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JOÃO PEDRO ESTEVES BRAGADA

Impact of Non-Specific Chronic Low Back Pain in Participation

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Trabalho realizado sob a orientação de:

Prof. Dr. João José Carreiro Páscoa Pinheiro

Dr. Joana Maria dos Reis Mata Albuquerque Martins

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2. Abstract

Chronic low back pain [CLBP] affects a large number of people from different ages and has very diverse implications on patients' quality of life. The **Objective** of this study was to assess the impact of CLBP with: the activity profile and participation related to mobility; and with the degree of incapacity in performing daily tasks. **Methods:** The sample consisted of 40 patients with CLBP, 26 women and 14 men. The mean age was 52 years, standard deviation of 13 and the minimum and maximum ages were 18 and 70 years old, respectively. The inclusion criteria were: CLPB as the main complaint that persisted for more than 12 months, age between 18 and 70 years old, the absence pathologies that impair movement, such as neurological, traumatic or muscle-skeletal; and ability to read and write in Portuguese. The Roland Morris Disability Questionnaire was used to measure the degree of disability and the Activity Profile and Participation related to Mobility questionnaire were the basis of this study. Nonparametric statistics were used to analyze and to associate the results. The **Results** showed an absence of the effect of age and gender on the intensity of low back pain; and revealed a significant correlation between Pain Level, Disability, and Participation. **Conclusion:** this study suggests that Pain Level and Disability are positively correlated with Participation; Age and Gender do not influence the results.

Keywords: CLBP - Chronic low back pain; Mobility; Participation; PAPM - Profile of activity and participation related to mobility; RMDQ - Roland Morris Disability Questionnaire.

3. Introduction

Chronic Low back pain is defined as low back pain persisting for longer than 12 weeks, or after the period of healing or recurring back pain that intermittently affects an individual over a long period of time [1]. It is defined as pain and discomfort below the costal margin and above the inferior gluteal folds, with or without referred leg pain [2].

Chronic Low Back Pain [CLBP] commonly follows a recurrent course, with exacerbations occurring over time. Low back pain affects children to elderly, but peaks between ages of 35 and 55. The prevalence is slightly higher in men (mean: 10.1%; 95% CI 9.4 to 10.7) compared to women (mean: 8.7%; 95% CI 8.2 to 9.3) [3]. The lifetime prevalence of non-specific (common) low back pain is estimated at 60–70% in industrialized countries [1].

The etiology of this condition is very complex and not fully understood. Previous studies demonstrate that low back pain is influenced by psychological, somatic, occupational and postural factors. Nonspecific low back pain refers to all the possible causes of the CLBP and through this whole paper when referring to CLBP, we are referring to nonspecific low back pain.

The psychological role is of enormous importance, as factors such stress, anxiety, depression, negative affectivity, low levels of social support in work place and work dissatisfaction tend to contribute to the development of low back pain [1, 4, 5]. Not only they can be part of the cause, but these factors can also present after. Psychological distress such as anxiety and depression were more prevalent in CLBP patients compared to patients without CLBP [6]. Patients with this condition showed significant impairment of psychological status [7].

Body height and weight are also considered risk factors [1]. Body mass index is a modifiable risk indicator for CLBP [8]. In addition, Age also plays a significant role because the prevalence of this pathology is higher in older than in younger adults [9].

Professionals who are exposed to vibrations, or long standing positions are more prone to CLBP [1]. Considering that head-neck and trunk postures are changeable, correcting the working posture of healthcare professionals gains importance [10]. Work-related ergonomic showed a significant association with CLBP in bus drivers [11]. Repetitive work involving bent positions and the manual manipulation of heavy objects increases the risk of future chronic low-back pain [12].

In a previous study regarding low back pain and the loss of the social role, participants often reported a negative self-perception in social interactions, with shame and frustration regarding their difficulties to perform activities of daily living. Beyond pain and disability, psychological and social aspects have a significant impact on living with CLBP [13].

Therefore, we can refer to CLBP as a biopsychosocial condition that can have major setbacks in one's quality of life.

Despite being a chronic disease, it can be relieved with the use of a wide range of pharmaceutical agents (including NSAIDs, tricyclic antidepressants, analgesics and anticonvulsants), supplemented by appropriate non-pharmacological measures such as exercise programs, manual therapies and behavioral therapies [14, 15]. There is a lot of research being done regarding this topic. Some exercises such as Pilates and Yoga showed significant improvement in pain relief and functional enhancement [16, 17].

The leading model of disability, International Classification of Functioning, Disability and Health (ICF) [18], puts every person in a context. Functioning and disability, these are the result of the interaction between health conditions and environmental factors. Functioning is an umbrella term for body functions and body structures, activities and participation. It denotes the positive aspects of the interaction between an individual (with a health condition) and the individual's contextual factors (environmental and personal factors). On the other hand, ICF describes disability as an umbrella term for problems at

any of the levels of the body (impairment), individual (activity limitation) or individual in society (participation restriction) [19].

The involvement of the individual in a real-life situation is considered participation, a key component of function. Example of this component are complex and socially collaborative situations, such as interacting with others and joining community activities [18].

Although, there are many articles about CLBP, few could be found relating CLBP and its impact on participation in the Portuguese population.

4. Objectives

The present study aims to evaluate the impact for chronic low back pain in complex daily life situations.

Specifically, this study tries to answer the following questions:

- Is CLBP associated to age and gender; What's the relation between CLBP and the level of incapacity, and the profile of activity and participation related to mobility?

Based on the above questions, we formulated the following guiding **hypotheses**:

- (i) Gender and / or age are not determinant factors for: (i) CLBP levels (Pain Level), (ii) activity profile and participation related to mobility (Participation), (iii) nor the degree of disability (Disability).
- (ii) Pain Level correlates with Disability and with Participation.
- (iii) Disability and Participation correlate with each other.

5. Methods

a) *Sample and study design*

The sample consisted of 40 patients with CLBP, 26 women and 14 men. Table 1 shows the characteristics of the sample.

Table 1. Characteristics of the sample: Mean age, standard deviation (StD), maximum and minimum.

	n	Mean Age (years)	StD	Minimum	Maximum.
Men	14	56.36	9.54	40	70
Women	26	50,23	14,01	18	70
Total	40	52.38	12,4	18	70

Inclusion criteria were: low back pain as the main complaint that persists for more than 12 months, age between 18 and 70 years and ability to read and write in Portuguese. Exclusion criteria were neurological, orthopedic, rheumatic, traumatic or other pathologies that impair mobility, serious comorbidities (metastases, cerebral vascular accidents), psychopathology (clinically defined mental retardation, dementia or other mental illness), pregnant or previously pregnant 3 months before.

The questionnaires were filled voluntarily, during a specialty consultation in PRM Department of CHUC and PRM Department of Diocesan Caritas of Coimbra. Every single one of the patients filled the informed consent, authorizing the use of the data. The Ethics Committee of the University of Coimbra and Caritas gave the positive opinion to carry out the study. (Parecer CE -111/2017).

b) Evaluation procedures

In order to determine the pain level of each person, Visual Analog Scale (Attachment 1) was used. This procedure uses a 10cm ruler. One end means no pain and the other end means very severe disabling pain. The patient places a mark on the ruler at the point he judges to reflect his level of pain. The investigator measures in cm the distance from the mark to the origin and records this value (from zero to ten). The patient marks on the ruler the point he deems appropriate for his case. This scale was developed and validated by Price et al. [20].

To analyze the profile of activity and participation related to mobility, a questionnaire was elaborated and validated for the Portuguese population by Martins [21] which consists of a set of 18 questions, which the patient graduated according to the difficulty experienced in each of the activities mentioned (Attachment 2). The graduation was made in accordance with the following scale: zero - no difficulty (no difficulty); 1 - slight difficulty (little difficulty); 2 - moderate difficulty (some difficulty); 3 - severe difficulty (severe difficulty); and 4 - complete difficulty (unable to perform). The answer was not answered when an activity was not applicable.

The degree of disability resulting from low back pain, in daily life activities, was achieved through the Roland-Morris questionnaire [22] adapted and validated for the Portuguese population by Gil et al. [23] (Attachment 3). This questionnaire consists in a set of 24 daily life situations, then the patient answers if they apply to him or not. The classification varies between zero choices and the choice of all situations (twenty-four).

c) Statistical procedures

The data evaluation and statistical study was performed with the SPSS 23 program for Windows. To examine the normal distribution, we used the Kolmogorov-Smirnov and Shapiro-Wilk distribution tests. In all variables we calculated the mean, standard deviation, maximum and minimum values.

The nonparametric Mann Whitney test was used to compare quantitative data by gender (independent variables). The effect of age on the remaining variables was made using Kruskal-Wallis non-parametric test.

To calculate the correlation between the variables we used the nonparametric test rho (ρ) of Spearman. To express the strength of the correlation we used the classification proposed by Hinkle et al [24], in which a correlation between zero and 0.3 is considered negligible; between 0.3 and 0.5 is considered weak; between 0.5 and 0.7 is considered moderate; between 0.7 and 0.9 is considered high; and between 0.9 and 1 is considered to be very high.

In all tests, significance was considered at $p < 0.05$ levels.

6. Results

In order to determine what type of tests would be appropriate to apply in the analysis of the results, the normality of all variables was verified. Tables 2 and 3 show the results of these tests. The Kolmogorov Smirnov test was used for the whole sample ($n > 30$) and the Shapiro Wilk test was used to test the subgroup normality (by gender), since the samples were less than 30. As we can see, the sample does not follow a normal distribution in the variables Pain Level and Participation ($p < 0.005$).

Table 2. Results of the Kolmogorov Smirnov normality test, applied to the whole sample. (gl - Degrees of freedom; Sig - Statistical significance)

Variable	Statistic	gl	Sig.
Pain Level	0,146	40	0,032
Participation	0,144	40	0,035
Disability	0,116	40	0,191
Age	0,117	40	0,184

The results of Table 3 show that, the variable Age specifically the feminine gender and Participation in both genders did not follow a normal distribution ($p < 0.05$).

Thus, the subsequent analysis and correlation of the variables was done with non-parametric statistics.

Table 3. Results of the Shapiro Wilk normality test, applied to the different variables, according to gender. (gl - Degrees of freedom; Sig - Statistical significance)

Variable	Gender	Statistic	gl	Sig.
Age	0 – Fem	0,917	26	0,038
	1 - Masc	0,946	14	0,497
Pain Level	0 – Fem	0,956	26	0,318
	1 - Masc	0,924	14	0,249
Disability	0 – Fem	0,929	26	0,074
	1 - Masc	0,929	14	0,293
Participation	0 – Fem	0,921	26	0,046
	1 - Masc	0,921	14	0,001

Table 4 shows the results obtained in different variables organized by gender. The mean values of the female gender are superior, which means that women tend to report higher impact of Pain Level, Disability and Participation. The Gender effect is not statistically significant, as evidenced by the Man-Whitney test, in two cases, Disability and Pain Level ($p > 0.05$). This means that the results obtained for these two variables are gender independent. On the other hand, regarding Participation the effect of the gender is present and significant ($p < 0.05$), the mean and maximum values of the masculine gender are inferior compared to the feminine gender.

Table 4. Descriptive values for different variables, according to gender. It also presents the effect of gender.

Variable	Gender	Mean	Standard Deviation	Minimum	Maximum	Gender's effect (a)	p
Pain Level	0 –Female (n=26)	5,31	2,13	1	9		
Pain Level	1 –Male (n=14)	4,21	1,89	1	7	Absent	0,111
Disability	0 –Female (n=26)	11,46	4,8	4	19		
Disability	1 –Male (n=14)	10,57	5,53	3	23	Absent	0,528
Participation	0 –Female (n=26)	0,75	0,6	0	2,5		
Participation	1 –Male (n=14)	0,41	0,54	0	1,75	Present	0,033

(a) – Non-parametric test - Mann-Whitney, for independent samples

Table 5 presents the results of the three variables considering the entire sample. The mean value of Pain Level is 4.93 (49% on a scale of zero to ten). The mean value of Disability is 11.5 out of 24 (48% of the maximum). The mean value of Participation is 0.63 the maximum is 4 (16%).

Table 5 also shows the values of the non-parametric test - Kruskal-Wallis, which evaluates the effect of age on the other variables. In this context, there is no effect of Age ($p > 0.05$), which means that Pain Level, Disability and Participation are independent of Age. This shows that the three variables are Age independent.

Table 5. Descriptive values for the different variables, in the whole sample. It also shows the effect of Age.

Variable	n	Mean	Standard Deviation	Minimum	Maximum	Age's effect (a)	p
Pain Level	40	4,93	2,09	1	9	Absent	0,422
Disability	40	11,15	5,02	3	23	Absent	0,593
Participation	40	0,63	0,60	0	2,5	Absent	0,241

(a) – Non-parametric test - Kruskal-Wallis, for independent samples

The following table (table 6) shows the correlation values between the different variables and their degree of significance. There is a fairly high positive correlation ($\rho = 0.59$) between Pain Level and Participation; a slightly lower correlation between Participation and Disability ($\rho = 0.56$); and a moderate correlation between the Pain Level and Disability ($\rho = 0.34$). These three variables are statistically correlated between each other.

Variable	n	Spearman Test	Participation	Disability
Pain Level	40	Correlation coefficient / correlation strength	0,59 / moderate	0,34 / weak
		Bilateral significance	$\rho = 0,000$	$\rho = 0,034$
Participation	40	Correlation coefficient / correlation strength		0,56 / moderate
		Bilateral significance		$\rho = 0,000$

7. Discussion

One of the main objectives of this study was to determine the effect of Gender and Age on the other three variables studied - Pain Level, Disability and Participation. This correlation is not statistically significant. Age is usually a factor associated with the severity of many diseases, including low back pain. Older people tend to have experienced a longer period of injuring activities. More years of work based on physical activity and the posture over several hours can potentiate the severity of the pain and, consequently, increase Disability and deteriorate Participation. Regarding the absence of the gender effect, most professions and activities are common to both genders. The number of labors may have implications on the onset of low back pain. However, the number of children / labors has declined and complete recovery may occur.

The results obtained in the studied variables reveal a great dispersion of values, as shown by the values of the standard deviations. This may mean that the impact of pain, and its consequences, is felt quite differently from one person to another. Regarding the magnitude of the results, we highlight that the mean value of Participation is 16% of the maximum possible by the questionnaire used. This value is inferior than the other two mean variables' values (Pain Level - 49%; Disability - 48%). Despite referring intermediate mean values of Pain Level and Disability, the mean value of Participation is relatively low.

Another objective of the study was to relate Pain Level, Participation and Disability with each other. While not being able to consider Pain Level as the sole cause of the results obtained in Participation and Disability, it is fair to consider that it is a major cause. There is positive and significant correlation between Pain Level and Participation and Disability, which may mean that Pain Level impacts Participation and Disability. From the qualitative point of view, considering the classification proposed by Hinkle et al. [24], there is a moderate correlation between Pain Level versus Participation ($\rho = 0.59$), as well as Participation versus Disability ($\rho = 0.56$). On the other hand, there is a weak correlation between Pain Level and Disability. This may mean that patients try to minimize the effect of pain by using coping strategies.

Although our study is limited to specifically associate certain factors, it is common to associate CLBP with other variables. Thus, according to other studies CLBP is associated with diminished social interaction, with repercussions on the reduction of social relations at home and at work [1]. Another study reported that depression, anxiety, and stress associated with CLBP contribute to reduced hours of work, wage and break in interpersonal relationships [2], as well as its implication in the reduction of quality of life [5]. In some cases, CLBP may imply a decrease in social identity such as a perception that it is not possible to adequately perform the social role at work and at home [13].

a) Limitations / recommendations of our study

One of the limitations of our study is that the sample is relatively small. Thus, caution is needed when generalizing the results to the population.

Considering the characteristics of our sample, it was not possible to form subgroups with their own characteristics, such as: years of coexistence with pain; use or not of medication; profession; cognitive level; number of labors; or other factors usually associated with low back pain.

In order to overcome these limitations, it would be appropriate to draw up a larger study, considering more factors, involving more groups of researchers and some institutions. Consequently, it would be possible to understand the depth of low back pain implications' in the Portuguese population.

8. Conclusion

Considering the first hypothesis, we can conclude that in this study, Gender is not correlated with Pain Level, nor with Disability. In contrast, we can conclude that only the female gender is positively correlated with Participation. Also, Age does not have a significant effect on any of the other variables.

About the second hypothesis, we can conclude that Pain Level is positively correlated with Participation and Disability. The most evident correlation is between Pain Level and Participation.

Regarding the third hypothesis, Participation and Disability correlate positively.

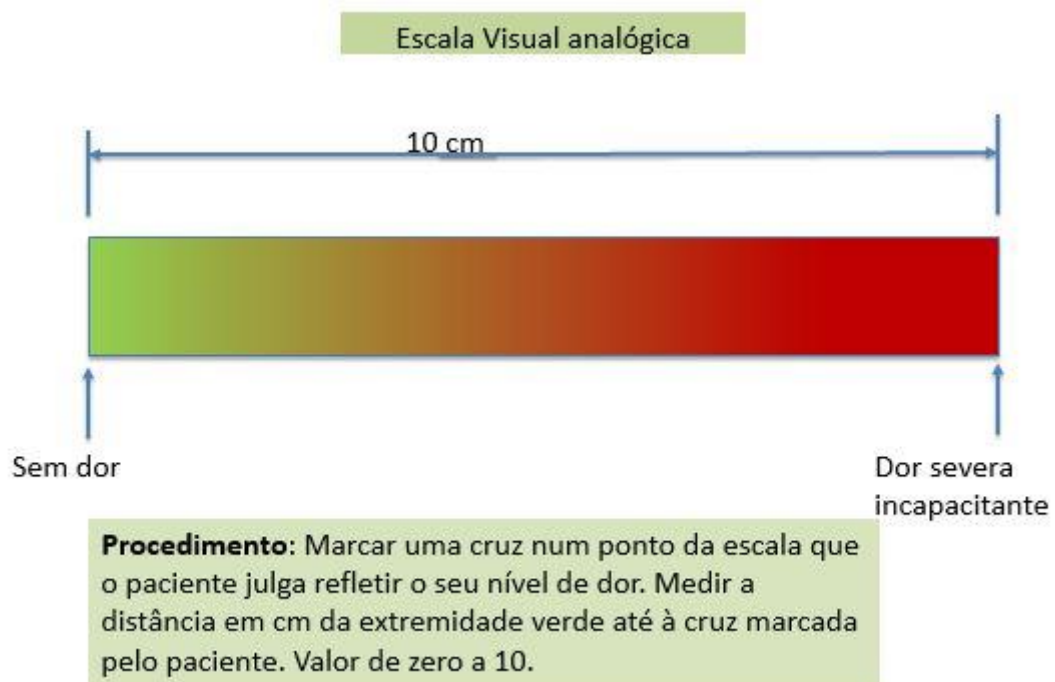
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10. Attachments

a) Attachment 1 – Visual analogue scale



b) Attachment 2 – Questionário - Perfil de atividade e participação relacionada com a mobilidade (PAPM)

Perfil de atividade e participação relacionada com a mobilidade

- 0 Sem dificuldade - nenhuma dificuldade
- 1 Dificuldade ligeira - pouca dificuldade
- 2 Dificuldade moderada - alguma dificuldade
- 3 Dificuldade severa - bastante dificuldade
- 4 Dificuldade completa - incapaz de realizar
- NA Não se aplica

	Gradue a dificuldade que sente relativamente a cada uma das atividades que se seguem	0	1	2	3	4	NA
1	Tomar conta das atividades domésticas dentro de casa						
2	Verificar diariamente a caixa do correio ou despejar o lixo						
3	Visitar familiares ou amigos, sempre que desejar						
4	Receber pessoas em sua casa sempre que desejar						
5	Relacionar-se com os seus vizinhos e com a comunidade local, em geral						
6	Zelar pela própria saúde (inclui a toma de medicamentos, ir a consultas, etc)						
7	Tomar conta de outras pessoas (crianças, idosos ou pessoas dependentes)						
8	Tomar conta de plantas ou animais (se os tiver ou gostasse de ter)						
9	Ir à escola, formação ou outra instituição de formação						
10	Manter um emprego remunerado						
11	Gerir as finanças domésticas (fazer compras, pagamentos, etc)						
12	Conduzir ou usar transportes públicos para se deslocar onde desejar						
13	Ir ao café, restaurante, a cerimónias, reuniões, etc						
14	Fazer férias - passar alguns dias fora						
15	Praticar desporto ou exercício físico (como marcha, ciclismo, natação, etc)						
16	Ir ao cinema, teatro, concertos, exposições, etc.						
17	Ir à igreja regularmente ou sempre que desejar						
18	Participar em atividades de voluntariado						

Martins A.C. Development and initial validation of the activities and participation profile related to mobility (APPM). BMC Health Services Research 2016;16:78-79.s (2016)

QUESTIONÁRIO DE INCAPACIDADE DE ROLAND MORRIS – RMDQ

Gil JN, Cabri J, Ferreira PL. Efectividade dos cuidados de fisioterapia em doentes ambulatoriais com problemas lombares não específicos. Revista Portuguesa de Saúde Pública 2009 Vol Temático(8):35-50.

Quando tem dores nas costas, pode sentir dificuldade em fazer algumas das coisas que normalmente faz. Esta lista contém frases que as pessoas costumam usar para se descreverem quando têm dores nas costas. Quando as ler, pode notar que algumas se destacam porque o descrevem hoje. Ao ler a lista, pense em si hoje. Quando ler uma frase que o descreve hoje, **coloque-lhe uma cruz**. Se a frase não o descrever, deixe o espaço em branco e avance para a frase seguinte. Lembre-se, apenas coloque a cruz na frase se estiver certo de que o descreve hoje.

1	Fico em casa a maior parte do tempo por causa das minhas costas.	
2	Mudo de posição frequentemente para tentar que as minhas costas fiquem confortáveis	
3	Ando mais devagar do que o habitual por causa das minhas costas.	
4	Por causa das minhas costas não estou a fazer nenhum dos trabalhos que habitualmente faço em casa	
5	Por causa das minhas costas, uso o corrimão para subir escadas.	
6	Por causa das minhas costas, deito-me com mais frequência para descansar.	
7	Por causa das minhas costas, tenho de me apoiar em alguma coisa para me levantar de uma poltrona.	
8	Por causa das minhas costas, tento conseguir que outras pessoas façam as coisas por mim.	
9	Visto-me mais lentamente do que o habitual por causa das minhas costas.	
10	Eu só fico em pé por curtos períodos de tempo por causa das minhas costas.	
11	Por causa das minhas costas, evito dobrar-me ou ajoelhar-me.	
12	Acho difícil levantar-me de uma cadeira por causa das minhas costas.	
13	As minhas costas estão quase sempre a doer.	
14	Tenho dificuldade em virar-me na cama por causa das minhas costas.	
15	Não tenho muito apetite por causa das dores das minhas costas.	
16	Tenho dificuldade em calçar peúgas ou meias altas por causa das dores das minhas costas.	
17	Só consigo andar distâncias curtas por causa das minhas costas.	
18	Não durmo tão bem por causa das minhas costas.	
19	Por causa da dor nas minhas costa, visto-me com a ajuda de outras pessoas.	
20	Fico sentado a maior parte do dia por causa das minhas costas.	
21	Evito trabalhos pesados em casa por causa das minhas costas.	
22	Por causa das dores nas minhas costas, fico mais irritado e mal-humorado com as pessoas do que o habitual.	
23	Por causa das minhas costas, subo as escadas mais devagar do que o habitual.	
24	Fico na cama a maior parte do tempo por causa das minhas costas.	