The MMSE has reliability of screening and not of diagnosis. It was also used as follow-up and evolution of several mental pictures or still as guiding of the process of rehabilitation. The MMSE was validated for the Brazilian population (Brucki, *et al*., 2003) and has a score ranging from 0 to 30 points, indicating the highest degree of cognitive impairment or best cognitive ability respectively (Bertolucci, *et al*., 1994). The Mini Mental State Examination (MMSE) was designed to be a practical clinical assessment of cognitive impairment in geriatric patients, but it cannot be employed to diagnose dementia.

Quality of life (QOL)

The Brazilian World Health Organization Quality of Life-OLD (WHOQOL-OLD) was used to assess quality of life among participants. The WHOQOL-OLD consists of 24 questions divided into six facets forming an additional domain that incorporates issues related to aging, the additional facets are: Functioning of the Senses, Autonomy, Past, Present and Future Activities, Social Participation, Death and Dying, and Intimacy (Fleck, *et al*., 2006).

The higher the score is indicative of a higher the quality of life. In addition, the instrument can be self-administered and is a preferred measurement tool used in cross-sectional studies (Bowling et al, 2011). WHOQOL-OLD proved to be a useful tool and with good psychometric performance in investigating quality of life in the Brazilian older adults (Fleck, *et al*., 2006).

Geriatric Depression Scale (GDS)

The Geriatric Depression Scale (GDS) is a useful tool for detecting depressive symptoms in the older adult population. Originally developed in the English language by Yesavage and Brink, *et al*. (1983), it consisted of 30 items (Yesavage, *et al*., 1983). In 1986, a reduced version with 15 items and this was of great importance in clinical practice as this version requires less time for its administration (Sheikh, & Yesavage, 1986). It was translated and adapted for the Brazilian population in 1999, by Almeida and Almeida (1999); in this study it obtained a cut-off point 5/6, sensitivity of 85.4% and specificity of 73.9% (Almeida, & Almeida, 1999). The scale provides wide acceptance in a clinical and research environment, presenting an easy-to-understand methodology, answer in dichotomous format (yes / no), can be self-applied or applied by an examiner, is efficient and low cost, if properly employed, can to become a valuable public health tool in the tracking and control of these conditions in non-specialized environments (Almeida, & Almeida, 1999).

Self-perception of health

A measure of the health status used since 1950 in gerontological research is the self-perception of health, presenting as a mediating role between human biology and psychology, being related to functional decline and being pointed as a strong indicator of mortality (Jylha, *et al.*, 1998). To determine self-rated health, individuals are asked how they rates their health in the last few days and provide them choices of: very bad, bad, fair, good, and very good (Jylha, *et al.*, 1998). Thus, self-perception of health encompasses an interpretative process to which the individual can encompass biological, psychosocial and social conditions, that is, any information that the individual recognizes as pertinent to the state of health.

Therefore, it is a subjective measure, being a general survey referring to all the dimensions of health pointed out by the evaluated individuals. It stands out as a relevant outcome for gerontological research, since it is simple, short and global (Jylha, *et al*., 1998).

Statistical Analysis

A simple linear regression model was used and adjusted for gender, age, marital status, schooling, length of schooling, self-perceived health, and MMSE were used to assess the relationship of quality of life (WHOQOL) and depression symptoms (GDS). In order to evaluate the relation between presence of depressive symptoms and age, marital status, schooling, length of schooling, self-perception of health was used the multinomial regression model. The analyzes were performed in STATA software (Stata Corporation, College Station, Texas) version 12.0, considering a level of 5% significance.

Results

The overall distribution of participant's GDS scores are shown in Figure 1. Of the 127 older adults, 54.3 % scored between 0 to 5; 32.3% scored between 6 to 10, and 13.4% scored between 11 to 15.

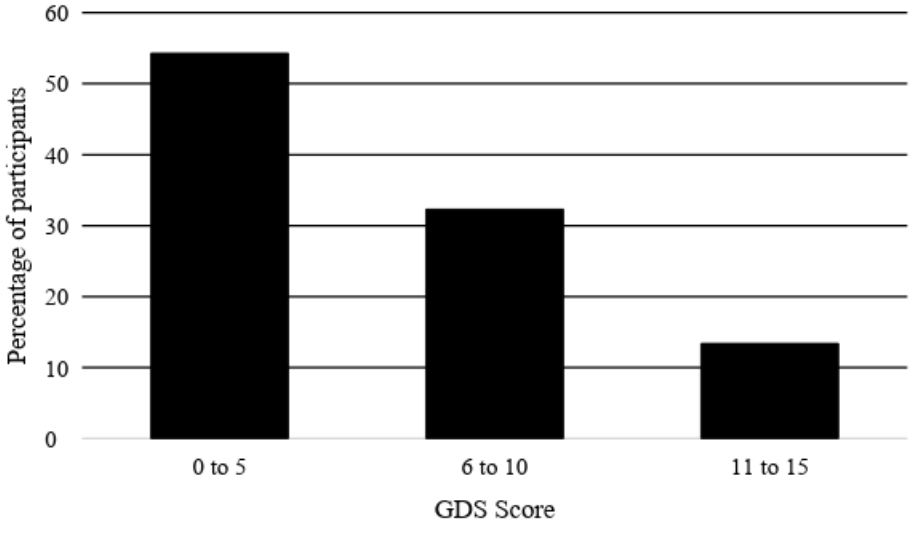

Figure 1. Overall distribution of participant's scores on the Geriatric Depression Scale (GDS)

After adjusting for age, sex, marital status, schooling, self-perception of health and MMSE scores, participants scoring between 6 to 10, on average, had scored 37.9 points lower than those scoring between 0 to 5 in the OLDQV evaluated by WHOQOL-OLD (p= 0.026; 95% CI= -71.21; -4.60). In addition, after adjusting for age, sex, marital status, schooling, self-perception of health and MMSE scores, participants scoring between 11 to 15, on average, had scored 79.9 points lower than those scoring between 0 to 5 in the OLDQV evaluated by WHOQOL-OLD (p= 0.001; 95% CI= -124.84; -34.89).

Subdomains within WHOQOL-OLD when comparing mild depressive symptoms to no depressive symptoms participants scored 17.66 points lower in past, present, and future activities (p<0.001; 95% CI= -25.76; -9.57), 9.67 points lower in social participation (p=0.013; 95% CI= -17.29; -2.05), and 14.46 lower in intimacy (p=0.007; 95% CI= -24.8; -4.11).

Subdomains within WHOQOL-OLD when comparing severe depressive symptoms to no depressive symptoms participants scored 16.83 lower in autonomy (p=0.012; 95% CI= -28.64; -3.62), 29.54 lower in past, present, and future activities (p<0.001; 95% CI= -40.47; -18.61), 28.39 lower in social participation (p<0.001; 95% CI= -38.68; -18.10), and 22.16 lower in intimacy (p=0.002; 95% CI= -36.12; -8.19).

Table 1. Association between quality of life (WHOQOL-OLD) and its subdomains according to depressive symptoms (GDS)*

Variables	GDS 6 - 10					GDS 11- 15				
	Coefficient	Std. Error	p-value	95% CI		Coefficient	Std. Error	p-value	95 % CI	
				lower	upper				lower	upper
OLDQV	-37.9	16.8	0.026	-71.20	-4.60	-79.9	22.7	0.001	-124.84	-34.89
Sensory Skills	3.16	4.16	0.449	-5.09	11.41	5.73	5.62	0.311	-5.42	16.88
Autonomy	-8.27	4.67	0.079	-17.53	0.99	-16.13	6.31	0.012	-28.64	-3.62
Past, Present, Future Activities	-17.66	4.08	<0.001	-25.76	-9.57	-29.54	5.51	<0.001	-40.47	-18.61
Social Participation	-9.67	3.85	0.013	-17.29	-2.05	-28.39	5.19	<0.001	-38.68	-18.1
Death & Dying	9.01	5.90	0.130	-2.69	20.71	10.62	7.97	0.186	-5.18	26.42
Intimacy	-14.46	5.22	0.007	-24.8	-4.11	-22.16	14.99	<0.001	53.00	112.42

* Adjusted for age, sex, marital status, schooling, length of schooling, self-perceived health and MMSE

There was no association between age, marital status, length of schooling with depressive symptoms. However, participants who perceive their health to be regular/bad are 3.23 times more likely to have mild depressive symptoms when compared to those individuals who rated their health good/very good (p=0.004; 95% CI=1.44; 7.22). Older adult who rated their health as regular/poor are 10.67 times more likely to have moderate to severe depressive symptoms when compared to people who rated their health as good/very good.

Table 2. Depressive symptoms (GDS) distribution according to participants sociodemographic characteristics

	GDS 6 - 10					GDS 11 - 15				
	Odds Ratio	Std. Error	p-value	95% CI		Odds Ratio	Std. Error	p-value	95% CI	
				upper	lower				upper	lower
Age Range										
70 to 79	1.03	0.49	0.944	0.41	2.63	0.72	0.45	0.602	0.21	2.48
80 to 89	1.05	0.55	0.933	0.37	2.92	0.53	0.40	0.405	0.12	2.36
90+	0.27	0.31	0.248	0.03	2.50	0.50	0.58	0.552	0.05	4.90
Sex										
Female	1.06	0.42	0.886	0.49	2.30	2.94	1.72	0.065	0.94	2.30
Marital Status										
Married	2.22	1.23	0.150	0.75	6.55	0.91	0.80	0.912	0.16	5.14
Widowed	0.91	0.47	0.848	0.33	2.48	0.45	0.39	0.352	0.09	2.40
Separated/Divorced	0.30	0.21	0.086	0.08	1.18	1.13	0.74	0.848	0.32	4.05
Schooling										
1	1.00	-	-	-	-	1.00	-	-	-	-
2	0.32	0.15	0.012	0.13	0.78	0.75	0.49	0.656	0.20	2.73
3	0.15	0.18	0.104	0.02	1.47	1.30	1.32	0.795	0.18	9.48
4	0.77	0.69	0.765	0.13	4.43	0.00	0.00	0.991	-	-
Self-Perceived Health										
Good/Very Good	1.00	-	-	-	-	-	-	-	-	-
Regular/Poor	3.23	1.33	0.004	1.44	7.22	10.67	7.34	0.001	2.77	41.07
Bad/Very Poor	-	-	-	-	-	1.00	-	-	-	-

Discussion

The implementation of both the WHOQOL-OLD questionnaire and Geriatric Depression Scale allowed for the understanding between the quality of life of older adults and the association of depression. Our hypothesis for this study was that reporting poorer quality of life conditions would demonstrate presence of depression symptoms. The results from this study confirmed our hypothesis. Results showed that there was a significant correlation between four of the six domains that were measured in the WHOQOL-OLD questionnaire of those demonstrating symptoms and those without. In addition, there was a significant correlation between those same domains when it came to participant self-perception of health. Over the years, Brazil has implemented and attempted to increase care of their older adults through their national universal healthcare system known as the Unified Health System (Lini, *et al*., 2015). However, with a growing population of older adults, the demand has reached a point where flaws have arisen such as care not being provided by trained health professionals and low government funding to these facilities (Lini, *et al.*, 2015). This growing population of older adults has grown specifically within long-term care facilities because children of these older adults can no longer support them and fear that they may not be providing all the needs that are required for their parents (Camarano, 2010). Therefore, many are transferring care from their homes to these institutions. With the rise of older adults in long-term care facilities and the lack of support of these facilities from the government, this could be resulting to the poor quality of life that study participants indicated, demonstrating the importance the quality of life of these older adults patients and their risk of being depression due to conditions and social interactions within these long-term care facilities. The findings from this study contribute to the limited literature that connect mental health and quality of life, specifically focusing on the older adult community.

Use of the WHOQOL-OLD and assessment of each of the domains, allowed for precision to find correlations between different variables regarding their age, sex, marital status, educational level, time in the institution, depression, and self-perception of health. In this study, depression was the key factor being analyzed by each of the individual domains using the Geriatric Depression Scale. Specifically, social participation showed a stark difference amongst the two groups.

The amount of interactions older adults have with others, how lonely they are, and the support they have in these facilities shows consistent to other studies showing older being depressed (Jongenelis, *et al*., 2004). However, studies have shown that the implementation of recreation activities such as art, sports, and leisure activities could increase social participation and help reduce the burden of mental health illnesses in these communities (Amiri, *et al*., 2017).

Additionally, there was a significant association between depression symptoms and the way participants viewed their own health. Many viewed their health as regular/poor with the higher GDS score than those with lower GDS scores. Individuals who live with depression among older adults express that they are aware that their own health is poor when compared who do not demonstrate symptoms (Machon, *et al*., 2016). Many individuals living within these long-term care facilities were primarily sent due to families not being able to adequately provide medical attention in their homes and thus sent them to a place where they can receive that attention. It is also known that many older adults in long-term care facilities are living with various chronic diseases. These comorbidities could be hindering older adults from performing daily activities that they were once able to do. Therefore, promoting health lifestyles and programming on an active lifestyle on this aging population could be an effective intervention to combat this issue (Machon, *et al*., 2016).

Limitations

This study has several limitations. Out of the 346 older adults who lived in these nursing homes, only 127 were able to participate in the study. Those who were not able to participate did not meet the criteria of passing the Mini-Mental State Examination (MMSE), as this serves as an indication of cognitive impairment. Therefore, increasing the size to other regions in Brazil would strengthen statistical analyses and provide better generalizability. Another limitation from this study includes that this study used the Geriatric Depression Scale as a means of indicating an individual's risk of depression. This does not indicate that an individual certainly has depression, but it serves as a preliminary method to explore possible depression in someone as shown in the literature (Sheikh, & Yesavage, 1986). Further studies should include a follow-up with those older adults at risk in a clinical setting in order to provide a medical evaluation on their mental health.

In conclusion, higher depression scores were reported by participants who had the lower quality of life scores. Implications from this study warrant further investigation to understanding this relationship and create policy recommendations. Mental health care should be carefully addressed among institutionalized older adults in long-term facilities and the association of depression could be the forefront to leading to overall improvements in mental health among this population.

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Marina Celly Martins Ribeiro Souza - Graduation in Nursing from the UFMG School of Nursing. Master's degree in Nursing and Doctorate from the UFMG School of Nursing. Currently Associate Professor, The College of New Jersey.
E-mail: desouzam@tcnj.edu

Nicholas Acuna - Research Assistant, Rutgers University. School of Public Health - MPH Program.
E-mail: na594@sph.rutgers.edu

Natália de Cássia Horta – Graduation in Nursing, Federal University of Minas Gerais, UFMG. Master and Doctorate in Nursing, UFMG. Currently Adjunct Professor IV at the Pontifical Catholic University of Minas Gerais, teaching in Nursing and Medicine courses. Coordinator of the Gerontology Specialization Course at PUC Minas.
E-mail: nataliahorta@pucminas.br

Carolina Marques Borges - Associate Professor. Department of Public Health. The College of New Jersey, USA. PhD in Public Health (FO-UFMG) with a period at Harvard School of Public Health (HSPH). Master's degree in Public Health with a degree in Epidemiology from the Federal University of Santa Catarina (UFSC).
E-mail: borgesc@tcnj.edu

Tatiana Teixeira Barral Lacerda - Physiotherapist, Pontifical Catholic University of Minas Gerais, UFMG. Specialist in Physiotherapy Applied to Neurology, UFMG. Master in Rehabilitation Sciences, UFMG (2006). PhD student in Rehabilitation Sciences. Currently professor of Physiotherapy in Neurological Dysfunctions I and II, Health of the Elderly, Musculoskeletal Anatomy and Supervised Internship in Neurological Physiotherapy at the Pontifical Catholic University of Minas Gerais.
E-mail: tatiana.barral@yahoo.com.br