*How to cite this article:* Ludwig AF, Hubner FP, Caovilla AR, Weizemann C, Barboza TV, Pereira KE et al. Comparison of disability between risk classifications for poor prognosis in chronic lombalgy: observational study. J Physiother Res. 2019;9(3):347-352. doi: 10.17267/2238-2704rpf.v9i3.2451

Original article

Journals BAHIANA
SCHOOL OF MEDICINE AND PUBLIC HEALTH

# Comparison of disability between risk classifications for poor prognosis in chronic lombalgy: observational study

# Comparação da incapacidade entre estratos de risco para mau prognóstico na lombalgia crônica: estudo observacional

**André Franco Ludwig[1], Fernanda Peron Hubner[2], Andrea Rafaela Caovilla[3], Carolina Weizemann[4], Taise Vieira Barboza[5], Katriane Endiel Pereira[6], Renata Anddresa Stachelski[7], Alberito Rodrigo de Carvalho[8]**

[1]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0002-8075-4034. afrancoludwig@gmail.com
[2]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0002-0800-4714. ferphubner@hotmail.com
[3]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0001-6492-1077. andrea_rcaovilla@hotmail.com
[4]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0003-0061-8479. carolweizemann@hotmail.com
[5]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0002-9567-8732. taise_vieirab@hotmail.com
[6]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0001-9377-3384. katriane.pereira@outlook.com
[7]State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0002-6516-0721. renataastachelski@gmail.com
[8]Corresponding author. State University of Western Paraná. Cascavel, Paraná, Brazil. ORCID: 0000-0002-5520-441X . alberitorodrigo@gmail.com

**RESUMO | INTRODUÇÃO:** A dor lombar crônica (DLC) é uma síndrome que compromete negativamente a capacidade funcional dos indivíduos. **OBJETIVO:** Verificar se há diferença no nível de incapacidade autor-relatado entre pacientes alocados nos diferentes estratos de risco para desenvolver mau prognóstico na DLC. **MATERIAIS E MÉTODOS:** Trata-se de um estudo piloto, observacional e transversal. A amostra foi composta por 17 voluntários com DLC, provenientes de um Centro de Reabilitação Física universitário local. Os voluntários foram solicitados a responder dois questionários, tanto para avaliação do nível de incapacidade quanto para determinar o risco de mau prognóstico. O nível de incapacidade autorrelatado foi determinado pela Versão Brasileira do Índice Funcional de Oswestry (IFO). O risco para desenvolver mau prognóstico foi determinado pelo questionário *STarT Back Screening Tool* (SBST), baseado na influência dos fatores psicossociais, e os voluntários foram classificados em baixo (n=6), médio (n=6) ou alto (n=5) risco de mau prognóstico. O teste estatístico utilizado foi o *Generalized Linear Model* (GLzM), com α=0,05. **RESULTADOS:** O grupo de baixo risco apresentou incapacidade mínima e os grupos com médio e alto risco apresentaram incapacidade severa, porém observou-se diferença estatística no IFO apenas entre os grupos de baixo e alto risco. **CONCLUSÃO:** Houve diferença na incapacidade autorrelatada entre os estratos de risco de mau prognóstico, sendo a incapacidade significativamente mais alta no grupo alto risco em comparação com o baixo risco, sugerindo que os aspectos psicossociais impactam não só para o prognóstico, mas também o nível de incapacidade de pacientes com dor lombar crônica.

**PALAVRAS-CHAVE:** Dor lombar. Dor. Prognóstico

**ABSTRACT | INTRODUCTION:** Chronic low back pain (CLBP) is a syndrome that compromises individual functional capacity negatively AIM: To verify whether there is a difference in the self-reported disability level among patients allocated into different risk strata to develop poor prognosis in CLBP. **MATERIALS AND METHODS:** This is a pilot, observational and cross-sectional study. The sample consisted of 17 volunteers with CLBP from a local University Physical Rehabilitation Center. Volunteers were asked to answer two questionnaires to assess both the level of disability and to determine the risk of poor prognosis. The level of disability was determined by the Brazilian Version of the Oswestry Functional Index (IFO). The risk for developing poor prognosis was determined by the STarT Back Screening Tool (SBST) questionnaire, based on the influence of psychosocial factors, and volunteers were classified as low (n=6), medium (n=6) or high (n=5) risk of poor prognosis. The statistical test used was the Generalized Linear Model (GLzM), with α=0.05. **RESULTS:** The low-risk group presented minimal disability and the medium and high-risk groups presented severe disability, but there was a statistical difference in IFO only between the low and high-risk groups. **CONCLUSION:** There was a difference in disability between risk strata of poor prognosis, with disability significantly higher in the high-risk group compared to low-risk, suggesting that psychosocial aspects impact not only on prognosis but also on the level of disability of patients with chronic low back pain.

**KEYWORDS:** Low back pain. Pain. Prognosis.

Submitted 07/11/2019, Accepted 08/12/2019, Published 08/20/2019
J. Physiother. Res., Salvador, 2019 August;9(3):347-352
Doi: 10.17267/2238-2704rpf.v9i3.2451 | ISSN: 2238-2704
Designated editor: Katia Sá

## Introduction

The chronic low back pain (CLBP) is a syndrome with high prevalence in the global population[1,2] and negatively compromises the individual functional capacity[3]. According to estimates, 80% of people will experience an episode of this type of pain at some point in their lives[4] and impairments in functional capacity are of both mechanical[5] and metabolic[4] orders.

This syndrome is currently one of the leading causes of disability in the global context[6]. Disability limits the functional level of patients with chronic low back pain[7] with a consequent decrease in functionality, which leads to malfunctions in the muscle characteristics of the lumbar multifidus muscles. These muscles are one of the strongest stabilizers of the lumbar spine[8] and their degeneration is common in patients with chronic low back pain, which causes a reduction in the strength generation capacity of this muscle group and, being one of the aspects that explain the impairment in the capacity stabilization of the spine and decrease in physical and functional capacity[9].

The functional limitation acquired by patients with CLBP causes disability and impaired quality of life[10,11]. In this sense, it is important to assess the level of disability in people with low back pain to characterize the natural history of the disease and to evaluate the effectiveness of treatment[7]. Disability is described as the result of the combination of changes in an individual's health condition with intrinsic and extrinsic factors that represent the circumstances in which the individual lives.

The Oswestry Questionnaire is a gold standard tool for assessing the disability of people with low back pain[12]. The Oswestry Functional Index (OFI) can measure self-reported disability in patients with CLBP, even with high severity and different etiologies. In addition, it aims to detect the degree of dysfunction of individuals with spinal disorders in activities of daily living and has a high degree of reliability demonstrated in previous research[13].

Additionally, a group of researchers developed another questionnaire[14], the STarT Back Screening Tool (SBST), later validated the Brazilian version[15], by which it is possible to quantify the impact of psychosocial factors, with or without physical-functional factors, on prognosis of the patient with CLBP, and identify if this patient has a high, medium or low risk to develop a poor prognosis of the disease.

Considering the biopsychosocial etiology of CLBP syndrome, which is often disregarded by one-dimensional approaches based only on physical or functional aspects[2], it is necessary to use assessment tools that take into consideration not only the physical but also the psychosocial aspects. Previous studies have shown that psychosocial factors such as the patient's perception of low back pain symptoms, the patient's relationship with other diseases, the difficulty in coping with the disease, the lack of self-confidence, catastrophizing and depressive symptoms have high interference in the prognosis of low back pain[16-18].

The SBST can be a very useful tool for this purpose, as the risk of poor prognosis increases in proportion to the increased contribution of psychosocial factors[15]. However, at least to the extent of the literature review conducted to prepare this research, no study has evaluated whether there are differences in the level of disability among patients with CLBP allocated to different risk strata of poor prognosis. Thus, the aim of the present study was to verify whether there is a difference in the level of self-reported disability among patients allocated to different risk strata to develop a poor prognosis in CLBP.

## Materials and Methods

This is a pilot, observational and cross-sectional study. The sample consisted of volunteers with a clinical diagnosis of chronic low back pain, coming from the Physical Rehabilitation Center of the University of Western Paraná, selected intentionally and not probabilistically, both genders and older than 18 years.

The study was approved by the Human Ethics Committee under protocol number 2625847 (CAAE 87241918.4.0000.0107). All volunteers were informed about the objectives and procedures of the study and signed the free participation consent form. The self-administered questionnaires were answered by the patients accompanied by an evaluator at the Laboratório de Pesquisa em Reabilitação Fisioterapêutica com Ênfase em Biodinâmica Integrativa (ReFEBI).

The level of disability was determined by the Brazilian Version of the Oswestry Functional Index, adapted from the original version 2.0. This instrument has a high degree of reliability (test-retest intraclass correlation coefficient [ICC] = 0.99 / internal consistency α = 0.87) (19). This is a questionnaire consisting of 10 questions, with six possible answers, in which the first has zero value and sequentially the last with five, being 50 the maximum score of the questionnaire. To turn the results into a percentage score, the examiner summed all the points, divided by 50 and multiplied the result by 100. Thus, the sample was classified as follows: 0% without disability; 1-20% minimum disability; 21-40% moderate disability; 41-60% severe disability; 61-80% unable and 81-100% exaggeration of symptoms.

The risk for developing a poor prognosis was determined by the STarT Back Screening Tool (SBST) questionnaire, which consists of nine items, the first four items (items 1 to 4) related to pain, dysfunction, and comorbidity; and the last five items (items 5 to 9) composing the psychosocial subscale. From the SBST results, patients were classified into low-risk groups (LR / total score between 0 and 3 points), medium risk (MR / total score greater than 3 and score less than or equal to 3 in the psychosocial subscale) and high risk (HR / total score greater than 3 and score greater than 3 on the psychosocial subscale).

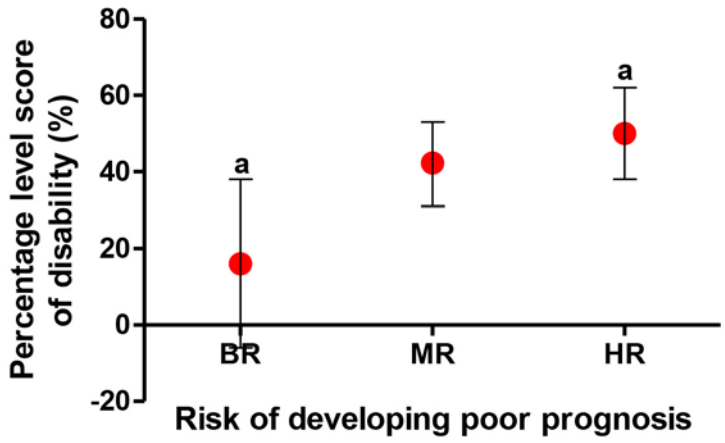
Statistical analysis was performed using the SPSS 20 software. The significance level adopted was 5% (α = 0.05). The statistical test used was the Generalized Linear Model (GLzM), which is based on maximum likelihood and uses the Wald Chi-Square Test to identify the effect of the variable on the generalized linear model.

## Results

The sample consisted of 17 volunteers with a mean age of 53.2 ± 12.0 years, body mass of 81.1 ± 23.5 kg, height of 1.62 ± 0.12 m, and distributed in the three strata of risk of poor prognosis: LR (n = 6), MR (n = 6) and HR (n = 5).

Differences in disability levels were observed between groups according to the risk rating for poor prognosis (Wald Chi-Square Test = 6.993; p = 0.030). The percentage values obtained by the OFI indicate that the low-risk group (LR) presented minimal disability (1-20%) and the medium-risk group (MR) and high-risk group (HR) presented severe disability (41-60%). The descriptive and inferential statistics for these variables are shown in Figure 1.

**Figure 1.** Descriptive statistics (mean and 95% confidence interval) for Oswestry Disability Index percentage scores and comparisons between groups according to the risk of developing poor prognosis, namely: low risk (LR), medium risk (MR) and high risk (HR)




Note: Equal letters indicate significant statistical differences.

## Discussion

The study assessed whether there are differences in the level of self-reported disability between the different risk strata of poor prognosis for CLBP proposed by the SBST. It was possible to identify that those individuals who were at high risk of developing a poor prognosis in low back pain were the same as those who were classified with a high percentage of disability level according to OFI.

Disability in patients with CLD is a multi-etiological phenomenon. The literature has shown that this phenomenon can be partially explained by factors unrelated to the disease itself[20]. According to previous research[21], psychosocial factors such as fear or the sensation of unreachable healing are considered possible determinants of disability.

Some authors[22] considered pain intensity as the main factor causing disability in patients with CLD. On the other hand, studies[23] state that psychosocial factors are the most disabling, providing evidence that these factors may be more important than physiological aspects in the development of chronic pain and disability.

A clinical trial targeting patient with chronic low back pain[24], assessed for disability by the Roland Disability Questionnaeir and psychosocial factors (Tampa Scale for Kinesiophobia; Beck Depression Inventory and Pain Catastrophizing Scale), noted the presence of psychosocial factors in all carriers with DLC, in addition to the various disabilities reported.

The SBST used in this study classified the sample into low, medium or high-risk groups to develop a poor prognosis in CLBP. This questionnaire allows us to quantify the impact of psychosocial factors, and the medium and high-risk groups are most affected by the presence of psychosocial factors since the risk of poor prognosis is higher as greater as the contribution of psychosocial factors. In this sense, it is possible to speculate that psychosocial aspects contribute not only to the worse prognosis in chronic low back pain but also affect the level of disability of patients with chronic low back pain.

In addition, previous research[18,25] suggests that pain has emotional and behavioral impacts that favor the development of chronic conditions and may be an obstacle in the patient's clinical course in rehabilitation. In this sense, a limitation of the present study was to assess the level of disability only through a self-reported tool and not to add objective tests that could functionally reflect the disability observed. Future research suggests investigating the relationships between functional capacity, self-reported disability level and risk of poor prognosis in chronic low back pain.

## Conclusion

It is concluded that there is a difference in disability according to risk strata of poor prognosis, with disability being significantly higher in the high-risk group compared to low risk. It is suggested with this conclusion that psychosocial aspects impact not only the prognosis but also the disability level of patients with chronic low back pain.

### Author contributions

Ludwig AF participated in the study design, literature review, research data collection and writing of the scientific article. Weizemann C, Pereira KE, Stachelski RA, Barboza TV participated in the data collection. Caovilla, AR participated in the data collection and writing of the scientific article. Hubner FP participated in the literature review, data collection and writing of the scientific article. Carvalho AR participated in the conception, statistical analysis of data and interpretation of the results and writing of the scientific article.

### Competing interests

No financial, legal or political competing interests with third parties (government, commercial, private foundation, etc.) were disclosed for any aspect of the submitted work (including but not limited to grants, data monitoring board, study design, manuscript preparation, statistical analysis, etc.).

## References

1. Chou R, Qaseem A, Snow V, Casey D, Cross TJ, Shekelle P et al. Diagnosis and treatment of low back pain: a joint clinical practice guideline from the American College of Physicians and the American Pain Society. Ann Intern Med. 2007;147(7):478-91. doi: 10.7326/0003-4819-147-7-200710020-00006

2. O'Sullivan P. Diagnosis and classification of chronic low back pain disorders: maladaptive movement and motor control impairments as underlying mechanism. Man Ther. 2005;10(4):242-55. doi: 10.1016/j.math.2005.07.001

3. Carvalho AR, Andrade A, Peyré-Tartaruga LA. Possible changes in energy-minimizer mechanisms of locomotion due to chronic low back pain - a literature review. Rev Bras Reumatol (English Ed. 2015;55(1):55-61. doi: 10.1016/j.rbr.2014.01.013

4. Carvalho AR, Ribeiro Bertor WR, Briani RV, Zanini GM, Silva LI, Andrade A, et al. Effect of nonspecific chronic low back pain on walking economy: an observational study. J Mot Behav. 2016;48(3):218-26. doi: 10.1080/00222895.2015.1079162

5. Lamoth CJC, Meijer OG, Daffertshofer A, Wuisman PIJM, Beek PJ. Effects of chronic low back pain on trunk coordination and back muscle activity during walking: changes in motor control. Eur Spine J. 2006;15(1):23-40. doi: 10.1007/s00586-004-0825-y

6. Burden G, Study D, Burden G, Study RF, Metrics H, Unterst M, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013. The Lancet 2015 p. 743-800. doi: 10.1016/S0140-6736(15)60692-4

7. Horng YS, Hwang YH, Wu HC, Liang HW, Mhe YJ, Twu FC, et al. Predicting health-related quality of life in patients with low back pain. Spine (Phila Pa 1976). 2005;30(5):551-5. doi: 10.1097/01.brs.0000154623.20778.f0

8. Kim SH, Park KN, Kwon OY. Pain intensity and abdominal muscle activation during walking in patients with low back pain. Med (United States). 2017;96(42):e8250. doi: 10.1097/MD.0000000000008250

9. Bertor WRR, Fracaro GA, Silva LI, Zílio M, Aragão FA, Carvalho AR. Subclassificação da lombalgia crônica e nível de incapacidade: efeito no desempenho funcional e força muscular. Conscientiae Saúde. 2013;12(4):563-71. doi:10.5585/ConsSaude.v12n4.4514

10. Bento AAC, Paiva ACS, Siqueira FB. Correlação entre incapacidade, dor - Roland Morris, e capacidade funcional - SF-36 em indivíduos com dor lombar crônica não específica. E-scientia. 2009;2(1):1-18.

11. Stefane T, Munari AS, Marinovic A, Hortense P. Dor lombar crônica: intensidade de dor, incapacidade e qualidade de vida. Acta Paul Enferm. 2013;26(1):14-20. doi: 10.1590/S0103-21002013000100004

12. Carvalho AR, Gregório FC, Engel GS. Descrição de uma intervenção cinesioterapêutica combinada sobre a capacidade funcional e o nível de incapacidade em portadoras de lombalgia inespecífica crônica. Arq Ciências da Saúde da UNIPAR. 2009;13(2):97-103. doi: 10.25110/arqsaude.v13i2.2009.3011

13. Vigatto R, Alexandre NMC, Correa Filho HR. Development of a Brazilian Portuguese version of the Oswestry Disability Index: cross-cultural adaptation, reliability, and validity. Spine (Phila Pa 1976). 2007;32(4):481-6. doi: 10.1097/01.brs.0000255075.11496.47

14. Hill JC, Dunn KM, Lewis M, Mullis R, Main CJ, Foster NE, et al. A primary care back pain screening tool: Identifying patient subgroups for initial treatment. Arthritis Care Res. 2008;59(5):632-41. doi: 10.1002/art.23563

15. Pilz B, Vasconcelos RA, Marcondes FB, Lodovichi SS, Mello W, Grossi DB. The Brazilian version of STarT Back Screening Tool - translation, cross-cultural adaptation and reliability. Brazilian J Phys Ther. 2014 Oct;18(5):453-61. doi: 10.1590/bjpt-rbf.2014.0028

16. Airaksinen O, Brox JI, Cedraschi C, Hildebrandt J, Klaber-Moffett J, Kovacs F, et al. Chapter 4: European guidelines for the management of chronic nonspecific low back pain. In: European Spine Journal. 2006. p. 192-300. doi: 10.1007/s00586-006-1072-1

17. Pincus T, Burton AK, Vogel S, Field AP. A systematic review of psychological factors as predictors of chronicity/disability in prospective cohorts of low back pain. Spine (Phila Pa 1976). 2002;27(5):E109-20. doi: 10.1097/00007632-200203010-00017

18. Nicholas MK. Depression in people with pain: there is still work to do commentary on 'understanding the link between depression and pain.' Scand J Pain. 2011;2(2):45-6. doi: 10.1016/j.sjpain.2011.02.003

19. Roland M, Fairbank J. The Roland-Morris Disability Questionnaire and the Oswestry Disability Questionnaire. Spine (Phila Pa 1976). 2000;25(24):3115-24. doi: 10.1097/00007632-200012150-00006

20. Sardá J, Nicholas MK, Asghari A, Pimenta CAM. The contribution of self-efficacy and depression to disability and work status in chronic pain patients: A comparison between Australian and Brazilian samples. Eur J Pain. 2009;13(2):189-95. doi: 10.1016/j.ejpain.2008.03.008

21. Wynne-Jones G, Dunn KM, Main CJ. The impact of low back pain on work: A study in primary care consulters. Eur J Pain. 2008;12(2):180-8. doi: 10.1016/j.ejpain.2007.04.006

22. Woby SR, Urmston M, Watson PJ. Self-efficacy mediates the relation between pain-related fear and outcome in chronic low back pain patients. Eur J Pain. 2007;11(7):711-8. doi: 10.1016/j.ejpain.2006.10.009

23. Swinkels-Meewisse IEJ, Roelofs J, Oostendorp RAB, Verbeek ALM, Vlaeyen JWS. Acute low back pain: Pain-related fear and pain catastrophizing influence physical performance and perceived disability. Pain. 2006;120(1-2):36-43. doi: 10.1016/j.pain.2005.10.005

24. Smeets RJ, van Geel KD, Verbunt JA. Is the fear avoidance model associated with the reduced level of aerobic fitness in patients with chronic low back pain? Arch Phys Med Rehabil. 2009;90(1):109-17. doi: 10.1016/j.apmr.2008.07.009

25. Linton SJ, Shaw WS. Impact of psychological factors in the experience of pain. Phys Ther. 2011;91(5):700-11. doi: 10.2522/ptj.20100330