

ORIGINAL ARTICLE

FUNCTIONAL DISABILITY AND PAIN INTENSITY IN NON-SPECIFIC CHRONIC LOW BACK PAIN IN NURSING WORKERS*

Zulamar Aguiar Cargnin¹, Dulcinéia Ghizoni Schneider², Mara Ambrosina de Oliveira Vargas³, Ione Jayce Ceola Schneider⁴

ABSTRACT

Objective: To determine pain intensity and functional disability in patients with non-specific chronic low back pain.

Method: Cross-sectional study with 90 nursing workers of a public hospital conducted between August and October 2017. The Roland Morris Questionnaire and Visual Numerical Scale were used. Bivariate analyzes, Pearson or Spearman correlations and Anova test for comparison of means were performed.

Result: Pain intensity was moderate and associated with Body Mass Index and limitation in activities of daily living and reduction of work productivity. Functional disability was low and related to having more than one nursing job and aged 41- 50 years.

Conclusion: Low back pain intensity and functional disability were associated with work and individual factors. The identification of these factors may favor the implementation of preventive measures and guide more accurate and specific rehabilitation interventions. The relationship between the intensity of pain and disability was significant, positive and moderate.

DESCRIPTORS: Low Back Pain: Nursing; Pain measurement; Worker's health: Occupational Diseases.

*Article extracted from the master's dissertation "Nursing Work Process and its influence on non-specific low back pain". Universidade Federal de Santa Catarina, 2018.


HOW TO REFERENCE THIS ARTICLE:


Cargnin ZA, Schneider DG, Vargas MA de O, Schneider IJC. Functional disability and pain intensity in non-specific chronic low back pain in nursing workers. *Cogitare enferm.* [Internet]. 2019 [access "insert day, month and year"]; 24. Available at: <http://dx.doi.org/10.5380/ce.v24i0.65058>.




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¹Nurse and Physiotherapist. Nursing Doctoral Student. Universidade Federal de Santa Catarina. Florianópolis, SC, Brazil. 

²Nurse. PhD, Nursing. Nursing Professor at Universidade Federal de Santa Catarina. Florianópolis, SC, Brazil. 

³Nurse. PhD, Nursing. Nursing Professor at Universidade Federal de Santa Catarina. Florianópolis, SC, Brazil. 

⁴Physiotherapist. PhD, Collective Health. Professor at Universidade Federal de Santa Catarina. Araranguá, SC, Brazil. 

INCAPACIDADE FUNCIONAL E INTENSIDADE DA DOR NA LOMBALGIA CRÔNICA INESPECÍFICA EM TRABALHADORES DE ENFERMAGEM

RESUMO

Objetivo: determinar a intensidade da dor e a incapacidade funcional em portadores de dor lombar crônica inespecífica.

Método: estudo transversal com 90 trabalhadores da enfermagem de um hospital público entre agosto e outubro de 2017. Empregou-se Questionário de Roland Morris e Escala Visual Numérica. Procederam-se análises bivariadas, correlações de Pearson ou Spearman e teste Anova para comparação de médias.

Resultado: a intensidade da dor foi moderada e associada com Índice de Massa Corpórea e limitação em atividades de vida diária e trabalho. A incapacidade funcional mostrou-se baixa e relacionada ao duplo emprego na enfermagem e faixa etária de 41 a 50 anos. A relação entre intensidade da dor e incapacidade foi significativa, positiva e moderada.

Conclusão: a intensidade da dor lombar e incapacidade funcional associaram-se a fatores laborais e individuais. A identificação desses fatores pode favorecer a implementação de medidas preventivas e guiar intervenções reabilitativas mais elaboradas e específicas.

DESCRITORES: Dor Lombar; Enfermagem; Medição da Dor; Saúde do Trabalhador; Doenças Profissionais.

INCAPACIDAD FUNCIONAL E INTENSIDAD DEL DOR LUMBAR CRÓNICA INESPECÍFICA EN TRABAJADORES DE ENFERMERÍA

RESUMEN

Objetivo: determinar la intensidad del dolor y la incapacidad funcional en portadores de dolor lumbar crónica inespecífica.

Método: estudio trasversal con 90 trabajadores de enfermería de un hospital público, hecho entre agosto y octubre de 2017. Se utilizó cuestionario de Roland Morris y Escala Visual Numérica. Se hicieron análisis bivariados, correlaciones de Pearson o Spearman y test Anova para comparación de promedios.

Resultado: la intensidad del dolor fue moderada y se la asoció al Índice de Masa Corpórea y limitación en actividades de vida diaria y trabajo. La incapacidad funcional se reveló baja y relacionada a la doble jornada en la enfermería, además de franja etaria de 41 a 50 años. La relación entre intensidad del dolor e incapacidad fue significativa, positiva y moderada.

Conclusión: la intensidad del dolor lumbar así como la incapacidad funcional se asociaron a factores laborales e individuales. La identificación de esos factores puede favorecer la implementación de medidas preventivas y orientar intervenciones de rehabilitación más apropiadas y específicas.

DESCRIPTORES: Dolor Lumbar; Enfermería; Medición del Dolor; Salud del Trabajador; Enfermedades Profesionales.

INTRODUCTION

Low Back Pain (LBP) is localized below the lower margin of the twelfth rib and above the gluteal fold, and painful symptoms may extend to lower limbs⁽¹⁾. The condition involves multiple causes and is considered chronic if it persists for more than three months⁽¹⁻²⁾. Chronic low back pain causes functional disability, reduces quality of life, leads to absenteeism, early retirement and the cost of its treatment is high⁽³⁻⁴⁾. Therefore, studies on LBP-related disability are important. In the workplace, this condition leads to turnover, temporary or permanent leave, with social and financial impacts on workers at their full productivity potential⁽⁵⁾.

Low back pain may originate from various spinal structures, but the specific etiology of this condition cannot be determined in 85% of cases. Low back pain may originate from an injury or stresses on different spinal structures, but the specific pathological etiology cannot be determined in 85% of the cases, being characterized as nonspecific and attributed to mechanical and postural causes^(1,6-7).

Patients usually recover quickly from episodes of LBP, but recurrence may occur. In some cases, low back pain leads to functional disability and pain persistence aggravated by factors such as high pain intensity and psychological impairment. The costs of the treatment, the use of health services and the types of disabilities caused by low back pain vary across the countries, influenced by local culture, social systems, and health beliefs. The incidence of low back pain is expected to increase mainly in low and middle-income countries that have fragile health systems, which do not support this burden. Extensive research should be conducted and several initiatives should be undertaken around the world to address this issue⁽⁶⁾.

Studies conducted in 2013 within the scope of the Global Burden of Disease Study (GBD) research program have identified low back pain as the leading cause of functional disability for several years. Low back pain was considered one of the ten most common health problems in all countries. The increased occurrence of this condition was attributed to population aging, which leads to a substantial increase in the number of individuals with sequelae of diseases and injuries⁽⁸⁾. Low back pain affects individuals in low, middle and upper income nations and in all age groups⁽⁶⁾.

Nursing is an occupation with a high risk for LBP⁽⁹⁻¹⁰⁾. Pain causes suffering, social isolation, limitation of work activities, functional impairments and physiological and psychological consequences that impact the quality of life of nursing professionals. It requires proper management through its assessment and measurement and the recognition of associated factors^(3,11). Therefore, assessment of pain intensity and its related disability may provide more in-depth knowledge about the chronic low back pain (cLBP) experienced by the individuals, to provide guidance on the treatment and its evolution⁽¹¹⁾. In this regard, it facilitates clinical management of LBP and secondary prevention in the workplace⁽⁷⁾. In view of the aforementioned, the present study aimed to determine pain intensity and functional disability in individuals with non-specific chronic LBP.

METHOD

Cross-sectional study conducted in a public hospital in Florianópolis, Santa Catarina, with nurse assistants, nurse technicians and nurses. The sample consisted of 90 workers. Data was collected from August to October 2017. Nursing workers from all areas of the hospital were selected to participate in the study. Selection was based on information contained in the work schedules of the professionals.

Inclusion criteria were professionals who were experiencing low back pain for more than twelve weeks; with intensity of at least two points on the Visual Numeric Scale (VNS),

with monthly frequency of 2 or more times⁽¹²⁾, and who performed exclusively nursing duties. The participants should also answer the following question: "How long have you been experiencing low back pain and is there a medical diagnosis for your condition?"

For the selection of the participants, the painful symptom was associated with site, duration (lasting longer than three months), monthly frequency and absence of specific pain etiology. Exclusion criteria were nursing professionals with low back pain related to specific causes such as disc herniation, spinal stenosis, spinal infections, spinal tumors, fractures, among others.

Data was collected with the use of a form containing sociodemographic questions (gender, age, Body Mass Index, marital status), work-related questions (occupation, shift, overtime, other employment contracts, length of time in the nursing job in the health institution, desire to change their careers) and directly related to LBP (frequency, duration, limitation to perform Activities of Daily Living (ADL) and self-reported relationship between pain and work), Roland Morris Questionnaire (RM) and VNS.

The Roland Morris Questionnaire measures functional disability caused by low back pain to perform activities of daily living (ADL) and provides guidance for pain management. The RM is a standard questionnaire that was developed to assess the limitations of individuals with LBP consisting of 24 questions (Yes/No) related to daily activities, pain and function. The higher the score, the greater the disability of the individual with LBP. The cutoff score is 14, i.e. scores higher than 14 indicate poorer performance. The RM questionnaire was translated and adapted to Portuguese⁽¹³⁾ and has high test-retest and inter-rater reliability.

The VNS measured the worst pain intensity over the last three months using a 10-point scale ranging from 0 (no pain) to 10 (worst pain). Scores 2-9 indicate intermediate levels of pain, as follows: mild pain (scores 1- 2), moderate pain (scores 3-7) and severe pain (scores 8-10)⁽¹⁴⁾. Pain was also classified as non-significant <5 and significant ≥ 5 . Pain that led to higher levels of functional disability was considered significant⁽³⁾.

Descriptive analysis was used to identify the absolute and relative frequency of categorical and mean variables and standard deviation (SD) of continuous variables; bivariate analyzes using Chi-square (χ^2) or Fisher's exact tests were performed to verify the association between exposure and outcome (pain intensity and functional disability).

Also, Anova test was used to compare means, and Pearson or Spearman coefficients were used to verify correlations between the variable pain intensity and functional disability, as follows: weak correlation (<0.4), good/ moderate correlation (0.4 0.75) and strong correlation (≥ 0.75)⁽¹⁵⁾. A p value less than 0.05 was considered significant. Data was arranged in Excel spreadsheets, and Statistical Package for Social Sciences (SPSS), version 23, was used for the statistical analysis.

The study was approved by the Human Research Ethics Committee under Protocol No. 2.081.192/2017.

RESULTS

The sample of 90 nursing workers with non-specific chronic low back pain included nurse assistants, nurse technicians and nurses. According to Table 1, the participants were in average 42 years old (SD 9.15), minimum of 24 years old and maximum of 62 years old. The mean Body Mass Index (BMI) was 27.6 kg/m² (SD 5.6), minimum of 19.05 kg/m² and maximum of 46.71 kg/m².

Table 1 – Distribution of sociodemographic and work-related characteristics of nursing workers with low back pain. Florianópolis, SC, Brazil, 2017 (continues)

Sociodemographic and work-related variables (n=90)	n	%
Gender		
Male	16	17.8
Female	74	82.2
Marital status		
Single	24	26.7
Married/living with a companion	56	62.2
Separated/divorced	9	10
Widowed	1	1.1
Age range		
30 years or older	9	10
31 years or older	31	34.5
41 to 50 years	29	32.2
51 or older	21	23.3
Body Mass Index (BMI)		
Normal	34	37.8
Overweight	29	32.2
Obesity	27	30
Occupation		
Nurse Assistant/ Nurse Technician	78	86.7
Nurse	12	13.3
Length of time in the nursing job in the health institution		
Up to 4 years	28	33.3
More than 4 to 8 years	13	15.5
More than 8 to 14 years	19	22.6
More than 14 years	24	28.6
Shift		
Day	57	63.3
Night	33	36.7
Overtime in the health institution		
Yes	67	74.4
No	23	25.6
Another employment contract		
Yes	29	32.2
No	61	67.8
Working hours		
6 hours	10	11.1
8 hours	3	3.3
12 hours	77	85.6

Desire to change the career		
Yes	20	23.8
No	64	76.2

Regarding the self-reported characteristics of nursing workers with chronic LBP, 53 (58.9%) reported limitation of Activities of Daily living (ADL) and reduced work productivity due to pain and 87 (96.7%) related the pain symptom to the performance of their work activities. They showed an average pain frequency of 11.07 during the month ($SD \pm 9.44$) times, with 55 (61.1%) 3 to 8 times in the month, 21 (23.3%) 10 to 20 times and 14 (15.5%) 25 to 30 times during the month and said that pain episodes occurred sometimes on a daily basis, with a minimum of 3 and a maximum of 30 episodes of pain in the month.

The average duration of pain (in years) was 5.43 ($SD \pm 4.21$) years, with a minimum of six months and a maximum of 20 years of pain; fifty-six workers (62.1%) were experiencing low back pain from 6 months to 5 years; 29 (32.2%) from 6 to 10 years, and five participants (5.5%), from 11 to 20 years.

The average intensity of low back pain reported by nursing professionals and the pain intensity level distributed in a given occupational group were 6.27 ($SD \pm 1.79$) with 2.2% (mild pain), 76.7% (moderate pain) and 21.1% (severe pain). There was a small difference in the average pain intensity between men 5.94 ($SD \pm 1.52$) and women 6.34 ($SD \pm 1.85$), and the results were considered moderate. Regarding the occupation, 6.35 Nurse Technicians/ Assistants ($SD \pm 1.80$) and Nurses 5.75 ($SD \pm 1.76$) also experienced pain of moderate intensity.

All participants with serious functional disability reported intense pain (≥ 5). The Roland Morris questionnaire results showed no significant functional disability i.e., pain does not seem to significantly impair their Activities of Daily Living. Only six (6.7%) participants scored more than 14 points in the Roland Morris questionnaire. The mean positive answers of the RM questionnaire was 7.52 ($SD \pm 4.32$).

Pain intensity was positively associated with BMI ($p = 0.030$) and the highest prevalence was in overweight patients with chronic low back pain; and with self-reported limitation in ADL and lower work productivity due to pain ($p = 0.006$) (Table 2).

Table 2 - Association between significant pain intensity in nursing workers of a public hospital in southern Brazil. Florianópolis, SC, Brazil, 2017

Variables	n	Pain intensity* (n/%)	P value [†]
BMI [‡]			0.030
Normal	90	23 (67.6)	
Overweight		27 (93.1)	
Obesity		23 (85.2)	
Limitation in ADL [§]			0.012
No	90	25 (67.6)	
Yes		48 (90.6)	

*Pain intensity: Visual Numeric Scale (VNS) ≥ 5 , [†]p-value: significance level <0.05 , [‡]BMI: Body Mass Index [§]AVD; Activities of Daily Living

Functional disability showed a statistically significant association with having another nursing job ($p = 0.041$) (Table 3). Comparison of the level of functional disability assessed by the RM questionnaire with age group showed that functional disability prevailed in the subjects aged 41-50 years (Table 4).

Table 3 - Association between the RM* questionnaire and having another job among workers of a public hospital in Southern Brazil (n=90). Florianópolis, SC, Brazil, 2017

Another job	RM*(≤ 14)	RM*(> 14)	p-value [†]
	No	Yes	
No	64 (76.2)	02 (33.3)	0.041
Yes	20 (23.8)	04 (66.7)	

*RM: Roland Morris Questionnaire. †P-value: significance level $p < 0.05$

Table 4 - Comparison using Anova test of the RM* Questionnaire with age range in nursing workers of a public hospital in southern Brazil. (n=90). Florianópolis, SC, Brazil, 2017

	Less than 30 years Mean (SD) [‡]	31-40 years Mean (SD) [‡]	41-50 years Mean(DP) [‡]	51 years or older Mean (SD) [‡]	p-value [†]
RM*	5.00 (3.12)	6.19 (3.58)	8.90 (4.73)	8.67 (4.36)	0.013*

*RM: Roland Morris Questionnaire, †p-value: significance level $p < 0.05$, ‡SD: Standard Deviation

Individual analysis of each one of the factors of the RM questionnaire showed that the most prevalent factors were "I change position often trying to make my back comfortable," "I avoid heavy work at home because of my back," "I avoid bending down or kneeling "," because of my back, I climb stairs more slowly than usual ".

Pain duration showed a strong significant positive correlation with pain frequency ($r = 0.984$ and $p = 0.002$). There was a statistically significant positive and moderate correlation between pain intensity and the functional disability construct ($\rho = 0.609$ and $p < 0.001$).

DISCUSSION

LBP is a major problem worldwide. The present study attempted to relate pain intensity and LBP-related functional disability.

The measurement of pain intensity through the VNS showed moderate values. However, pain is a complex process associated with psychosocial and cultural factors, involving subjective aspects⁽¹⁾. Pain causes biological, emotional, cognitive and behavioral disorders⁽¹⁶⁾. Its clinical and rehabilitation management to improve long-term outcomes must consider social and cultural factors⁽¹⁾.

Pain intensity was related to self-reported limitation of activities of daily living (at least during one day) and overweight. One study also showed a more prevalent association between functional disability and BMI in obese (38.6%), overweight individuals (23.9%)

and middle-aged individuals. Overweight leads to lower postural stability, shorter range of motion and balance disorders. It may be a risk factor because the excess abdominal adiposity may cause individuals to adopt compensatory positions, but consensus over the consequences of overweight has not yet been reached⁽¹⁷⁾.

The limitation of self-reported ADLs may indicate that patients with LBP avoid pain-causing activities, which generates a vicious circle of pain, immobilization and pain. This fact contributes to the chronicity of pain⁽¹⁸⁾. Reduced physical activity affects the musculoskeletal system, reducing the mass, strength and endurance of spinal muscles. It also affects physical capacity and overall fitness⁽¹⁹⁾. The constant avoidance and fear of movement - kinesiophobia, depressive symptoms and pain intensity contribute to non-recovery from symptoms⁽²⁰⁾.

The functional disability measured by the RMI questionnaire was low in this sample. In the results, the mean score of 7.52 (\pm 4.32) was lower than the cutoff point, but the scores differed from 0 to 20 and show some variability in the sample. Non-specific chronic LBP does not seem to significantly impair ADL and work performance in this population of nursing workers.

A study with workers of a manufacturing company also found low functional capacity deficit levels in functional disability, in which low back pain does not fully limit but impacts physical, emotional and social aspects. Apparently, LBP rarely causes total disability, but may partially or temporarily limit certain activities of daily living and be recurrent⁽²¹⁾. Still, temporary functional disability causes worker turnover, whether due to career changes, reduced workload, or temporary or permanent removal from occupational activities. This fact generates relevant social costs and workers at their full productivity potential leave the workforce prematurely⁽⁵⁾.

On the other hand, some studies obtained different results. In a study with individuals who suffered specific and non-specific low back pain, a mean score of 14.4 points was obtained, which characterizes severe disability mainly associated with the physical domain (pain, discomfort, fatigue, sleep, rest)⁽¹¹⁾. However, functional disability can be more significant in individuals with a specific diagnosis. Another study reported high levels of pain, disability and depression, but the relationship between these variables was weak and may point to other contributing factors. However, the correlation between disability and depression was moderate and positive, suggesting that the greater the disability, the greater the possibility of depression or vice versa⁽²⁾.

In another study, disability was 65% (moderate to severe) in 80.7% of patients, which represents a high potential for functional limitation of chronic low back pain. Another study reported a percentage of functional disability of 65% (moderate to severe) in 80.7% of patients, which represents a high potential for functional limitation caused by chronic low back pain. The authors associated functional disability with absence from work, low self-efficacy and depression⁽³⁾. It should be noted that the concepts and methods used to measure the degree of disability differed among the studies, making comparison difficult.

Studies addressing psychosocial and psychological factors in LBP and LBP-related functional impairments suggest a biopsychosocial and multicausal approach. Pain implies a change in physical and mental health⁽¹⁸⁾, even if there is no consensus on the specific contribution of each component. Patients with LBP and depression were 1.2 times more likely to have functional disability^(3,21).

Psychosocial aspects have more significant consequences on pain management and treatment and have more impact on functional disability than pain intensity itself⁽¹⁶⁾. Interventions conducted by professionals when treating disabling LBP should consider these conditions in the workplace context⁽²²⁾.

Functional disability showed a statistically significant association with having another nursing job and being aged 41-50 years. LBP is more frequent in productive individuals aged 40 years or older. In addition to the physical discomfort caused by pain, it has social

consequences such as absenteeism and higher social security costs⁽¹⁶⁾.

The fact that the individual has another nursing job brings to light the overtime hours, which impacts the workers' physical health, with greater risk exposure. The likelihood of pain increases by 35% for each additional hour of work⁽²³⁾. No consensus was reached about the maximum number of overtime hours nursing professionals can work without compromising their health status⁽²⁴⁾.

There were no significant differences in the scores between the genders and among the professional categories. Pain intensity was also associated with several items of the RM questionnaire to detect disability. Some actions described in the RM questionnaire revealed greater functional disability: "I change position often trying to make my back comfortable", "I avoid heavy work at home because of my back," "I avoid bending down or kneeling", "I lie down to rest more often because of my back". Another study⁽⁴⁾ also reported these restrictive actions associated to more severe functional impairments.

Pain duration was correlated to the frequency of pain during the month. Pain intensity and functional disability showed a good and positive correlation indicating that pain intensity is a moderate predictor of functional disability. Another study with individuals with LBP identified high levels of pain, disability and depression. However, correlation between pain intensity and disability and between pain intensity and depression was positive and weak, and between disability and depression was moderately positive. The average pain intensity was 7.38 points, slightly higher than in the present study, but also of moderate intensity⁽²⁾.

Finally, despite the association with psychosocial and physical factors, there are still gaps in the studies that assess low back pain and related functional disability⁽²⁵⁾. Pain intensity can help guide treatment selection, but the severity of pain alone does not indicate that the patient has a severe condition. It comprises other factors such as the suffering caused, work status, psychosocial status and physical capacity. Functional disability related to LBP is even more complex, with physical, psychological and social repercussions, and requires more accurate interventions⁽²⁶⁾.

The present study provided more detailed information about LBP and contributed to the understanding of the current scenario of the nursing field, by addressing aspects of pain intensity and disability level. Both factors can be modified and prevented.

The cross-sectional design of the study, in which cause and effect are simultaneously assessed, and the fact that it was performed in only one health institution, compromising its external validity, are some limitations of this study. Some risk factors for LBP, such as psychological, cognitive and emotional factors (e.g. fear-avoidance beliefs that may lead to greater disability) were not included. Instruments that explore these associations could be used in further studies. The results obtained should be cautiously interpreted, and studies with larger and more representative samples are suggested.

CONCLUSION

Although nursing professionals have been experiencing pain for a long time, their functional disability was low. However, this does not imply that pain does not affect the quality of life of these workers in work-related, physical, as well as emotional and social aspects. Pain intensity was moderate and had a significant positive association with functional disability. However, pain intensity alone cannot be related to functional disability. Other aspects, such as psychosocial and psychological factors, may be associated with LBP and LBP-related chronicity and functional disability.

In the nursing scenario, knowledge of aspects related to chronic low back pain, pain intensity and functional disability may favor the implementation of preventive measures or even mitigate its negative effects and guide more effective rehabilitation interventions.

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Received: 20/02/2019

Finalized: 28/08/2019

Corresponding author:

Zulamar Aguiar Cargnin

Universidade Federal de Santa Catarina

R. Agostinho Sielski, 263 - 88035-320 - Florianópolis, SC, Brasil

E-mail: zulamar.aguiar@gmail.com

Role of Authors:

Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work - ZAC, DGS, MAOV, IJCS

Drafting the work or revising it critically for important intellectual content - ZAC, DGS, MAOV, IJCS

Final approval of the version to be published - DGS

Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved - ZAC, DGS
