Disability related to chronic low back pain: prevalence abd associated factors*

INCAPACIDADE RELACIONADA À DOR LOMBAR CRÔNICA: PREVALÊNCIA E FATORES ASSOCIADOS

INCAPACIDAD RELACIONADA CON EL DOLOR LUMBAR CRÓNICO: PREVALENCIA Y FACTORES ASOCIADOS

Marina de Góes Salvetti[1], Cibele Andrucioli de Mattos Pimenta[2], Patrícia Emília Braga[3], Claudio Fernandes Corrêa[4]

ABSTRACT

Disability related to chronic low back pain (CLBP) is a complex and multidimensional phenomenon. The aim of the study was to identify the prevalence of disability and factors associated with disability outcome in 177 CLBP adults. Respondents were recruited from three health care service centers and answered questions from: Demographic Identification Form, Oswestry Disability Index, Chronic Pain Self-efficacy Scale, Tampa Scale Kinesiophobia, Beck Depression Inventory, and the Revised Piper Fatigue Scale. The prevalence of disability among the respondents was 65% (95% CI: 57.5 – 72.0), and disability was moderate to severe in 80.7% of them. The multiple regression model identified three factors as independently associated with disability: work situation, low self-efficacy and depression. The factors identified to be associated with disability are modifiable. Interventions such as work relocation, depression treatment and re-conceptualization of self-efficacy may have an important impact in preventing and reducing disability in chronic low back pain patients.

DESCRIPTORS

Low back pain
Prevalence
Disabled persons
Work
Depression
Self efficacy

RESUMO

A incapacidade relacionada à dor lombar crônica (DLC) é um fenômeno complexo e multifatorial. O objetivo desse estudo foi identificar a prevalência e os fatores associados à incapacidade em pacientes com dor lombar crônica. Estudo transversal com amostra composta por 177 pacientes com DLC, de três serviços de saúde; que responderam ao formulário com dados demográficos, ao Inventário de Depressão de Beck, às Escalas Oswestry Disability Index, de autoeficácia para dor crônica, Tampa de Cinesiofobia e de Fadiga de Piper. A prevalência de incapacidade foi de 65% (IC95%: 57,5 – 72,0) e era de moderada a grave em 80,7% dos pacientes. O modelo de regressão múltipla identificou três fatores independentemente associados à incapacidade: ausência de trabalho remunerado, autoeficácia baixa e depressão. Os fatores associados à incapacidade identificados são modificáveis. Intervenções como recolocação no trabalho, tratamento para a depressão e reconceitualização da crença de autoeficácia podem ter um impacto importante na prevenção e redução de incapacidade.

DESCRITORES

Dor lombar
Prevalência
Pessoas com deficiência
Trabalho
Depressão
Autoeficácia

RESUMEN

La discapacidad relacionada con el dolor lumbar crónico (DLC) es complejo y multifactorial. El objetivo fue identificar la prevalencia y factores asociados a la discapacidad en pacientes con DLC. Estudio transversal con 177 pacientes de tres servicios de salud; que respondieron al formulario con los datos demográficos, Inventario de Depresión de Beck, Escala de discapacidad de Oswestry, autoeficacia para el dolor crónico, Tampa kinesiophobia and Piper fatiga. La prevalencia de la discapacidad fue del 65% (IC 95%: 57,5 a 72,0) y de moderada a severa en 80,7% de los pacientes. El modelo de regresión se identificó tres factores independientemente asociados con la discapacidad: la falta de trabajo, baja autoeficacia y la depresión. Los factores identificados son modificables. Intervenciones como el trabajo de sustitución, el tratamiento de la depresión y la reconceptualización de la creencia de la autoeficacia puede tener un impacto importante en la prevención y reducción de la discapacidad.

DESCRIPTORES

Dolor de la región lumbar
Prevalencia
Personas con discapacidad
Trabajo
Depresíon
Autoeficacia

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[1]RN. Ph.D. in Nursing. Professor, Nursing Department, School of Medical Sciences, Campinas State University. Campinas, SP, Brazil. mgsalvetti@hotmail.com [2]RN. Ph.D., Full Professor, Medical-Surgical Nursing Department, University of São Paulo School of Nursing. São Paulo, SP, Brazil. parpca@usp.br [3]Mathematician. Ph.D. in Epidemiology. Post-Doctoral degree, University of São Paulo School of Nursing. São Paulo, SP, Brazil. [4]Neurosurgeon. Ph.D. in Neurosurgery. Head of the Pain Clinic, Hospital 9 de Julho. São Paulo, SP, Brazil.

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INTRODUCTION

Disability related to chronic low back pain (CLBP) is a complex and multifactorial phenomenon, associated with high social and health costs[1]. This complexity can be explained by the interaction among the many variables that determine disability. The high costs are associated with productivity losses, leaves of absence from work and health system spending.

The prevalence of chronic low back pain ranges between 9% and 21% and many authors consider that this pain is responsible for most cases of disability and leave of absence from work[2-4]. Disability in chronic low back pain patients varies between 11% and 76%[5-6] and this great variation is due to the disability concepts adopted as well as the different methods used to measure this phenomenon. This variation makes comparisons among studies difficult. In this research, pain-related disability refers to difficulties to perform activities of daily living at home or at work[7].

Literature has shown that factors unrelated to the disease itself can partially explain disability. Psychosocial and occupational factors like fear and difficulties in the work environment are considered possible determinants of disability. No consensus exists, however, on the main disability-related factors in CLBP patients[2,5,8]. Some authors consider pain intensity as the main factor, and others affirm that psychosocial factors are the most disabling[8-10]. Evidence exists that psychosocial factors can be more important than physiological aspects in the development of chronic pain and disability[8].

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Cognitive aspects have demonstrated to be of great importance in the chronic pain experience. Beliefs influence the pain experience: its appreciation, attribution of meaning to the experience and subsequent behaviors[7-10].

In view of the social importance of chronic low back pain, the resulting disability and gaps on the factors involved in this disability, especially the role of beliefs, the aim in this study was to identify the prevalence of disability in chronic low back pain patients and to verify the factors associated with disability in this patient group.

METHOD

Characteristics

Cross-sectional study of a non-probabilistic sample, including 177 patients with chronic low back pain – with a duration of more than six months. Data were collected at three health services in Sao Paulo State (two public and one private) between January and November 2008. Approval for the study was obtained from the Research Ethics Committee at the University of São Paulo School of Nursing (No. 684/2007/CEP-EEUSP).

Inclusion criteria: low back pain for at least six months, age between 18 and 65 years, at least six years of education and preserved comprehension and communication abilities.

Exclusion criteria: presence of cancer and acute health conditions that could alter the perception of pain-related disability.

The principal investigator applied the form and scales to 90% of participants. Two research aids (undergraduate nursing students) who had been trained to use the research instruments applied the remainder.

Study participants

During the data collection period, 292 patients complied with the inclusion criteria, 177 of whom agreed to participate in the study, with an acceptance rate of 60.6%. The main reason for refusal in 115 patients was lack of time to answer the research instruments (85.0%). No significant difference was found between patients who agreed and refused to participate in the study with regard to sex (p=0.75), age (p=0.47), education (p=0.05) and pain duration (p=0.05).

Data collection procedures, variables and instruments

Data were collected at a specialty outpatient clinic, at a center specialized in pain treatment and at an occupational health referral center. These health services attend to patients with varying complaints and diagnoses. Physicians at these services (neurologists, neurosurgeons or orthopedists) were informed of the study and its inclusion criteria. During data collection, patients with low back pain were forwarded for assessment by the researcher, who explained about the study objectives, assessed participants' eligibility and obtained their informed consent in case they accepted to participate.

In this research, as pain-related disability refers to difficulties to accomplish activities of daily live at home or at work[7], the disability outcome was defined with the Oswestry Disability Index (ODI) and the duration of the patient's absence from work because of the pain during the year before the study.

Individuals with a paid job were considered disabled if they scored $\geq$ 20 on the ODI and had been on leave at least 30 days the year before. For individuals without a paid job (on leave, unemployed, retired and housewives), only the ODI score $\geq$ 20 was used to indicate disability. The *independent variables* were: sex, age, marital status, education, family income, work situation, pain duration, pain

intensity, body mass index (BMI), depression, fatigue, self-efficacy and pain-related fear.

Participants answered the following research instruments:

• *Demographic identification form* – age, sex, marital status, education, work situation, family income, weight and height, besides pain characteristics.

• *Visual Numerical Pain Scale* - scale from 0 to 10, with 0 indicating no pain and 10 unbearable pain or the worst pain imaginable.

• *Oswestry Disability Index* (ODI), version 2.0 – assessed disability, is focused on the impact of pain on activities of daily living. The scale contains 10 items ranging from 0 to 5: the first assesses pain intensity, and the remainder the consequences of pain on daily living. The score ranges from 0 (absence of disability) to 100 (maximum disability)[11]. The validation of the scale in Portuguese showed very good internal consistency (Cronbach's alpha = 0.87) and excellent reliability based on the test-retest (0.99)[11]. In this study, reliability according to Cronbach's alpha equaled 0.89.

• *Beck Depression Inventory* (BDI)[12] - contains 21 items, with answers scored between 0 and 3 that reflect the intensity of depressive symptoms. The minimum score is 0 and the maximum 63. The cut-off points for populations without a previous depression diagnosis range between: 16–20 for dysphoria and ≥21 for depression[12]. The psychometric properties of the BDI in Portuguese were tested and its internal consistency according to Cronbach's alpha equaled 0.81[12]. In this study, the instrument's reliability, tested using Cronbach's alpha, corresponded to 0.92.

• *Revised Piper Fatigue Scale* (rPFS)[13] – this multidimensional and self-reported instrument consists of four domains (sensory, affective, cognitive-emotional and behavioral) and 22 items, scored between 0 and 10. The total score also varies from 0 to 10 and represents the mean item score. The Portuguese version showed good validity and reliability. Cronbach's alpha ranged between 0.84 and 0.94 and the test-retest corresponded to 0.60 (p <0.001)[13]. The reliability of the rPFS, tested in the present study sample with the help of Cronbach's alpha, equaled 0.94 for the total scale and between 0.83 and 0.92 for the domains. Four was adopted as the cut-off point, based on the 25th percentile. Patients scoring ≥ 4 were considered fatigued.

• *Chronic Pain Self efficacy Scale* (CPSS) – self-efficacy was assessed through the Portuguese version of the *Chronic Pain Self efficacy Scale* (CPSS). The scale was developed to measure the perceived self-efficacy and ability to cope with the consequences of pain in chronic pain patients[14]. The scale consists of 22 items and three domains, for which the respondents indicate their perception of the ability to perform specific activities or obtain results related to pain control, coping and functionality. The sum of the three domains represents the total scale score, which ranges between 30 and 300. The psychometric properties of the Portuguese version were tested and showed good validity and reliability rates (Cronbach's alpha ranged between 0.76 and 0.92 for the domains and equaled 0.94 for the total scale)[14]. In this study sample, Cronbach's alpha ranged between 0.87 and 0.89 for the domains and corresponded to 0.94 for the total scale. The original self-efficacy scale (CPSS) has no defined cut-off points. In the present study, a cut-off point was defined through the analysis of the ROC (Receiver Operator Characteristic) curve. The ROC curve area obtained for self-efficacy equaled 0.86, and the cut-off point was set at 185, sensitivity at 0.76 and specificity at 0.83. Self-efficacy scores <185 were considered low and ≥185 high.

• *Tampa Scale for Kinesiophobia* (TSK) – is one of the most used instruments to assess the fear of movement and pain avoidance[15]. The scale consists of 17 items and the score ranges between 17 and 68. The higher the score, the greater the fear and pain avoidance. The reliability of the Portuguese version was assessed using Rasch' analysis and revealed a reliability coefficient of 0.95, indicating excellent construct validity[15]. In this study, the reliability of the scale equaled 0.96 (Cronbach's alpha). The original TSK scale has no defined cut-off point. Here, the analysis of the ROC curve was used to define a cut-off point and resulted in an area of 0.80, with 42 as the cut-off point, 0.75 specificity and 0.75 sensitivity. Scores < 42 were considered low levels and scores ≥ 42 high levels of fear of movement and pain avoidance.

The decision to set cut-off points for scale that did not possess this was due to the desire to work with individuals with manifestations of fatigue and clinically relevant beliefs related to pain-related fear and self-efficacy.

Statistical analysis

Data were included in an SPSS (version 13) database and analyzed using STATA 9.0 software. The prevalence of disability and its respective confidence interval were calculated (95%). In this study, due to the high prevalence of observed disability (65.0%), the Prevalence Ratio (PR) and its respective confidence intervals (95% CI) were estimated for the sake of a univariate analysis of the relation between the independent variables and the disability outcome. Variables with p-value < 0.25 were selected for the multiple analysis. Cox' regression model with robust variance was used in this phase. The modeling process started with the variable that obtained the lowest p-value on the Wald test and, then, one by one, the remaining variables were added, with p-value < 0.25. Variables with p < 0.05 in the multiple analysis were maintained in the final model. Finally, the PR and their respective confidence intervals (95% CI) were estimated for each of these variables, with a descriptive level of 5%. Chi-square statistics were used to compare the proportions presented in the contingency tables.

RESULTS

Most study participants: were between 46 and 65 years of age (57.6%); female (72.3%); had a partner (67.8%); secondary education level (71,2%); monthly family income of up to U$1,350.00 (76.3%); overweight or obesity (63.3%); and referred intense pain (61.6%), which persisted for more than four years (63.3%). As regards work, most subjects (67.8%) had no paid job at the time of data collection (on leave, retired, unemployed and housewives) (Table 1).

In terms of depressive symptoms, 36.7% of participants obtained scores compatible with dysphoria or depression. Among the participants, 33.3% were fatigued. A predominance of patients with low self-efficacy (67.2%) and high levels of fear-avoidance beliefs were observed (61.0%), according to the adopted cut-off points in this study.

The mean disability score measured by the ODI was 33.2 (SD=13.3) and 80.7% of participants revealed scores compatible with moderate to severe disability. According to the criteria adopted to characterize disability (ODI score and duration of absence from work), 115 individuals were classified as disabled. Hence, the prevalence of disability corresponded to 65.0% (95% CI: 57.5 – 72.0).

Univariate analysis showed that patients with up to 11 years of education (p=0.015), patients without a paid job during the study period (p<0.001) and with a monthly family income of up to U$450.00 ($p$<0.004) showed higher disability prevalence ratios than the others (Table 2).

Table 1 – Sample characteristics - Sao Paulo, 2008

Characteristics	N	%	Mean (SD*)
Age			
18 – 45	75	42.4	46.9 (9.6)
46 – 65	102	57.6	
Gender			
Male	128	72.3	
Female	49	27.7	
Marital status			
Partner	120	67.8	
No partner	57	32.2	
Education (in years)			
6 – 11	126	71.2	11.0 (3.7)
≥ 12	51	28.8	
Employment situation			
Paid job	57	32.2	
No paid job	120	67.8	
Monthly family income (n = 164)			
≥ U$ 1.351,00	39	23.8	1.290.50
U$ 451,00 – U$ 1.350,00	77	47.0	(1.741.55)
U$ 450,00	48	29.3	
BMI			
Underweight/normal	65	36.7	27.2 (5.4)
Overweight/obesity	112	63.3	
Pain intensity			
Mild (1 – 4)	12	6.8	7.8 (2.0)
Moderate (5 – 7)	56	31.6	
Intense (8 – 10)	109	61.6	
Pain duration (months)			
6–18	23	13.0	97.8 (91.7)
19–48	42	23.7	
≥49	112	63.3	
Total	177	100	

* SD = standard deviation

Table 2 – Prevalence ratio of disability for sociodemographic variables - São Paulo, 2008

Variable[a]	Total	Disability No (prevalence)	Prevalence ratio (95% CI)	p-value
Age				
18 – 45	75	45 (60.0%)	1.00	
46 – 65	102	75 (73.5%)	1.14 (0.91 – 1.44)	0.247
Gender				
Male	49	33 (67.3%)	1.00	
Female	128	82 (64.1%)	0.95 (0.75 – 1.20)	0.677
Marital status				
Partner	120	73 (60.8%)	1.00	
No partner	57	42 (73.7%)	1.21 (0.98 – 1.50)	0.076
Education				
≥ 12 anos	51	25 (49.0%)	1.00	
6 – 11 anos	126	90 (71.4%)	1.46 (1.08 – 1.97)	**0.015**
Paid job				
Yes	57	16 (28.1%)	1.00	
No	120	99 (82.5%)	2.94 (1.92 – 4.49)	**<0.001**
Family income				
≥ U$ 1.351,00	39	16 (41.0%)	1.00	
U$ 450,00 – U$ 1.350,00	77	50 (64.9%)	1.58 (1.05 – 2.39)	**0.004**
<U$450,00	48	38 (79.2%)	1.93 (1.29 – 2.89)	

[a]N = 177 for all variables except income, for which N = 164.

Also, a higher disability prevalence ratio was observed among patients with intense pain (p<0.001), longer pain duration (p=0.034), depressive symptoms (p<0.001) and fatigue (p=0.001). Disability was more frequent too among individuals with low self-efficacy (p<0.001) and high levels of pain-related fear (p<0.001) (Table 3).

Table 3 – Prevalence ratio of disability for body mass index, pain characteristics, symptoms and beliefs - Sao Paulo, 2008

Variable[a]	Total	Disability (prevalence)	Prevalence Ratio (95% CI)	p-value
Body mass index				
Underweight/normal	65	36 (55.4%)	1.00	0.058
Overweight/obesity	112	79 (70.5%)	1.27(0.99 – 1.63)	
Pain intensity				
Mild/moderate	68	28 (41.2%)	1.00	**<0.001**
Intense	109	87 (79.8%)	1.94 (1.44 – 2.62)	
Pain duration				
6 - 18 meses	23	9 (39.1%)	1.00	**0.034**
>18 meses	154	106 (68.8%)	1.76 (1.0 – 2.97)	
Depression				
No symptoms	112	58 (51.8%)	1.00	**<0.001**
Depression	65	57 (87.7%)	1.69 (1.38 – 2.07)	
Fatigue				
No	118	66 (55.9%)	1.00	**<0.001**
Yes	59	49 (83.1%)	1.48 (1.22 – 1.81)	
Self-efficacy				
High	58	19 (32.8%)	1.00	**<0.001**
Low	119	96 (80.7%)	2.46 (1.68 – 3.60)	
Pain-related fear				
Low	69	29 (42.0%)	1.00	**<0.001**
High	108	86 (79.6%)	1.89 (1.41 – 2.54)	

[a]N = 177 for all variables.

Thus, the univariate analysis identified the following potential risk factors for disability in the study sample: education, employment situation, income, pain intensity, duration of pain, fatigue, depression, self-efficacy and pain-related fear.

To identify the variables that were independently associated with disability, Cox' multiple regression analysis was used. The multiple regression model, adjusted for pain-related fear and pain intensity, showed that disability was independently associated with low self-efficacy, depression and absence of paid work (Table 4).

Table 4 – Estimated prevalence ratios of disability according to Cox multiple regression model - São Paulo, 2008

Variables	RP_{br}	RP_{aj} (IC 95%)	valor de *p*
Self-efficacy			**0.002**
High	1.00	1.00	
Low	3.14	1.73 (1.23 – 2.44)	
Pain-related fear			0.055
Low	1.00	1.00	
High	1.92	1.27 (0.99 – 1.63)	
Depression			**0.022**
No symptoms	1.00	1.00	
Depression	2.30	1.22 (1.03 – 1.44)	
Paid job			**<0.001**
Yes	1.00	1.00	
No	4.39	2.45 (1.64 – 3.65)	
Pain intensity			0.071
Mild/moderate	1.00	1.00	
Intense	1.81	1.21 (0.98 – 1.50)	

[a]N = 177 for all variables; CPR: crude prevalence ratio; APR: adjusted prevalence ratio.

The chance of disability was 1.7 times higher among patients with low self-efficacy than among patients with high self-efficacy (p=0.002). Likewise, the chance of disability was 1.2 times higher among patient with depressive symptoms than among individuals without these symptoms (p=0.022). It was also observed that patients without a paid job revealed a 2.5 times higher chance of disability than patients who were employed (p<0.001).

DISCUSSION

The analysis of descriptive characteristics in the study sample showed the predominance of a low-income and low-education population, reflecting the Brazilian reality, even in the country's large metropolitan centers. Information from the Brazilian Institute of Geography and Statistics (IBGE)[(a)] showed that 64.3% of people in the productive age range in Brazil had less than 12 years of formal education in 2004, similar to the present study sample, in which 71.2% of patients had less than 12 years of education. Low income levels also predominated in this sample, as 76.3% of participants gained a monthly family income of up to U$1,350.00. As this study was accomplished at two Public Health Services and one Private Health Service, the predominance of patients with these characteristics was expected.

The prevalence ratio of disability observed in this research was high (65.0%), and higher than the reports of

[(a)]Available from: www.ibge.gov.br/ibgeteen/pesquisas/educacao.html

other authors who analyzed adults and elderly people with CLBP and observed prevalence ratios between 40% and 56%[2,16]. The variation found between the disability prevalence identified in this and other studies can be explained by the different definitions of disability. It should be highlighted, however, that the highly disabling potential of chronic low back pain was confirmed. Further research is due to evaluate whether disability prevention or reduction interventions can minimize this problem, improving these patients' functionality.

Pain-related disability affects different aspects of daily life and provokes mental suffering. Individuals who face difficulties to accomplish daily activities and are unable to keep up their professional activities tend to take distance from social contact and avoid leisure activities. Social isolation and avoidance of pain-related activities can reduce self-efficacy and increase the chance of developing depressive and disability symptoms.

Besides the emotional impact, the presence of disability overburdens the health system. Individuals who feel disabled by pain go through many consultations, examinations and surgeries, in search of answers and often without reaching the expected results. Disability-related social costs are also huge, considering that people disabled by pain present reduced productivity, absence from work and frequent leaves of absence, factors that put a significant strain on the social security system.

In this study, 80.7% of participants experience moderate to severe disability, a high level when compared to studies that evaluated disability in workers with musculoskeletal disorders and found 49% of workers with moderate to severe disability[17]. The high frequency of moderate to severe disability found can be explained by the fact that the sample exclusively comprised people with CLBP, a condition with a highly disabling potential. In addition, this sample consisted of people attended at health services, as opposed to the study that included active workers with different forms of low back pain[17].

The mean ODI score observed indicates moderate disability, similar to findings in a study of a population with CLBP[11].

Disability showed an association with many variables studied in the univariate analysis but, in the multiple analysis, only the variables self-efficacy, depression and employment situation remained as factors independently associated with disability (Table 4).

The chance of disability was 1.7 times higher among participants with low self-efficacy than among those with high self-efficacy. Low self-efficacy was also associated with disability in studies that assessed chronic pain patients[8,10,16,18]. The present study results confirm the importance of self-efficacy beliefs in the relation between pain and disability. A longitudinal study that investigated patients with CLBP concluded that improving self-efficacy beliefs mediated part of the relation between pain and disability over a 12-month period[18].

Disability is influenced by self-efficacy beliefs, as individuals with low levels do not get effectively involved in treatment, tend to have a more passive attitude and easily give up their objectives when obstacles are present. On the other hand, individuals with high self-efficacy adhere to treatment better, tend to be more persistent and, in general, maintain most of their activities, despite the pain. Identifying patients with low self-efficacy and intervening in the improvement of this belief can be an effective strategy to improve treatment results. Longitudinal intervention studies should test this hypothesis.

A greater trend towards disability was also observed among participants with more intense pain (p=0.055), although no statistically significant relation was revealed in the multiple analysis. The fact that pain intensity did not reveal to be a factor independently associated with disability reinforces the importance of psychosocial factors like beliefs and emotional factors in pain-related disability.

Pain-related fear showed an association with disability in different studies that assessed CLBP patients[19-20]. In the present research, however, fear showed to be associated with disability in the univariate analysis only, confirming other authors' findings that have shown self-efficacy as a more important factor than fear to explain disability in chronic pain patients[8,18].

Patients with depressive symptoms revealed a 1.2 times higher chance of disability than patients without these symptoms, which confirmed the findings by other authors that found an association between the presence of depressive symptoms, worse adjustment to pain and disability[10,20-21].

The relation between depression and disability can be explained by the fact that individuals who are unable to perform their activities because of pain feel disabled and powerless towards it. Besides, depressed patients tend to get more isolated and less motivated to involve in active treatment strategies. Negative thoughts and fatigue, frequent symptoms in depression, can also interfere in the form of coping with pain and contribute to the presence of disability. Therefore, treating depressive symptoms can be an effective strategy to minimize disability.

Finally, the chance of disability was 2.5 times higher among individuals without a paid job than among employees. Other studies that analyzed patients with acute and chronic low back pain also showed that people without a paid job have a greater chance of getting disabled[9,20].

The greater chance of disability among individuals without a paid job can be explained by the fact that, far from professional activities, individuals tend to focus more on pain, often feeling socially devalued. One possible suggestion to revert this situation would be to invest in physical rehabilitation programs for patients in chronic

pain, with a view to promoting reallocation in the job market. Performing physically feasible professional activities can help to recover these patients' self-esteem and improve their quality of life, besides the potential to reduce perceived disability.

This study offers important contributions to our reality as well as to the international context: the prevalence ratio of disability was determined in patients with chronic low back pain, based on strict and well-established criteria, which few studies have done. This research identified factors independently associated with disability in CLBP patients, suggesting that these factors should be taken into account in interventions aimed at preventing or reducing disability.

The identification of self-efficacy beliefs as associated with disability is a relevant finding. Beliefs are preconceived ideas, learned conceptions and, if dysfunctional (beliefs that are of no help in the person's recovery/adaptation), they can be relearned, as strategies exist to identify and re-signify beliefs proposed in the Cognitive-Behavioral Model, which nurses can learn and use[22].

Also, the contribution of this study should be highlighted, in that it very strictly established cut-off points for fatigue, self-efficacy and fear-avoidance beliefs, which did not exist. This decision contributed to include patients in the study who experienced the situation (fatigue, low self-efficacy and high pain-related fear) in a more enhanced way and contributed to clinical practice, as it allowed professionals to adopt a critical viewpoint, which should serve as an alert for patient care decisions.

The study has limitations. The cross-sectional design did not permit causal inferences and a convenience sample was used, which limits the generalizability of results. This research included patients from different health services, which can also be considered a limitation. Nevertheless, this strategy was used to include patients with different degrees of low back pain and disability. These limitations should be overcome in future studies.

CONCLUSION

These research results entail several clinical implications, in view of the high prevalence ratio and the fact that the factors identified to be independently associated with disability are modifiable. Specific interventions like work reallocation, modification of dysfunctional beliefs (low self-efficacy) and depression treatment can modify the identified factors. Further research is needed to verify whether interventions focused on these factors can reduce or prevent disability in chronic low back pain patients.

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Correspondence addressed to: Marina de Góes Salvetti
Rua Alfredo Salvetti, 43 – Apto. 24 – Centro
CEP 18130-525 - São Roque, SP, Brazil