Influence of Frailty Status on Pain, Disability, and Quality of Life in Older Adults with Acute Low Back Pain: Results from the Back Complaints in the Elders (BACE-Brazil) Study

A.A.O. Leopoldino,[1,2] R.Z. Megale,[3] J.B.M. Diz,[2] B.S. Moreira,[4] D.C. Felício,[5] B.Z. Queiroz,[2] A.C. Bastone,[6] M.L. Ferreira,[7] and L.S.M. Pereira[2]

RÉSUMÉ

Une analyse transversale a été réalisée à l'aide des données provenant d'une étude de cohorte prospective afin de déterminer si la fragilité est associée à l'intensité de la douleur, à une incapacité causée par une douleur au bas du dos et à la qualité de vie chez une population d'adultes âgée souffrant de lombalgie aiguë non spécifique. L'échantillon analysé comprenait six cent deux participants (âge moyen : 67,6 [ET : 7,0 ans]). En ce qui concerne le statut de fragilité, 21,3 pour cent des individus étaient classés comme "robustes", 59,2 pour cent comme "pré-fragiles", et 19,5 pour cent comme "fragiles". Dans l'analyse non ajustée, les groupes pré-fragiles et fragiles ont montré des scores de douleur et d'incapacité significativement plus élevés que le groupe robuste. De plus, les deux mêmes groupes ont affiché des scores inférieurs dans les domaines physique et mental de la qualité de vie, comparativement au groupe robuste. Après ajustement pour les variables sociodémographiques et cliniques, les scores d'invalidité et la composante physique de la qualité de vie étaient significativement associés à la fragilité. Chez les personnes âgées atteintes de lombalgie aiguë, la fragilité est associée à une invalidité plus importante et à des scores inférieurs dans la composante physique de la qualité de vie.

ABSTRACT

A cross-sectional analysis was conducted using data from a prospective cohort study to investigate whether frailty is associated with pain intensity, disability caused by low back pain (LBP), and quality of life in an older population with acute non-specific LBP. Six hundred and two individuals with a mean age of 67.6 (standard deviation [SD] 7.0) years were included in the analysis. In relation to frailty status, 21.3 per cent of the sample were classified as robust, 59.2 per cent were classified as pre-frail, and 19.5 per cent were classified as frail. In the unadjusted analysis, pre-frail and frail groups showed significantly higher pain and disability scores than the robust group. Moreover, the same two groups exhibited lower scores in both physical and mental domains of quality of life than the robust group. After adjusting for socio-demographic and clinical variables, disability scores and the physical component of quality of life were significantly associated with frailty. In older adults with acute LBP, frailty is associated with more disability and worse scores in the physical component of quality of life.

[1] Department of Physical Therapy, Faculdade Ciências Médicas de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

[2] Department of Physical Therapy, Graduate Program in Rehabilitation Science, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

[3] Fundação Hospitalar do Estado de Minas Gerais (FHEMIG), Belo Horizonte, Minas Gerais, Brazil.

[4] Graduate Program in Public Health, Faculty of Medicine, Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil.

[5] Department of Physical Therapy, Universidade Federal de Juiz de Fora, Juiz de Fora, Minas Gerais, Brazil.

[6] Department of Physical Therapy, Graduate Program in Rehabilitation and Functional Performance, Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, Minas Gerais, Brazil.

[7] Institute of Bone and Joint Research, The Kolling Institute, Sydney Medical School, University of Sydney, Sydney, New South Wales, Australia.

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La correspondance et les demandes de tirés-à-part doivent être adressées à : / Correspondence and requests for offprints should be sent to:

Amanda Aparecida Oliveira Leopoldino, Ph.D.
Department of Physical Therapy
Faculdade Ciências Médicas de Minas Gerais
275 Alameda Ezequiel Dias
30130-110, Belo Horizonte
Minas Gerais
Brazil
(aoliveiraleopoldino@gmail.com)

Introduction

Low back pain (LBP) is quite common in older adults and is often associated with impairments in both physical and psychosocial domains (Leopoldino et al., 2016; Wong, Karppinen, & Samartzis, 2017). Some studies have suggested that factors such as advanced age, lower educational attainment, smoking habits, lower economic status, limited access to health services, and presence of multi-morbidities are associated with higher levels of pain and disability in older adults with LBP (Jarvik et al., 2014; Parreira et al., 2017; Stewart Williams et al., 2015); however, little is known about the influence of physical frailty on LBP.

Previous studies have shown an association between frailty and the presence of musculoskeletal conditions, such as osteoarthritis (Castell et al., 2015; Misra et al., 2015), chronic LBP (Coyle, Sions, Velasco, & Hicks, 2015), and chronic musculoskeletal pain (Megale et al., 2018; Shega et al., 2012; Wade et al., 2016). To the best of our knowledge, there is no study addressing the influence of frailty on health outcomes, such as pain intensity, disability, and health-related quality of life (HRQOL), following acute musculoskeletal condition.

Frailty represents a state of vulnerability caused by decreased physiological reserves. As it is known that frail older adults have decreased ability to deal with acute stressors (Chen, Mao, & Leng, 2014), we hypothesized that such individuals might be at risk of experiencing higher levels of pain and more severe disability after an episode of acute non-specific LBP. Therefore, the aim of this study was to investigate whether frailty is independently associated with higher levels of pain and disability and lower HRQOL among older adults seeking care for acute non-specific LBP.

Methods

Study Design and Participants

A cross-sectional analysis was conducted using baseline data from the Back Complaints in the Elders (BACE-Brazil) study, a cohort study addressing the clinical course and prognostic factors related to acute non-specific LBP in older adults. Individuals 55 years of age and older who sought medical care for acute non-specific LBP were invited by physicians or allied health care professionals at primary care settings to contact the Brazilian BACE research team in charge of screening participants for eligibility. Non-specific LBP was defined as any pain without specific cause occurring between the last ribs and inferior gluteal folds, with or without leg pain (Dionne et al., 2008). A new acute episode was defined as one occurring within 6 weeks or less of the enrolment period, which was preceded by no less than a 6-month pain-free period. Participants were excluded if they had any cognitive impairment, severe medical disease, or motor, visual, or hearing loss that would prevent them from being assessed during data collection. A structured multidimensional questionnaire was used to obtain socio-demographic and clinical data. All participants signed an informed consent form. Details on the BACE study protocol have been published elsewhere (Scheele et al., 2011). BACE-Brazil was approved by the Research Ethics Committee of the Universidade Federal de Minas Gerais (ETIC 0100.0.203.00-11).

Independent Variable

Frailty assessment

The presence of frailty was assessed according to the Cardiovascular Health Study (CHS) frailty phenotype (Fried et al., 2001). Frailty was defined as the presence of three or more of the following criteria.

(1) Unintentional weight loss – defined as weight loss greater than or equal to 4.5 kg in the past year.
(2) Self-reported exhaustion – assessed using the questions: "Did you feel that you had to exert yourself to perform your daily tasks?" and/or "Were you not able to carry out your activities?" The answers "most often" or "always" to at least one of such questions indicated the presence of exhaustion.
(3) Low physical activity – defined as being below the lowest CHS quintile score for kilocalories expended per week adjusted for sex. In the BACE-Brazil, kilocalories expended per week were estimated based on

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physical activity level assessed with the Brazilian-Portuguese version of the Active Australia Questionnaire (Rocha et al., 2017).

(4) Weakness – defined as being below the lowest CHS quintile score for grip strength adjusted for sex and body mass index (BMI). Maximal grip strength in the dominant hand (average of three trials) was measured using the JAMAR® dynamometer.

(5) Slowness – defined as time to walk 4.6 m at a usual pace above the sex and height adjusted CHS cut-off points. This test was performed twice, with an interval of 1 minute between repetitions, and the average of the two trials was used for data analysis.

Participants who met one or two of these criteria were classified as pre-frail, and those who had not met any criteria were classified as robust.

Dependent Variables

Pain intensity assessment

LBP intensity was assessed using an 11-point numeric rating scale (NRS) ranging from 0 to 10, where 0 indicates no pain and 10 indicates extreme pain (Mawdsley, Moran, & Conniff, 2002).

Disability assessment

Disability was assessed using the Roland Morris Disability Questionnaire (RMDQ), which consists of 24 questions that address functional limitations resulting from LBP (Costa et al., 2007); the total RMDQ score is the sum of positive responses and ranges from 0 to 24, with higher scores indicating greater disability.

HRQOL assessment

The Medical Outcome Study (MOS) Short Form-36 (SF-36) – Physical Component Summary (PCS), and the MOS SF-36 – Mental Component Summary (MCS) were used to assess HRQOL (Ware & Sherbourne, 1992).

Covariates

Age, sex, marital status, education level, income, BMI, depressive symptoms, and the presence of co-morbidities were used as covariates in statistical models for assessing the association between frailty and pain intensity, disability, or HRQOL. Depressive symptoms were assessed by the Center for Epidemiologic Studies Depression (CES-D) scale, and their presence was defined as a score of 16 or greater on this scale (Lewinsohn, Seeley, Roberts, & Allen, 1997). Co-morbidities were assessed by the Self-administered Comorbidity Questionnaire (SCQ), which addresses 12 self-reported medical conditions (Sangha, Stucki, Liang, Fossel, & Katz, 2003); scores on the SCQ range from 0 to 36, and greater scores indicate a greater co-morbid load.

Data Analysis

Descriptive data of the total sample and frailty subgroups were presented as mean and standard deviation (SD) for continuous variables and absolute (n) and relative (%) frequency for categorical variables. Differences in socio-demographic and clinical data among the three frailty subgroups (robust, pre-frail, and frail) were assessed using analysis of variance (ANOVA) for continuous variables and Fisher's exact test for categorical variables. To assess pairwise differences in continuous variables, post-hoc analysis using a Bonferroni test was performed when statistical differences were detected in the ANOVA test. Simple linear regression models were used to determine unadjusted coefficients for the association between frailty (as an independent variable) and NRS, RMDQ, PCS, and MCS scores (as dependent variables). We conducted a multivariate analysis considering potential confounders to investigate whether the associations between frailty status and pain intensity, disability, or HRQOL were independent of socio-demographic and clinical factors. Three models of multivariate linear regression were used: (1) Model 1: adjusted for socio-demographic variables (age, sex, marital status, education level, and income); (2) Model 2: adjusted for clinical variables (BMI, depressive symptoms, and co-morbidities); and (3) Final model: adjusted for all independent variables that presented a p value < 0.20 in the previous statistical models. The level of significance was set at $p < 0.20$ to ensure that potential associated factors were not excluded. A significant level was considered for all other statistical analyses when the p value was < 0.05. Data were analyzed with the STATA software package, version 13 (StataCorp LP, College Station, TX, USA).

Results

Six hundred and two individuals (84.9% female) with a mean age of 67.6 (SD 7.0) years were enrolled in the BACE-Brazil study. However, 13 participants did not have information for frailty status and were excluded. Therefore, 589 participants composed our analytical sample. According to the CHS frailty criteria, 21.3 per cent of the sample were classified as robust, 59.2 per cent were classified as pre-frail, and 19.5 per cent were classified as frail. The descriptive data of the frailty subgroups at baseline and comparison across robust, pre-frail, and frail subgroups are presented in Table 1. There was a statistically significant difference among frailty subgroups in categorical variables education level, income, depressive symptoms, and obesity. For the continuous variables, the Bonferroni post-hoc test showed differences among all frailty subgroups for the SCQ score (robust vs. pre-frail: $p = 0.001$; robust vs. frail: $p < 0.001$; pre-frail vs. frail: $p = 0.001$) and for BMI there

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Table 1: Baseline characteristics of the study participants and comparison among robust, pre-frail, and frail individuals ($n = 589$)

	Robust ($n = 125$)	Pre-frail ($n = 349$)	Frail ($n = 115$)	p Value
Socio-demographic variables				
Sex (female),[a] *n* (%)	103 (82.4)	301 (86.5)	94 (81.7)	0.332
Age (years),[a] mean (SD)	67.9 (6.7)	67.5 (7.1)	67.7 (7.2)	0.864
Married,[b] *n* (%)	57 (46.0)	157 (45.1)	46 (40.0)	0.584
High school or higher,[b] *n* (%)	57 (45.6)	131 (37.6)	31 (27.2)	0.011
More than the Brazilian minimum wage,[c] *n* (%)[e]	83 (66.4)	206 (60.4)	57 (50.4)	0.041
Clinical variables				
Depressive symptoms (CES-D ≥ 16),[a] *n* (%)	51 (40.8)	240 (69.0)	110 (95.7)	<0.001
SCQ score,[d] mean (SD)	7.8 (3.9)	9.4 (4.3)	11.3 (4.9)	<0.001**
BMI,[a] mean (SD)	27.9 (4.2)	29.4 (5.2)	29.0 (5.9)	0.022***
Obesity,[a] *n* (%)	32 (25.6)	138 (39.7)	42 (36.5)	0.017
Frailty				
Unintentional weight loss, *n* (%)	0 (0)	63 (18.1)	63 (54.8)	<0.001
Self-report exhaustion, *n* (%)	0 (0)	205 (58.9)	112 (97.4)	<0.001
Low physical activity, *n* (%)	0 (0)	96 (27.6)	85 (73.9)	<0.001
Weakness, *n* (%)	0 (0)	124 (35.6)	86 (74.8)	<0.001
Slowness, *n* (%)	0 (0)	18 (5.2)	32 (27.8)	<0.001

Note. **Missing data: [a]0.2%; [b]0.3%; [c]1.7%; [d]13.8%.**
[e] 1 minimum wage in 2014 was $302.80.
**** Bonferroni test: robust versus pre-frail: $p = 0.001$; robust versus frail: $p < 0.001$; pre-frail versus frail: $p = 0.001$.**
***** Bonferroni test: robust versus pre-frail: $p = 0.018$.**
***n* = absolute number; SD = standard deviation; CES-D = Centre for Epidemiologic Studies Depression Scale; SCQ = Self-Administered Comorbidity Questionnaire; BMI = body mass index.**

was a statistical difference only between the robust and pre-frail groups ($p = 0.018$).

The NRS, RMDQ, PCS, and MCS scores stratified by frailty status, as well as the simple linear regression coefficients, are shown in Table 2. Pre-frail and frail participants had significantly higher pain intensity, higher disability levels, and lower scores in both the physical and mental domains of the SF-36 than the robust subgroup. According to our model, NRS scores are expected to be 0.65 (95% confidence interval [CI] 0.12–1.17; $p = 0.016$) and 1.15 (95% CI 0.50–1.80; $p = 0.001$) higher for pre-frail and frail individuals, respectively (robust as reference). Likewise, the RMDQ scores are expected to be 3.83 (95% CI 2.70–4.95; $p < 0.001$) and 7.24 (95% CI 5.84–8.63; $p < 0.001$) higher, the PCS scores are expected to be 3.64 (95% CI 2.08–5.19; $p < 0.001$) and 8.14 (95% CI 6.21–10.01; $p < 0.001$) lower, and the MCS scores are expected to be 6.73 (95% CI 4.07–9.38; $p < 0.001$) and 12.62 (95% CI 9.34–15.91; $p < 0.001$) lower in pre-frail and frail participants, respectively.

The inclusion of socio-demographic and clinical variables in the multivariate linear regression changed the regression coefficients and the statistical significance of the association between frailty status and NRS, RMDQ, PCS, and MCS scores. In model 1, adjusted only for socio-demographic variables, frailty status was still significantly associated with pain, disability, and HRQOL as measured by the PCS and MCS scores (Table 3). Model 2 was adjusted only by clinical variables (BMI, depressive symptoms, and co-morbidities). The inclusion of these variables, particularly depressive symptoms and co-morbidities, might be responsible for the association between frailty status and pain, and between frailty status and the MCS scores being no longer statistically significant (Table 3). The final model of the multivariate linear regression (including all variables that presented a p value < 0.20 in the previous statistical models) showed that frailty status was independently associated only with LBP-related disability and the physical component of HRQOL. The regression coefficients for the association between frailty status and RMDQ scores were 1.68 (95% CI 0.56–2.80; $p = 0.003$) and 3.69 (95% CI 2.19–5.19; $p < 0.001$), and those for the association between frailty status and PCS scores were -2.74 (95% CI -4.37 to -1.12; $p = 0.001$) and -6.50 (95% CI -8.63 to -4.38; $p < 0.001$) for pre-frail and frail participants, respectively (robust as reference). No association between frailty and pain intensity or the mental component of HRQOL was found (Table 3).

Discussion

This study has shown that, in older adults with acute non-specific LBP, frailty status is independently associated with LBP-related disability and the HRQOL physical component, but not with pain intensity or the HRQOL mental component. It was expected that frailty would influence both physical and psychosocial domains; nevertheless, our study shows that only physical domains are sensitive to frailty status.

Previous studies have shown an association between pain intensity and frailty (Nessighaoui et al., 2015),

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Table 2: Mean scores and unadjusted linear regression coefficients for the association between frailty status and numeric rating scale, Roland Morris Disability Questionnaire, and SF-36 Physical and Mental Component Summary scores in individuals with acute low back pain (*n*=589)

	NRS			RMDQ			PCS			MCS		
	Mean (SD)	Coefficient (95% CI)	*p* Value	Mean (SD)	Coefficient (95% CI)	*p* Value	Mean (SD)	Coefficient (95% CI)	*p* Value	Mean (SD)	Coefficient (95% CI)	*p* Value
Robust	6.6 (2.6)	Reference	NA	10.1 (4.9)	Reference	NA	45.3 (7.2)	Reference	NA	48.6 (11.1)	Reference	NA
Pre-frail	7.3 (2.6)	0.65 (0.12, 1.17)	0.016	13.9 (5.6)	3.83 (2.70, 4.95)	<0.001	41.7 (8.0)	- 3.64 (-5.19, -2.08)	<0.001	41.9 (13.7)	- 6.73 (-9.38, -4.07)	<0.001
Frail	7.8 (2.2)	1.15 (0.50, 1.80)	0.001	17.3 (4.7)	7.24 (5.84, 8.63)	<0.001	37.2 (6.9)	-8.14 (-10.01, -6.21)	<0.001	36.0 (12.5)	-12.62 (-15.91, -9.34)	<0.001

Note. **SD = standard deviation; CI = confidence interval; NRS = numeric rating scale; RMDQ = Roland Morris Disability Questionnaire; PCS = physical component summary; MCS = mental component summary; NA = not applicable.**

which could be, in part, mediated by depressive symptoms (Chiou, Liu, Lee, Peng, & Chen, 2018; Sanders, Comijs, Bremmer, Deeg, & Beekman, 2015; Tian et al., 2018). In the BACE study baseline, the adjustment for depressive symptoms was the main reason for not finding a significant association between frailty and pain intensity or SF-36 MCS scores in the multivariate analysis. Our results strengthen the hypothesis that depressive symptoms are important mediators in the association between pain and frailty. It is noteworthy to highlight that the BACE study included only individuals with acute pain, and so it is unlikely that pain had influence on the development of depressive symptoms or frailty in our sample. Conversely, depressive symptoms could have led frail older adults to report higher pain intensity after an episode of acute non-specific-LBP.

There is evidence that frailty and late-life depression in older adults are overlapping syndromes with bidirectional association (Lohman, Dumenci, & Mezuk, 2016; Mezuk, Edwards, Lohman, Choi, & Lapane, 2012). Considering that late-life depression could be, in some patients, an intermediary step in the causal relationship between frailty and pain, the adjustment for depressive symptoms might be incorrect for part of our sample. Frailty and late-life depression have common risk factors, and it is still unclear if depression is a confounder variable in the frailty–pain relationship or if frailty and late-life depression are just different phenotypic expressions of the same underlying pathology.

Education is an important socio-demographic variable and, in our study, it was found to be significantly associated with pain intensity and disability, independent of the presence of frailty status. Low education reflects the deprivation of opportunities and inequality in the health status of older adults throughout their lives (Stewart Williams et al., 2015). Poor socio-economic conditions, little formal education, and low income are characteristics present in more debilitated people, who are more susceptible to health problems, such as frailty (Casale-Martínez, Navarrete-Reyes, & Avila-Funes, 2015). The CHS (n = 5,317) showed an association between frailty, and lower education and income, poorer health, and higher rates of co-morbidities and disability (Fried et al., 2001). In turn, the BACE-Brazil, with 602 older adults, compared groups with different levels of education and income and found that those with 4 years or less of education, and income equal to or less than two minimum wages, had worse scores on disability and pain catastrophizing (Jesus-Moraleida et al., 2018).

The finding that frailty is associated with LBP-related disability and SF-36 PCS scores could be explained by the fact that frailty, by affecting multiple systems and

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Table 3: Multivariate linear regression coefficients for the association between frailty status and numeric rating scale, Roland Morris Disability Questionnaire, SF-36 Physical and Mental Component Summary scores in individuals with acute low back pain (*n*=589)

	NRS		RMDQ		PCS		MCS	
Model 1 Socio-demographic Variables	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**
Pre-frail	0.53 (0.01, 1.04)	0.046	3.51 (2.39, 4.62)	<0.001	-3.20 (-4.74, -1.67)	<0.001	-6.21 (-8.86, -3.58)	<0.001
Frail	1.07 (0.42, 1.71)	0.001	6.72 (5.31, 8.13)	<0.001	-7.46 (-9.40, -5.52)	<0.001	-12.3 (-15.61, -8.10)	<0.001
Age	-0.03 (-0.06, -0.01)	0.032	-0.09 (-0.14, -0.02)	0.009	0.19 (0.10, 0.30)	<0.001	0.20 (0.05, 0.35)	0.011
Sex	-0.88 (-1.50, -0.27)	0.005	-0.73 (-2.01, 0.54)	0.259	2.52 (0.72, 4,32)	0.006	3.74 (0.65, 6.83)	0.018
Married	-0.31 (-0.75, 0.13)	0.174	0.55 (-0.40, 1.50)	0.257	0.25 (-1.07, 1.58)	0.707	2.57 (0.30, 4.83)	0.027
Education	-0.80 (-1.27, -0.33)	0.001	-1.82 (-2.82, -0.81)	<0.001	1.24 (-0.16, 2.64)	0.082	0.68 (-1.73, 3.08)	0.581
Income	0.10 (-0.36, 0.57)	0.658	-0.32 (-1.31, 0.70)	0.534	0.74 (-0.63, 2.10)	0.292	0.74 (-1.61, 3.09)	0.540
Model 2 Clinical Variables	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**
Pre-frail	0.35 (-0.23, 0.94)	0. 234	1.84 (0.72, 2.96)	0.001	-2.61 (-4.30, -9.30)	0.002	-1.22 (-3.89, 1.43)	0.365
Frail	0.68 (-0.10, 1.47)	0.086	3.99 (2.50, 5.49)	<0.001	-6.27 (-8.52, -4.01)	<0.001	-3.15 (-6.74, 0.42)	0.083
BMI	0.01 (-0.03, 0.06)	0.991	0.24 (0.15, 0.32)	<0.001	-1.21 (-2.62, 1.91)	0.090	-0.13 (-2.37, 2.10)	0.908
CES-D	0.55 (0.03, 1.08)	0.038	3.55 (2.55, 4.54)	<0.001	-0.34 (-1.84, 1.17)	0.622	-10.67 (-13.06, -8.28)	<0.001
SCQ	0.08 (0.02, 0.13)	0.006	0.18 (0.08, 0.29)	0.001	-0.36 (-0.51, -0.19)	<0.001	-0.57 (-0.82, -0.30)	<0.001
Final Model	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**	**Coefficient (95% CI)**	***p* Value**
Pre-frail	0.28 (-0.30, 0.86)	0.343	1.68 (0.56, 2.80)	0.003	-2.74 (-4.37, -1.12)	0.001	-1.25 (-3.38, 1.36)	0.346
Frail	0.65 (-0.13, 1.42)	0.103	3.69 (2.19, 5.19)	<0.001	-6.50 (-8.63, -4.38)	<0.001	-2.84 (-6.37, 0.69)	0.114
Age	-0.04 (-0.07, -0.01)	0.051	-0.10 (-0.16, -0.03)	0.004	0.17 (0.06, 0.26)	0.001	0.25 (0.09, 0.38)	0.002
Sex	-0.78 (-1.44, -0.12)	0.021	NA	NA	2.07 (0.17, 3.98)	0.033	2.67 (-0.33, 5.77)	0.081
Married	NA	NA	0.92 (0.04, 1.80)	0.041	NA	NA	NA	NA
Education	-0.82 (-1.29, -0.35)	0.001	-1.65 (-2.55, -0.73)	<0.001	1.03 (-0.46, 2.52)	0.175	NA	NA
Income	NA	NA	NA	NA	1.02 (-0.43, 2.47)	0.167	NA	NA
BMI	NA	NA	1.50 (0.58, 2.43)	0.001	-1.18 (-2,59, 0.21)	0.098	NA	NA
CES-D	0.47 (-0.05, 0.99)	0.078	3.50 (2.48, 4.50)	<0.001	NA	NA	-10.85 (-13.20, -8.50)	<0.001
SCQ	0.06 (0.01, 0.12)	0.033	0.21 (0.11, 0.32)	<0.001	-0.38 (-0.52, -2.01)	<0.001	-0.54 (-0.79, -0.29)	<0.001

Note. **NRS = numeric rating scale; RMDQ = Roland Morris Disability Questionnaire; PCS = physical component summary; MCS = mental component summary; CI = confidence interval; BMI = body mass index; CES-D = Centre for Epidemiologic Studies Depression Scale; SCQ = Self-administered Comorbidity Questionnaire; NA = not applicable.**

diminishing physiological reserves, decreases the ability to maintain functional status after an acute episode of LBP (Fried, Ferrucci, Darer, Williamson, & Anderson, 2004). Therefore, the odds of physical impairments would be increased in individuals who had both conditions simultaneously. The use of CHS frailty phenotype criteria to assess frailty may have played a role in our results. The CHS frailty phenotype criteria identify individuals with physical frailty, which represents a pre-disability condition (Xue, 2011). We wonder if similar results would be found had a multidimensional concept of frailty been used instead.

Although the association between frailty and activities of daily life (ADL) disability has already been established in the literature (Chen et al., 2014; Fried et al., 2001, 2004), our study specifically concerns disability caused by LBP, as assessed by the RMDQ. In addition, previous studies showing an association between frailty and poor HRQOL in older adults did not include only individuals with acute LBP (Chang et al., 2012; Rizzoli et al., 2013). Not only the presence of acute LBP may worsen HRQOL, but poor HRQOL may have an influence on acute LBP.

This study represents the very first step towards understanding the influence of frailty on older adults with acute LBP. Although the influence of age in the course of LBP has been widely investigated in previous research (Stewart Williams et al., 2015; Walker, 2020), the influence of frailty has not been. Age itself is not a good predictor of physiological reserves, as older adults of the same age present with different levels of vulnerability. The follow-up of BACE participants will allow an investigation as to whether frailty is associated with a worse long-term prognosis in terms of recovery from disability and development of chronic LBP. Moreover, it will be possible to determine whether experiencing an episode of acute LBP is associated with future development of frailty in this population.

Strengths and Limitations

Our study has a number of strengths: (1) adequate sample size and power to address all study outcomes, which allowed adjustments for potential confounders and improved the estimates of the regression coefficients; (2) a standardized approach was used to define frailty and all study variables; and (3) this was the first study to investigate the association between frailty and pain intensity, disability, and HRQOL in individuals seeking care for acute LBP. The limitations of this study refer to: (1) the convenience sampling of the BACE-Brazil study, which caused men to be underrepresented in our sample (< 20%); (2) the cross-sectional design that did not allow definitive inferences about the associations found; and (3) the fact that it was not possible to identify whether the same problem that was causing LBP was related to the development of frailty or not.

Conclusion

In older adults with acute non-specific LBP, frailty is independently associated with disability related to LBP and the physical component of HRQOL, but not with pain intensity or the mental component of HRQOL. Longitudinal studies are needed to investigate the influence of frailty status on recovery from LBP-related disability and development of chronic LBP.

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