DOI: 10.1590/1413-81232018247.14172017

Biopsychosocial factors associated with disability in older adults with acute low back pain: BACE-Brasil study

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Abstract *This cross-sectional study evaluated the association of biopsychosocial factors with disability in older adults with a new episode of acute low back pain. Older patients with a new episode of acute low back pain were included and those with cognitive alterations and severe motor impairment were excluded. Disability was assessed using the Roland Morris Disability Questionnaire. The biopsychosocial factors (clinical, functional, health status, psychological and social variables) were evaluated by a structured multidimensional questionnaire and physical examination. A multivariate linear regression was used to analyze data with a statistical significance of 0.05. A total of 386 older individuals with a mean age of 71.6 (± 4.2) years and disability of 13.7 (± 5.7) points were enrolled. Our regression analyses identified that worse physical and mental health (assessed through SF-36), low falls self-efficacy, trouble sleeping due to pain, worse kinesiophobia levels, higher body mass indexes, lumbar morning stiffness, increased pain intensity, female gender and worse functional mobility were significantly associated with baseline disability ($p < 0.05$). Low back pain-related disability is significantly associated with worse biopsychosocial health conditions in older adults.*

Key words *Low back pain, Disability, Older adults, Aging*

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Introduction

Low back pain (LBP) is the leading cause of physical disability[1] among adults of all ages. According to data from the World Health Organization (WHO), musculoskeletal morbidities are the conditions with the highest incapacitating burden[2,3]. Of the 209 health conditions, LBP is the morbidity that contributes most to overall disability and ranks sixth in the global burden of disease measured by Disability-Adjusted Life Years (DALYs)[1]. Patients with acute LBP have a higher severity of pain and disability symptoms when compared to people with chronic LBP[4]. In this rationale, it is important to differentiate patients with acute and chronic complaints in research and studies on LBP[5].

The prevalence of LBP of greater severity increases with age[6,7], contributing significantly to the disabilities and deteriorating health conditions already present in the elderly population[8]. Seniors with disabilities are unable to keep up their daily activities and tend to move away from the interaction, adversely affecting their health status[9]. LBP compromises functionality, autonomy and independence of older adults[10] and is one of the most common reasons for seeking primary health care[11]. Cayea et al.[11] reported that 36% of the community aged 65 years and over were affected by one LBP episode per year, and of these, 21% sought health care. Moreover, the social and economic costs related to LBP disabilities are significant, further burdening the health and social security system[12].

The definition of disability proposed by the WHO International Classification of Functioning, Disability and Health (ICF) postulates that disabilities related to health conditions are influenced by multiple factors. In ICF, disabilities result from the interaction between dysfunctions in body structure and function, limited activity and restricted social participation, and are also influenced by personal and environmental aspects[13]. Waddell et al. analyzed LBP under the biopsychosocial model[14], and since then, this approach has been disseminated and improved[15,16]. According to the biopsychosocial model, disability in individuals with LBP can be influenced by biological, psychological and socio-environmental aspects, and should be analyzed in this broad and integrative context[14].

The scientific literature highlights the importance of the biopsychosocial model in the approach of LBP in the general population[17-20]. However, on the association of biopsychosocial factors with disability in LBP patients are still limited. The few available data point to the influence of physical, psychological and socio-environmental factors on self-reported disability in adults with acute LBP[19]. In older adults, the only study available on the biopsychosocial and LBP model showed an association of negative biopsychosocial aspects with worse functional results and recommended the use of the biopsychosocial approach in future research on LBP in older adults[18].

However, there are still few studies on LBP and disability in the older population, mainly from a biopsychosocial viewpoint. Thus, it is necessary to investigate the association of biopsychosocial factors with LBP and its consequences among older adults. Thus, this study aimed to identify whether selected biopsychosocial factors were associated with disability in seniors affected by a new episode of acute LBP.

Methods

Study design

This study is part of the international consortium of epidemiological studies Back Complaints in the Elders – BACE, which includes researchers from Australia, Brazil and the Netherlands. The consortium aims to study the clinical, functional, sociodemographic profile, as well as to investigate the course of LBP in seniors of health care services in the countries involved, whose protocol details have been previously published[21]. The BACE-Brasil project (BACE-B) is a prospective cohort study with data collected between October 2011 and September 2015. The recruitment of BACE-B allowed the construction of an extensive database, facilitating both cross-sectional and longitudinal (prospective) analyses. This is an observational cross-sectional study of baseline assessment data from the BACE-B cohort.

The BACE-B study was approved by the Research Ethics Committee of the Federal University of Minas Gerais, and recruited a consecutive sample of older adults with acute LBP complaints and residents of the community of the metropolitan region of Belo Horizonte. Older adults with low back pain symptoms were identified by health professionals (physicians, physiotherapists, occupational therapists, among others) of the public or private service, and were directed to the BACE-B research team. Those who sought the trained team of BACE-B researchers were

screened and invited to participate in the study.

The BACE-B study included older adults with a new episode of LBP. LBP was defined as of complaints of pain, tension or stiffness in the region between the last ribs and the gluteal line, with or without irradiation of pain to the lower limbs (LL)[22]. A new episode of LBP was defined as participants not seeking treatment for LBP in the six months preceding study participation[21]. In turn, acute symptoms were defined as an LBP crisis in the maximum period of six weeks before the baseline assessment[23]. Only older adults with these criteria were included in the BACE-B study.

Participants with visual, motor and hearing impairment or cognitive dysfunctions[24] that could influence their response to questionnaires or performance of physical and functional tests adequately were excluded.

The sample of this study consisted of participants from the baseline of BACE-B aged ≥ 65 years. The selection of this sample considered three aspects: (1) the chronological framework proposed by the WHO that considers older people as those aged 65 or over; (2) easy comparison with international data; (3) the lower variability of the sample due to its greater homogeneity regarding age.

Measurement and procedure tools

Participants evaluated the inclusion/exclusion criteria that agreed to participate in the study, signed the informed consent form and were included in the study. All were submitted to a standardized, structured and multidimensional questionnaire for characterization of the sample and evaluation of LBP complaints. They also performed a physical and functional examination, as per the BACE consortium's guidelines. All detailed procedures have been previously described and published in the BACE[21] consortium's protocol.

The outcome measure of this study was LBP-related disability assessed using the Roland Morris Disability Questionnaire (RMDQ), which consists of 24 items related to the influence of back pains during daily activities and measures the level of disability associated with LBP. The RMDQ score ranges from 0 to 24, with higher scores indicating a worse level of disability. This questionnaire shows good test-retest reliability and among examiners (r = 0.88 and 0.86, respectively)[25,26].

The biopsychosocial factors potentially eligible for association with disability were selected from baseline assessment according to clinical or theoretical relevance. Following the rationale of the biopsychosocial approach for LBP, these factors were categorized as follows: biological, psychological, and sociodemographic/lifestyle factors[14].

Biological factors

(1) LBP intensity in the last week, evaluated by the Numeric Rating Scale (NRS), with a score ranging from 0 (no pain) to 10 (maximum pain); (2) complaints of pain irradiation to LL (yes/no); (3) report of pain during active trunk movements – anterior flexion, lateral flexion and trunk rotation (yes/no); (4) trouble sleeping because of low back pain (yes/no); (5) anterior trunk flexibility assessed by the finger-to-floor distance (FFD) test, which measures the distance in cm from the third finger of one hand to the floor during the maximum anterior flexion of the trunk; (6) positive Lasègue test (yes/no); (7) low back morning stiffness (yes/no); (8) functional mobility, as gauged by the Timed up and Go (TUG), which measures the time in seconds for the elderly to perform the task of getting up from the seated position, to walk three meters, to turn around, to return to the chair and sit down again. Times more significant than 12-14 seconds are associated with an increased risk of falls in the elderly[27]; (9) number of comorbidities, evaluated by self-administered comorbidity questionnaire (SCQ), considering the following morbidities: heart disease, systemic arterial hypertension, pulmonary disease, diabetes, stomach disease, kidney disease, liver disease, blood diseases, cancer, depression, osteoarthritis (hip, knee or hand), rheumatoid arthritis, complaints of pain in the shoulders and cervical spine[28]; (10) physical health, evaluated by the physical realm of the Short Form Health Status Questionnaire-36 (SF-36), consisting of generic questions of physical health status, with a score ranging from 0 to 100, with the lowest values showing worse results[29]; (11) previous history of LBP (yes/no); (12) body mass index (BMI); (13) reported use of medication for LBP in the last 6 weeks (yes/no); (14) visit to a specialist doctor because of LBP in the last 6 weeks (yes/no); (15) low back imaging tests in the last 6 weeks (yes/no).

Psychological factors

(1) Kinesiophobia, evaluated by the Fear-Avoidance Beliefs Questionnaire, which

measures the fear, beliefs and avoidance behaviors of people with LBP. The physical activity subscale, used in this investigation, consists of 4 items, with a score from 0 to 24, where the highest values evidence the worst results[30,31]; (2) depressive symptoms, evaluated by the Depression Scale Center for Epidemiological Studies (CES-D) that addresses issues about mood, somatic symptoms, interactions, and motor functioning. This scale considers symptoms experienced in the last week and the final score ranges from 0 to 60 points, with a cutoff point > 11 considered positive for depressive symptoms in the Brazilian population[32]; (3) mental health, evaluated by the mental realm of the Short Form Health Status Questionnaire-36 (SF-36), composed of generic questions of mental health status, with a score ranging from 0 to 100, with the lowest values representing worse results[29]; and (4) falls self-efficacy, evaluated through the Falls Efficacy Scale - International (FES-I) questionnaire, which registers the elderly's concern with fall during the performance of 16 activities; it has scores ranging from 16 to 64, and the highest score represents a lower sense of self-efficacy in falls[33].

Sociodemographic factors and lifestyle

(1) Age in years; (2) gender (male/female); (3) marital status (categories: married/ common-law marriage, single/divorced, widower); (4) schooling level (categories: low, medium and high); (5) income (categories: low – up to 2 minimum wages, medium – from 2 to 5 minimum wages, and high – 5 or more minimum wages); (6) alcohol use (yes/no); (7) tobacco use (yes/no); (8) paid work (yes/no) and (9) physical activity level in the last week, using the International Physical Activity Questionnaire (IPAQ), which assesses people's level of physical activity in various activities, including those carried out during leisure time, such as traveling from one place to another, domestic chores and occupational activities, and individuals are categorized into three activity levels: inactive, moderately active and active (IPAQ)[34].

Statistical review

Descriptive statistics were used to report the sample characterization data, considering measures of central tendency and frequency of outcomes.

A multivariate linear regression model was constructed to analyze the factors associated with LBP disability. Initially, a bivariate analysis was performed to examine the existence of relationships of the (continuous and dichotomous) independent variables with the variable of disability (outcome). Then, several stepwise multiple linear regression models were used to define the best combination of variables in the final model. The potential explanatory variables were selected by theoretical criteria and included in the regression models as per statistical criteria. All variables with statistical significance ($p \leq 0.2$) in the bivariate analysis were inserted into the regression model, except for the variables age, gender, schooling, which were included in the regression model regardless of the existence of a significant correlation in the bivariate analysis.

The final regression model was defined after verifying and respecting the following assumptions: the presence of a linear relationship between the independent variables and the dependent variable, the independence of the explanatory variables (associated factors); absence of multicollinearity, verified by means of tolerance and the variance inflation factor (VIF); constant variance of errors (homoscedasticity of errors); independent distribution of errors (Durbin-Watson test) and residue normality (graphical analysis and Kolmogorov-Smirnov normality test).

The sample size was calculated with the following formula: $n = 10 \times (K + 1)$, where "K" is the number of explanatory variables included in the multiple regression model and "n" is the size of the study sample. Thus, a minimum sample size of 300 participants was required to perform multiple linear regression analyses with up to 30 explanatory variables. All analyses were performed by the Statistical Package for the Social Sciences (SPSS) for Windows (Version 22.0), and the level of significance was set at 5%.

Results

Elderly Participants from the baseline of the BACE-B cohort were included in our analyses. Figure 1 illustrates the selection process of the participants for this research. The sample consisted of 386 older adults with a mean age of 71.6 ± 4.2 years, mostly females (84.5%), with low levels of schooling (67.6%) and income (71%). Regarding the complaint-related characteristics, older adults had a mean disability of 13.7 (± 5.7) through RMDQ, mean pain intensity of 7.1 (± 2.6) through NRS and mean duration of the new

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LBP episode of 18.9 (± 12.5) days. The descriptive characteristics of the sample are shown in Tables 1 and 2.

The calculated multiple linear regression model enables the prediction of disability levels based on the interaction of multiple explanatory variables. The regression equation found in the final model was [F (10, 366) = 48.813, p <0.000], with an R^2 of 0.622. Thus, approximately 62% of disability variability was explained by the 10 predictors of the regression model. The predictive factors of higher pain intensity (0.7%), trouble sleeping because of LBP (2.8%) occurrence of low back morning stiffness (3.4%) worse functional mobility (2.5%), worse physical health (13.9%), higher levels of BMI (1.9%), kinesiophobia (0.8%), low falls self-efficacy (0.6%), worse mental health (35%) and female gender (0.6%) significantly influenced the disability in the sample investigated. Increased disability levels were associated with worse performance in the biopsychosocial health measures scores in the final multiple linear regression model (Table 3).

Discussion

This cross-sectional study analyzed the association of biopsychosocial factors with disability in seniors older adults with a new episode of acute LBP. Multiple predictive factors were associated with disability in the investigated sample. The multiple regression model identified ten predictive factors that together accounted for 62.2% of disability variability. These data highlight the multifactorial characteristic of disability in older adults with LBP and corroborates data from previous studies on disability in the general population with individuals affected by LBP[35,36].

Recently, a study conducted by the WHO – Study on Global AGEing and Adult Health (SAGE) assessed risk factors for disability in adults and seniors with LBP. The authors included more than 30,000 participants (50.2% aged 50-59 years and 49.8% aged 60 years or older) with LBP in the last 30 days. The risk factors for disability identified were being female, low schooling, a more significant number of comorbidities, higher pain intensity, increased age and low level of physical activity[36]. These data corroborate the results of our study regarding the multidimensionality of disability.

However, differences between the types of factors associated with a disability differ between studies. In this study, disability was not associated with schooling, comorbidities, age and level of physical activity. Differences in the sample profile and questionnaire used to measure dis-

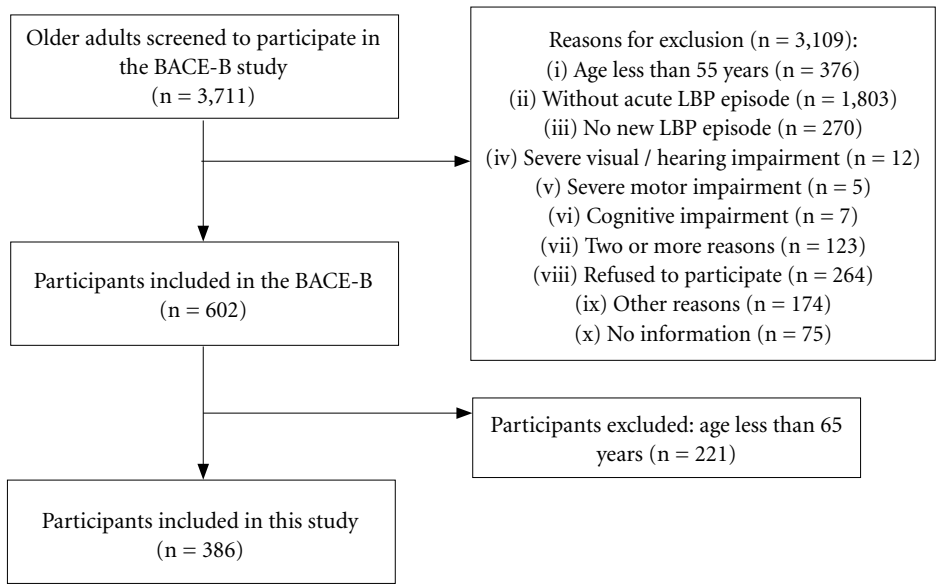

Figure 1. Flowchart of entry of participants in the study.

Table 1. Sociodemographic characteristics and lifestyle of BACE-B participants, 2016, n = 386.

Variables	Continuous	Categorical
	Mean (SD)	n (%)
Sociodemographic factors and lifestyle		
Age	71.6 (±4.2)	-
Gender		
Male	-	60 (15.5)
Female	-	326 (84.5)
Schooling level*		
Low	-	261 (67.6)
Medium	-	74 (19.2)
High	-	50 (13.0)
Income*		
Up to 2 minimum wages (low)	-	274 (71.0)
2-5 minimum wages (medium)	-	59 (15.3)
≥ 5 minimum wages (high)	-	48 (12.4)
Marital status		
Married/Common-law marriage	-	158 (41.0)
Single/divorced	-	108 (28.0)
Widower	-	120 (31.1)
Level of Physical Activity – IPAQ		
Sedentary	-	252 (65.3)
Moderately active	-	109 (28.2)
Active	-	25 (6.5)
Tobacco use		
Yes	-	120 (31.1)
No	-	266 (68.9)
Paid work		
Yes	-	71(18.4)
No	-	315(81.6)
Alcohol use*		
Yes	-	136 (35.2)
No	-	248 (64.2)

SD = Standard Deviation; IPAQ= International Physical Activity Questionnaire; *= the percentage of loss was less than 5% in all variables considered in this investigation, namely, 0.5% for alcohol use, 1.3% for income and 0.3% for schooling level. l activities; FESI = Falls Efficacy Scale – International. ‡= number of variables in the category.

ability may warrant such differences. Stewart et al. (2015) used a generic WHO Disability Assessment Schedule (WHODAS) to assess disability in a mixed population (adults and seniors) with chronic and acute LBP[36], while in this study, a specific questionnaire was used to measure disability only in older adults (65 years or older) with acute LBP[25,26].

Our results showed that higher levels of disability were associated with higher pain intensity through NRS, corroborating similar results from other studies[19,36,37]. patients with more severe LBP may experience greater pain intensity and, consequently, higher levels of disability. This hypothesis is corroborated by the study by Weiner et al.[37], who found a correlation of disability with higher intensity (R = 0.370, p = 0.001) and pain duration (r = -360, p = 003) when evaluating 100 older adults (mean age of 74.3 years) of the chronic LBP community. In this sample, mean values of disability (13.7 ± 5.7) and pain (7.1 ± 2.6) were higher than other studies on LBP with a specific population of the elderly. Jarvik et al.[38] found mean LBP intensity of 5.0 (± 2.8) through NRS and mean disability of 9.5 (± 6.4) through RMDQ in an investigation with 5,239 American older adults (mean age of 73.8 ± 6.9 years) with LBP. Scheele et al.[39] found mean LBP intensity of 4.0 (± 2.8) through NRS and mean disability of 9.8 (± 5.8) through RMDQ in a study of 675 senior Dutch subjects (mean age of 66.4 ± 7.6 years) with a new episode of LBP.

Differences in sample characteristics may warrant such data. Only older adults with an acute LBP episode were included in this study, while seniors with subacute and chronic LBP were also included in the studies with American and Dutch elderly. Usually, patients with subacute and chronic LBP have symptoms of pain and disability of lower intensity than those with acute LBP[4].

Contrary to the results of this study, Stewart et al.[36] did not find an association between obesity and disability, but these authors evaluated obesity using waist circumference (OR = 0.3; p > 0.1). Weiner et al.[37] also found no association of BMI (r = 0.030, p = 0.270) with disability. This study contradicts these data by evidencing the association of BMI and disability in the sample of older adults with acute LBP investigated. In this aspect, it is essential to highlight that the association of BMI with LBP in older adults, while not specifically with disability due to LBP, has already been described[9,10]. These contradictions suggest that the relationship of obesity with LBP is still controversial in the older population.

The variable female gender was associated with disability and remained in the final regression model. Women are known to have more health problems and disabilities. Murtagh & Hubert (2004) described a higher prevalence of health-related disabilities in women than in older men[40]. Chenot et al. (2008) found a higher severity of LBP in women and showed the association of women with low functional capacity and worse prognosis of LBP, including in seniors, who represented 22% of their sample[41]. Thus, we can infer that being female is a negative trait in the population affected by LBP.

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Table 2. Characteristics of low back pain, functionality, disability and health of BACE-B participants, 2016, n = 386.

Variables	Continuous	Categorical
	Mean (SD)	n (%)
Biological factors		
Disability – RMDQ (0-24)	13.7 (±5.7)	-
Pain intensity – NRS (0-10)	7.1 (±2.6)	-
Duration of the new pain episode (0-45 days)	18.9 (±12.5)	-
Irradiation of pain to LL	-	236 (61.5)
Trunk anterior flexibility – FFDT (centimeters)	16.8 (±12.9)	-
Pain to the active movements of the trunk	-	278 (72.0)
Trouble sleeping due to pain	-	168 (43.5)
Low back morning stiffness	-	191 (35.2)
Positive Lasègue test	-	158 (41.1)
Functional Mobility – TUG (seconds)	11.6 (±3.9)	-
Number of comorbidities (0-13)	4.32 (±2.4)	-
Physical health (SF-36) (0-100)	43.3 (±13.3)	-
History of previous low back pain		311 (80.6)
Body Mass Index	28.8 (±5.1)	-
Use of medication for low back pain	-	282 (73.1)
Imaging tests	-	49 (12.2)
Medical expert visits	-	75 (19.4)
Psychological factors		
Mental health (SF-36) (0-100)	42.2 (±8.2)	-
Kinesiophobia – FABQ-Phys (0-24)	15.7 (±6.2)	-
Depressive symptoms – CESD (0-60)	18.5 (±11.9)	-
Falls self-efficacy – FESI (16-24)	31.1 (±9.1)	-

SD = Standard Deviation; RMDQ = Roland Morris Disability Questionnaire; NRS = Numeric Rating Scale; LL = Lower Limbs; FFDT = Finger-Floor Distance Test in cm; TUG = Timed up and Go; FESI = Falls Efficacy Scale - International; SF-36 = Short Form Health Status Questionnaire-36; FABQ-Phys = Fear-Avoidance Beliefs Questionnaire - subscale physical activities; CESD = Center for Epidemiological Studies Depression scale; IPAQ= International Physical Activity Questionnaire

Table 3. Multivariate linear regression analysis between disability and biopsychosocial factors of BACE-B baseline participants, 2016, n = 366.

Variable	Disability				
	Multivariate linear regression (R^2=0.622; F = 48.813; df = 10 of 22; p< 0.001)				
	B(±SE)	β	t	p	R^2
Biological factors (6)‡					
Pain intensity last week	0.217(0.09)	0.100	2.485	0.014	0.007
Trouble sleeping due to pain	1.793(0.47)	0.155	3.806	0.000	0.028
Low back morning stiffness	1.845(0.47)	0.158	4.098	0.000	0.034
Functional Mobility – TUG	0.233(0.06)	0.147	3.778	0.004	0.025
Physical health SF-36	-0.088(0.02)	-0.199	-4.783	0.000	0.139
Body Mass Index	0.159(0.04)	0.142	3.837	0.000	0.019
Psychological factors (3)‡					
Mental health SF-36	-0.237(0.03)	-0.334	-6.963	0.000	0.350
Kinesiophobia – FABQ - Phys	0.081(0.04)	0.090	2.239	0.026	0.008
Falls self-efficacy – FESI	0.077(0.03)	0.124	2.720	0.007	0.006
Sociodemographic factors (1)‡					
Female gender	1.507(0.61)	0.096	2.502	0.013	0.006

R^2 = adjusted coefficient of determination; F = F statistic F; df = degree of freedom; B = unstandardized coefficients; SE = standard error; β = standardized coefficients; t = t statistic t; p = p-value, with 0.05 significance; TUG = Timed up and Go; SF-36=Short Form Health Status Questionnaire-36; FABQ-Phys = Fear-Avoidance Beliefs Questionnaire - subscale physical activities; FESI = Falls Efficacy Scale – International. ‡= number of variables in the category.

The results of this study also showed an association of kinesiophobia with a disability and agree with data from previous studies evaluating older adults with chronic LBP[42-44] and adults with acute LBP[31]. This association between kinesiophobia and disability can be better understood based on the following assumption: the negative experience with pain induces the fear of the onset/increase of pain resulting from movement and, thus, individuals avoid movement/activity, perpetuating the condition of disability[43]. In this perspective, we can suppose that seniors with LBP and kinesiophobic behavior reduce mobility and daily activities, favoring social isolation and incapacities.

Hall et al.[45] showed that approximately 30% of the relationship between LBP and disability are mediated by psychological symptoms. The authors concluded that this relationship also depends on other factors, considering that only 30% of disability variability was explained by psychological questions. Our results corroborate this finding, because although the variable depressive symptoms (evaluated by the CES-D) did not remain in the final regression model, the worst mental health condition (measured by SF-36) was the predictor that mainly explained disability, showing the existence of a significant association of psychological characteristics with the disability in the sample investigated. A vicious cycle is being hypothesized, and the presence of LBP and its disabilities increase mental suffering, influencing the worsening of mental health status. On the other hand, the older adult with a worse state of mental health may have more difficulties in confronting and solving LBP, perceiving higher levels of disability when compared to those without emotional changes[46].

Increased disability was associated with decreased falls self-efficacy (FES-I). Verma & Pal[47] studied a sample of 100 patients with acute LBP (last six weeks), with age ranging from 40 to 73 years, and also found an association between disability and falls self-efficacy. The authors conclude that increased disability in LBP patients was associated with a lower sense of falls self-efficacy[47]. Functional mobility, as assessed by TUG, also showed a negative and significant association with disability, reinforcing data from previous studies that found an association between LBP and decreased functional mobility in older adults[43,48].

Our results evidenced the association of morning stiffness and altered sleep due to pain with increased disability. Previous studies performed in the general population have shown an association of sleep quality patterns[49] and the occurrence of morning low back stiffness with a worse clinical condition in patients with LBP[50]. Frymoyer et al. (1992) emphasized the importance of physical factors in the prediction of disability in patients with LBP[35]; however, we did not find specific studies on sleep disorders or morning stiffness and their relationships specifically with disability in older adults with LBP, hindering their comparison with our results.

Finalizing the analysis of our results, the physical health status, measured by the SF-36 physical realm, was significantly associated with disability. Previous data that indicate the influence of health status on LBP disability are consistent with this result[9,46]. However, it is essential to note that the available literature on LBP in the general population has shown meaningful participation of psychological and social issues in detriment of clinical and biological issues[18-20,37,44]. This is also evident in this study since several biological factors did not show a significant association with disability.

This study presented some limitations that will be discussed below: (1) Participants were recruited consecutively (not randomly), which may contribute to sample selection bias and compromise the generalization of results. Characteristics such as age, gender, the severity of symptoms, access to health services, availability and interest of participants may have influenced the recruitment of participants and produced discrepancies in the sample's representativeness. For example, the sample of this study consisted mostly of women and, even considering the event of feminization of old age, the proportion of women was higher than the expected demographic distribution for the population of older women and men. Thus, there is a need for caution in the generalization of our results. (2) Items of the questionnaire used to measure disability showed similarity with some explanatory factors or items of questionnaires used to measure them.

In this aspect, it is essential to note that, while having a certain similarity, the questionnaires used in this study measure different constructs, show different psychometric characteristics and scores, with validity and reliability already determined in previous publications. Moreover, we used the total scores of the instruments, which minimizes problems with the similarity of items isolated from the questionnaires. We also considered the possibility of multicollinearity during the statistical analysis, and no evidence of a violation of this assumption was found. (3) In

view of the cross-sectional design of this study, it is crucial to consider the possibility of reverse causality, considering that critical factors can be modified by the existence of the disease, and it is not possible to determine what occurred first in cross-sectional studies – whether the exposure or the outcome. Thus, interpretation of results and discussions presented should be understood only as a verification of the association between the variables and cannot be confused with the cause-effect relationship.

Conclusions

This study investigated multiple biopsychosocial factors and their associations with disability in an exclusive sample of older adults with a new episode of acute LBP. We describe the multifactorial interaction of biological, psychological and demographic characteristics with disability, showing discussions and comparisons with available literature. The exploration of this theme in a population commonly excluded from LBP research is innovative and highlights the importance of LBP in the population. We conclude that disability in the older adult with acute LBP is multifactorial and is associated with worse performance in biopsychosocial health measures. Our results contribute to increased scientific knowledge and can be used as a subsidy by health professionals to approach disability in seniors with LBP. However, longitudinal and prospective studies are needed to validate hypotheses and test cause and effect relationships for disability in older adults with LBP.

Collaborations

JP Silva contributed to the design, research, data analysis and interpretation, drafting and approval of the final version of the manuscript. FR Jesus-Moraleida contributed to the research, data analysis and interpretation and approval of the final version. DC Felício contributed to the research, critical review and approval of the final version. BZ Queiroz and ML Ferreira contributed to the conception, critical review and approval of the final version. LSM Pereira contributed to the design, data analysis and interpretation, critical review and approval of the final version.

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Article submitted 06/06/2017
Approved 19/10/2017
Final version submitted 21/10/2017