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Cross-Sectional Study

How Does Self-Efficacy Influence Pain Perception, Postural Stability and Range of Motion in Individuals with Chronic Low Back Pain?

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Background: Low back pain (LBP) is the most prevalent musculoskeletal problem among adults. Individuals with chronic LBP (CLBP) can present a psychological disorder and a lack of pain self-efficacy.

Objectives: The objective of this study was to compare the process of repetition-induced summation of activity-related pain, the lumbar range of motion, and the postural stability of patients with non-specific LBP (NSLBP) based on their level of self-efficacy.

Study Design: This research used a descriptive, cross-sectional study design.

Methods: This research included 60 patients with NSCLBP. Patients were classified as having "high" or "low" self-efficacy based on a median split of scores on the Chronic Pain Self-Efficacy Scale. All patients received a sociodemographic questionnaire, a psychological self-reported measures (Tampa scale of Kinesiophobia; Pain Catastrophizing Scale; Rumination subscale, Magnification subscale; Helplessness subscale; Roland-Morris Disability Questionnaire; Fear-Avoidance Belief Questionnaire; Physical Activity subscale; Work subscale); and completed the Temporal Summation Lifting Task, Lumbar Range of Motion, and Multi-Directional Functional Reach Test (MDFRT).

Results: The results indicated that the low self-efficacy group had a shorter lumbar range of motion and lower postural stability, in addition to greater pain intensity in the temporal summation lifting task, compared with the high self-efficacy group. The analysis showed that the strongest correlation for the high self-efficacy was between fear of movement and the temporal summation lifting task, and greater scores at the psychological questionnaires, compared with the high self-efficacy group ($r = 0.711$; $P < 0.01$). The strongest correlations found for the low self-efficacy group, showed a positive relationship between pain catastrophizing and the temporal summation lifting task ($r = 0.765$; $P < 0.01$), and a strong negative association between pain catastrophizing for the magnification subscale and lumbar range of motion ($r = -0.759$; $P < 0.01$).

Limitations: The results of this study should be interpreted with caution because of its cross-sectional design, and therefore causal relationships cannot be established. A significant limitation of the study is that patients' physical activity levels were not assessed, which could have influenced their ability to perform motor tasks at the perceived difficulty and fear level.

Conclusions: The high self-efficacy group had less pain in the temporal summation lifting task, a greater range of motion, and a greater functional range, in addition to a lower influence of psychological factors.

Key words: Low back pain, chronic pain, self-efficacy, temporal summation, range of motion, postural stability, fear of movement, pain catastrophizing, low back disability

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Low back pain (LBP) is defined by patients as pain located between the lower margins of the rib cage and the upper limits of the gluteal muscles. LBP can be short-lived or long-lasting (1).

LBP is the most prevalent musculoskeletal problem and has a considerable socioeconomic impact. It is one of the most common causes of work absenteeism and disability, interfering with basic daily activities related to the social and occupational lives of those who experience the disorder (2–4) .

Chronification of LBP leads to a change in brain representation of pain, having greater importance the cognitive and emotional brain areas (5). Studies have shown that patients with chronic LBP (CLBP) can present with central sensitization processes that result in maladaptive neuroplastic changes; these changes are worsened by the influence of psychosocial variables such as a lack of self-efficacy (5,6).

The term self-efficacy was defined by Bandura in 1977 after numerous studies that analyzed phobic behaviors. The author concluded that all changes in behavior depend on the individual's sense of ability and their motivation to make this change. The concept of self-efficacy is therefore defined as a psychological state in which the individual judges their ability to perform an action or behavior in the most effective manner, considering the circumstances and the perceived difficulty level (7). Human behavior depends on the interaction of personal, environmental, and behavioral influences, so that cognition and outcome expectations play a large role in the ability to develop an action in the most effective manner (7). This variable is considered a very important psychological factor since it is the engine for obtaining psychosocial well-being and developing motivation to achieve success (7).

Self-efficacy refers to the ability to perform an action or behavior in the most effective manner. Studies have shown that self-efficacy depends on 2 variables: (1) the expectations of efficacy or the conviction that one can successfully perform the necessary behavior to obtain results; and (2) the expectations of results or the estimate by the individual that a specific behavior will lead to the expected results (7,8).

Considering the above, studies have shown that patients with chronic pain can have difficulty performing their daily life activities, thereby showing a lack of self-efficacy (9,10). Moreover, studies have observed that beliefs in one's ability to manage pain, and specifically, the expectation of results and of efficacy are predictors of health behaviors in individuals with chronic pain (11,12).

It is also worth noting that a lack of self-efficacy in patients with chronic pain has been correlated with other types of somatosensory, affective, and cognitive variables. There is evidence that patients with chronic pain who have high levels of self-efficacy also present a lower intensity of pain and disability associated with their problem (13,14). In 2011, Costa et al conducted a study on individuals with CLBP and observed (after performing a regression analysis) that, when faced with pain, beliefs of self-efficacy are a more important factor than fear of movement in predicting disability and pain intensity (15).

Based on the available literature, the main objective of this study was to compare: the process of repetition-induced summation of activity-related pain, the range of motion in lumbar flexion, and the postural stability of two groups of patients with nonspecific CLBP (NSCLBP) depending on the self-efficacy level. The secondary objective was to analyze whether there are relationships between the physical variables described above and psychological and disability variables.

Methods

Study Design

A cross-sectional study with a nonprobabilistic sample was conducted to assess the temporal summation lifting task, lumbar spine range of motion, and psychological variables of patients with NSCLBP. The study was conducted in accordance with the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statement (16). The study followed the principles of the Declaration of Helsinki and was approved by the La Salle University Ethics Committee (CSEULS-PI-126/2016). Written informed consent was obtained from all patients.

Patients

The consecutive nonprobabilistic convenience sample consisted of 60 patients with NSCLBP. Patients were classified as having "high" or "low" self-efficacy based on a median score split on the Chronic Pain Self-Efficacy Scale. Group 1 consisted of 30 patients who registered a low level of self-efficacy, and group 2 was composed of 30 patients who registered a high level of self-efficacy.

The sample was recruited from the La Salle University campus and the local community through flyers, posters, and social media; and from outpatients of a primary health care center in Alcobendas, Madrid, Spain.

Inclusion Criteria

Patients were selected if they met all the following inclusion criteria: (a) low back pain during at least the past 6 months; (b) low back pain of a nonspecific nature; (c) not having undergone back surgery; (d) not having specific spinal disease (e.g., malignancy, inflammatory joint and bone diseases); and (e) 18 to 65 years of age. In addition, patients were asked not to take medication 24-48 hours before the evaluation.

Exclusion Criteria

Patients were excluded if they met any of the following exclusion criteria: (a) presence of neurological signs (e.g., perceived weakness in the lower limbs); (b) a diagnosed psychiatric disorder or severe cognitive impairment; (c) illiteracy; (d) difficulties understanding or communicating; and (e) insufficient Spanish language comprehension to follow the measurement instructions.

Measures

Pain Intensity

Self-reported pain was assessed using the Spanish version of the Visual Analog Scale (VAS). The VAS is a 10-cm line with 2 ends representing the extreme states of "no pain" and "pain as bad as it could possibly be." The VAS has shown good re-test reliability ($r = 0.94$) (17).

Self-efficacy

Self-efficacy was assessed through the Spanish version of the Chronic Pain Self-Efficacy Scale (CPSS), which has demonstrated acceptable psychometric properties (18). The scale was developed to measure perceived self-efficacy and the ability to cope with the consequences of pain in patients with chronic pain. This 19-item scale is a self-administered instrument with 3 domains that assess self-efficacy for pain management, physical functioning, and coping with symptoms, with higher scores indicating greater self-efficacy for managing pain.

Low Back Disability

Physical disability due to LBP was assessed using the Spanish version of the Roland-Morris Disability Questionnaire (RMDQ), which has demonstrated acceptable psychometric properties. The RMDQ is a 24-item self-administered questionnaire with a total score ranging from 0 to 24, with higher scores indicating higher levels of disability (19).

Fear of Movement

Fear of movement was assessed using the 11-item Spanish version of the Tampa Scale of Kinesiophobia (TSK-11), whose reliability and validity have been demonstrated (20). TSK-11 consists of 2 subscales, one related to fear of physical activity and the other related to fear of harm. The final score can range from 11 to 44 points, with higher scores indicating greater perceived kinesiophobia.

Pain Catastrophizing

The Spanish version of the Pain Catastrophizing Scale (PCS) assesses the level of pain catastrophizing and is a reliable and valid measure of pain catastrophizing. The PCS consists of 13 items and is structured by 3 factors: rumination, magnification, and helplessness. The items are answered with a numeric value between 0 (not at all) and 4 (all the time), resulting in a maximum score of 52 points, with higher scores indicating grater pain catastrophizing (21).

Fear Avoidance Beliefs

Fear avoidance beliefs were assessed through the Fear Avoidance Beliefs Questionnaire (FABQ). The FABQ has 16 items, each scored from 0 to 6, with higher numbers indicating higher levels of fear avoidance. The questionnaire is structured with the 2 factors of work and physical activity (22,23).

Procedure and Apparatus to Evaluate the Physical Variables

After agreeing to participate, all patients were given a sociodemographic questionnaire to complete on the day of the measurement. The questionnaire gathered information on gender, date of birth, marital status, and educational level. Patients were not to have undergone any training within 24 hours prior to the measurement. Each patient then completed a set of self-reported measures.

A physiotherapist instructed the patients on the physical test to be performed, and the patients were supervised during the session. The evaluation lasted 30 minutes, and the patients were informed that they might feel a temporary increase in discomfort during the temporal summation lifting task and that they were free to discontinue the task at any point.

The first test performed was the evaluation of the lumbar range of motion in the flexion movement. For this assessment, we employed a digital inclinometer based on the mobile application iHandy (24). The protocol consisted of the following process: The patients stood with their arms at their sides. The physiotherapist then marked the spinous process of T12 and S2 to place the mobile device. The patients then performed maximum trunk flexion (25). Three measurements were performed, and the average of the differences between the 2 reference points was calculated (Fig. 1).

We then measured the temporal summation lifting task. The lifting task was based on the protocol described by Sullivan et al (26). The patient stood in front of a table on which lay 18 canisters with varying weights: 2.9, 3.4, and 3.9 kg. The canisters were placed in 6 columns and 3 rows so that the weights were distributed according to the rows. The table's height was adjusted so that the handle of the canister in the first row was at standing elbow height. The patients had to lift the canisters with their dominant arm, starting with the first column. The sequence to follow began with column 1, ascending by rows. In this manner, the physiotherapist evaluated the pain intensity at the end of each column (Fig. 2). The index of temporal summation of repetitions was obtained when performing the process for the 6 columns. To facilitate the process, each letter was assigned in alphabetical order, and the patients were instructed to lift the weights in that order. While lifting the weights, patients assumed 3 trunk positions: In the first position, the elbow had to be flexed by 90º; in the second position, the patient had to perform a complete elbow extension; and in the third position, the patient had to combine the complete elbow extension with lumbar flexion to increase the load in that region (27,28).

Lastly, we measured postural stability in 3 directions (forward, lateral right, and left). The measurement was obtained through the movement achieved by the patient (in cm) by shifting the center of gravity to the limits of the support base, while the feet remained stationary (Fig. 3). The Multi-Directional Functional Reach Test (MDFRT) has shown good intrarater, interrater, and test-retest reliability (29). The evaluation employed a measuring device consisting of a tripod with a rigid tape measure, parallel to the floor, which was placed at the height of each patient's acromion. Patients placed both arms at 90º flexion, with the elbows and hands at

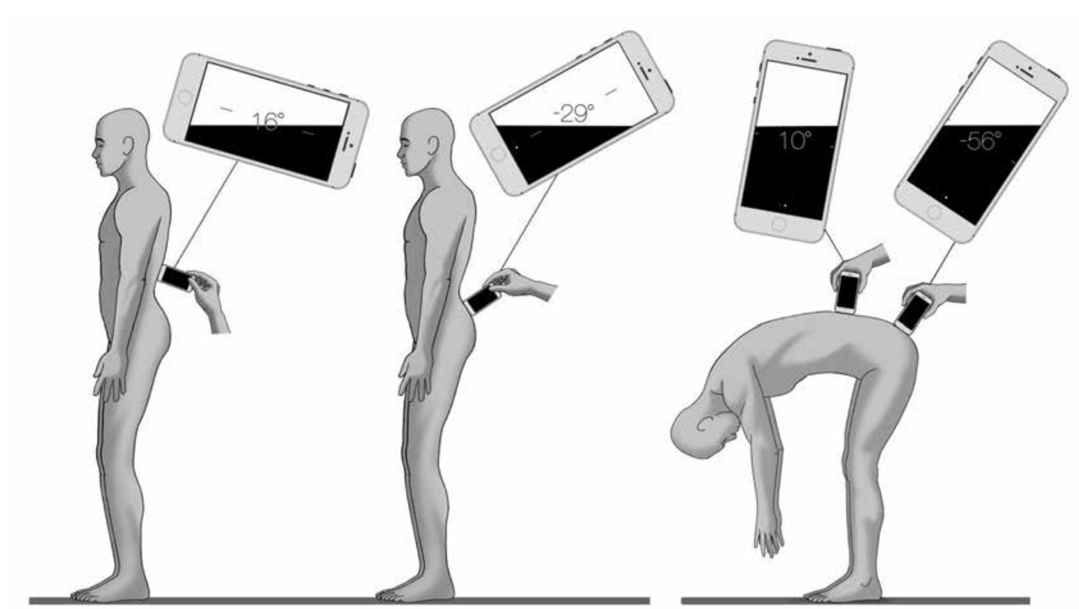

Fig. 1. *Evaluation protocol of the lumbar range of motion in the flexion movement.*

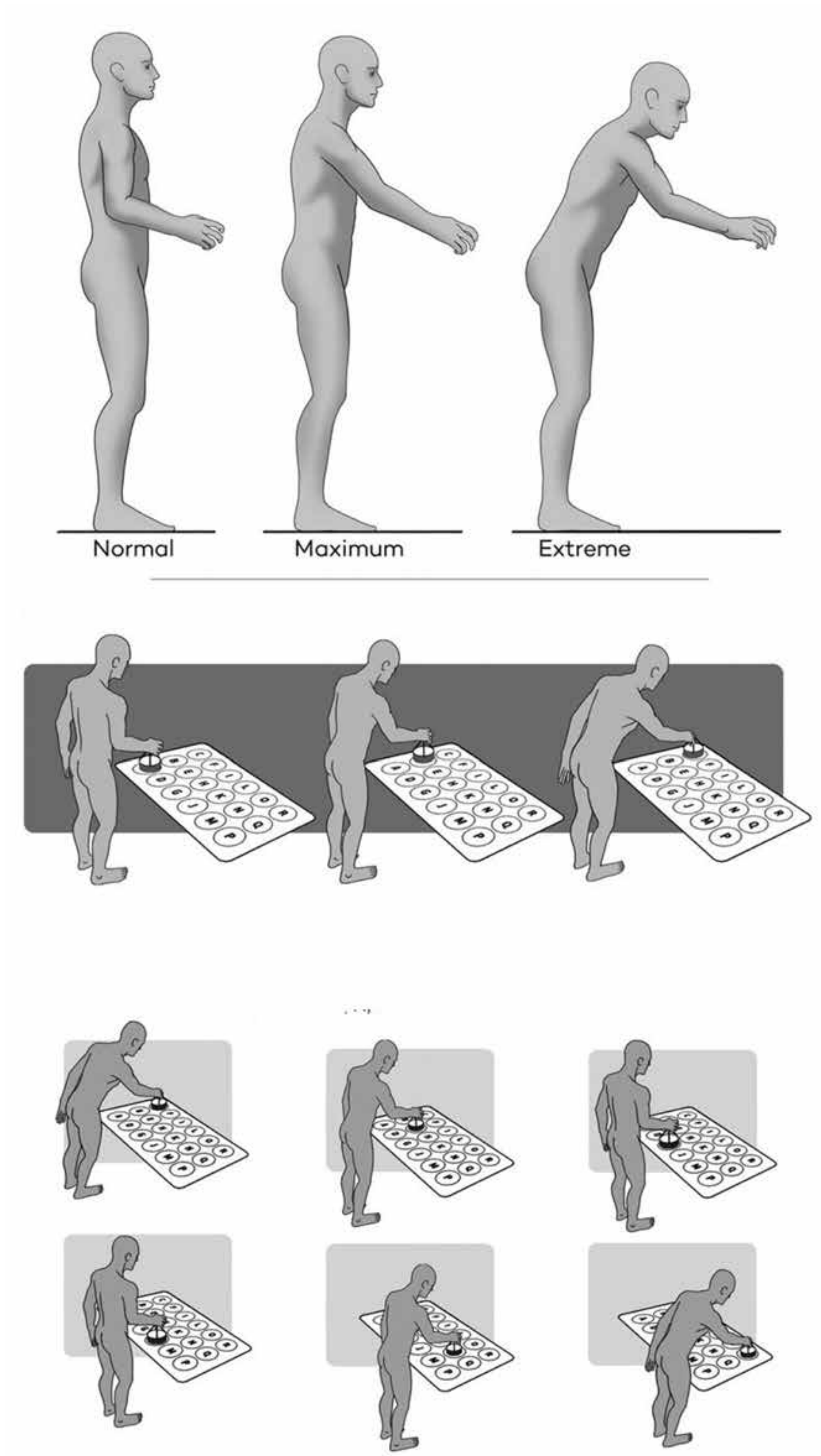

Fig. 2. *Canister positions, weights, lift sequence used in the canister-lifting task and postural positions.*

full extension. They then had to reach as far as possible while maintaining the posture for 2–3 seconds without lifting their feet off the ground (29,30).

Data Analysis

We analyzed patients' sociodemographic and clinical data, which were summarized using frequency counts, descriptive statistics, summary tables, and figures. The data analysis was performed using SPSS Version 20.0 (IBM Corporation, Armonk, NY). The categorical variables are shown as frequencies and percentages. The quantitative results of the study are represented

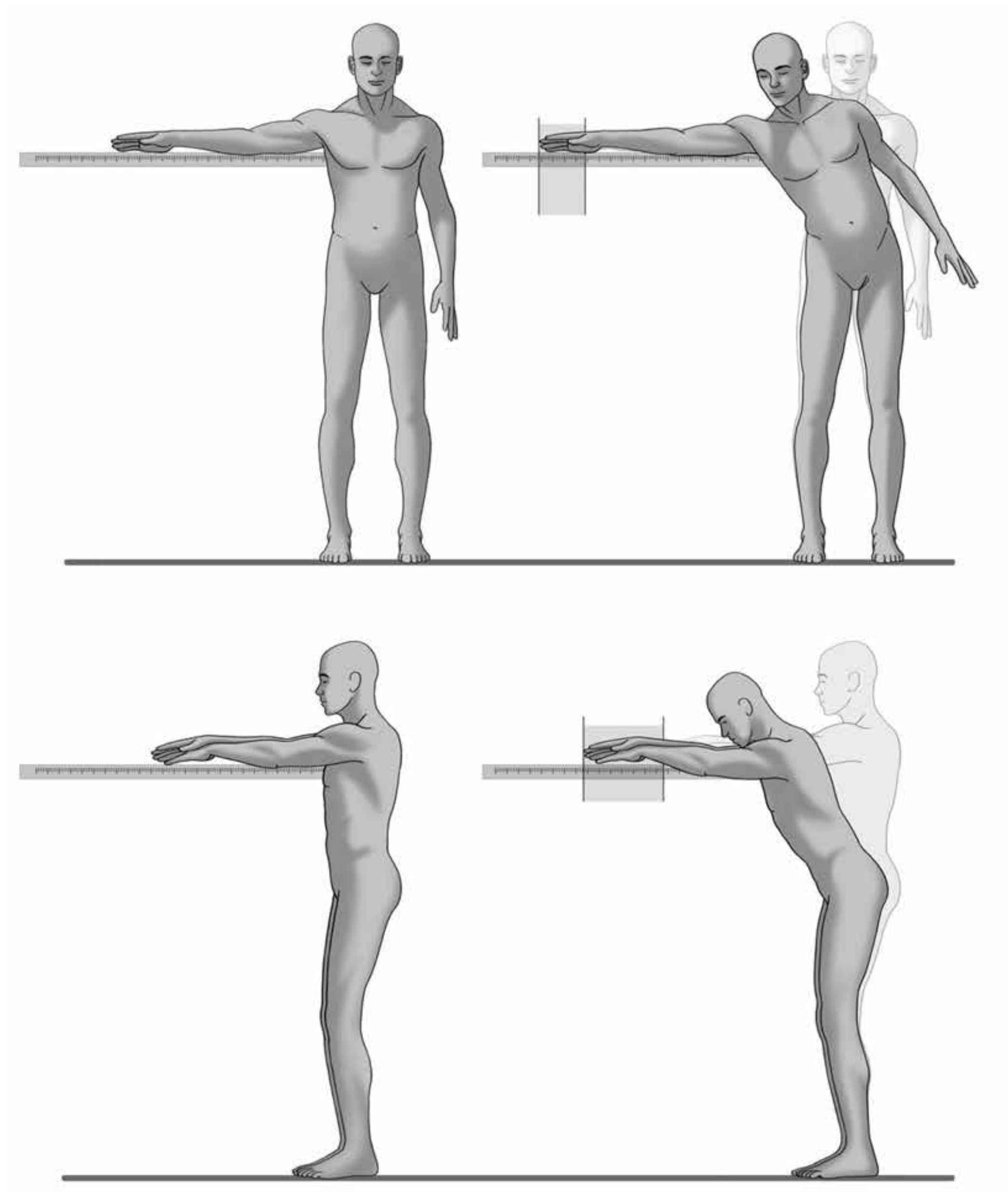

Fig. 3. *Position to measure postural stability.*

by descriptive statistics (CI, mean, and standard deviation [SD]). For all variables, the z score was assumed to follow a normal distribution based on the central limit theorem because all groups had at least 30 patients (31,32). The Student t test was employed for group comparisons for all variables except the temporal summation lifting task. The repeated-measures ANOVA test was used to compare values of the temporal summation lifting task variable across the factors of group and time (the process for the 6 columns). Partial eta-squared (η_p^2) was calculated as a measure of effect size (strength of association) for each main effect and interaction in the ANOVAs, with 0.01–0.059 representing a small effect, 0.06–0.139 a medium effect, and > 0.14 a large effect (33).

We calculated Cohen's *d* effect sizes for multiple comparisons of the outcome variables. According to Cohen's method, the magnitude of the effect was classified as small (0.20–0.49), medium (0.50–0.79), or large (0.80). The relationships between the psychological variables, as well as the physical variables, were examined using Pearson correlation coefficients. A Pearson correlation coefficient greater than 0.60 indicated a strong correlation, a coefficient between 0.30 and 0.60 indicated a moderate correlation, and a coefficient below 0.30 indicated a low or very low correlation (34).

Results

The baseline sociodemographic characteristics of the sample are summarized in Table 1. The total study sample consisted of 60 patients with NSCLBP (35 women and 25 men). Table 1 shows no statistically significant differences between the groups in terms of age, pain intensity, and pain chronicity. There were statistically significant differences between the groups by gender, educational level, weight, height, marital status, and employment status (Table 1).

Physical Variables

The patients in the low self-efficacy group presented a shorter lumbar range of motion and lower postural stability, in addition to greater pain intensity in the temporal summation lifting task, compared with the patients in the high self-efficacy group. The Student t test (for independent samples) revealed significant differences between the groups for the lumbar range of motion (t = -3.46; $P < .01$; d = -0.89) and temporal summation lifting task (F = 9.56; $P < .01$; $\eta^2 = .141$) (Fig. 4), with a large effect size and for MDFRT in the forward direction (t = -2.02; $P < .05$; d = -0.52), with a moderate effect size. Table 2 shows the intergroup comparisons.

Psychological Variables

The low self-efficacy group showed greater values of the psychological variables and more disability compared with the high self-efficacy group. The Student t test (for independent samples) revealed significant differences between the groups for lumbar disability (t = 3.13; $P < .01$; d = 0.8), fear avoidance beliefs (t = 3.83; $P < .01$; d = 0.98), fear of movement (t = 2.54; $P < .01$; d = 1.17), and pain catastrophizing (t = 5.29; $P < .01$; d = 1.37), with a large effect size. Table 3 shows the intergroup comparisons.

Correlation Analysis

Table 4 shows the results of the correlation analysis examining the bivariate relationships among the psychological variables and physical variables (Table 4).

For the high self-efficacy group, the strongest correlations were found between fear of movement and the temporal summation lifting task (r = 0.711; $P < .01$). There was a positive relationship between self-efficacy for the physical functioning subscale and MDFRT in the forward direction (r = 0.738; $P < .01$). The analysis also found a negative relationship between self-efficacy for the pain management subscale and the temporal summation lifting task (r = -0.730; $P < .01$).

For the low self-efficacy group, the strongest correlations were obtained between pain catastrophizing and the temporal summation lifting task (r = 0.765; $P < .01$). Specifically, there was a positive correlation between pain catastrophizing for the magnification subscale and the temporal summation lifting task (r = 0.780; $P < .01$). The analysis also found a negative relationship between self-efficacy for the pain management subscale and MDFRT in the lateral right direction (r = -0.487; $P < .01$), and there was a negative correlation between the self-efficacy for coping with symptoms subscale and MDFRT in the forward direction (r = -0.603; $P < .01$). Finally, a strong negative correlation was found between pain catastrophizing for the magnification subscale and lumbar range of motion (r = -0.759; $P < .01$).

Discussion

The main objective of this study was to compare the process of repetition-induced summation of activity-related pain, the range of motion in lumbar flexion, and the postural stability of patients with NSCLBP based

Table 1. *Descriptive statistics for sociodemographic data.*

Measures	Low Self-efficacy Group (n = 30)	High Self-efficacy Group (n = 30)	*P* value, t test (independent samples) or chi-square test
Age	36.53 ± 13.83	38.17 ± 12.24	0.63
Gender			< 0.01**
Men	7 (23.3)	18 (60)	
Women	23 (76.7)	12 (40)	
Height (cm)	165.07 ± 7.23	171.70 ± 9.41	< 0.01**
Weight (kg)	60.73 ± 10.09	75.73 ± 13.13	< 0.01**
Marital Status			0.01*
Single	20 (66.7)	15 (50)	
Married	6 (20)	15 (50)	
Widow	4 (13.3)	0 (0)	
Employment Status			< 0.01**
Active	13 (43.3)	27 (90)	
Unemployed	11 (36.7)	3 (10)	
Retired	6 (20)	0 (0)	
Educational Level			0.01*
Primary education	4 (13.3)	0 (0)	
Secondary education	8 (26.7)	17 (56.7)	
College education	18 (60)	13 (43.3)	
Pain Intensity (VAS)	44.13 ± 11.59	39.57 ± 9.62	0.10
Chronicity	69.67 ± 51.14	79.20 ± 79.76	0.58
CPSS	138.53 ± 14.91	174.77 ± 6.53	< 0.01**
CPSS_CS	52.37 ± 10.24	73.57 ± 6.92	< 0.01**
CPSS_PF	51.70 ± 7.72	57.13 ± 3	< 0.01**
CPSS_PM	38.17 ± 10.29	45.4 ± 5.42	< 0.01**

Values are presented as mean ± SD or number (%); *$P < 0.05$; ** $P < 0.01$; VAS: Visual Analog Scale; CPSS: Chronic Pain Self-Efficacy Scale; CPSS_CS: Coping with Symptoms subscale; CPSS_PF: Physical Functioning subscale; CPSS_PM: Pain Management subscale.

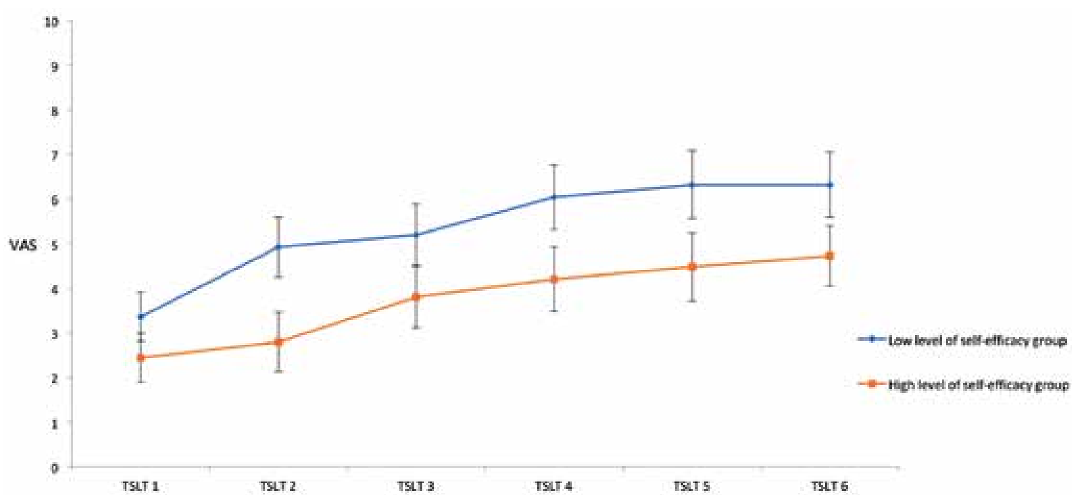

Fig. 4. *Comparison of pain intensity to the temporal summation lifting task between the 2 groups. VAS: Visual Analog Scale; TSLT: temporal summation lifting task.*

Table 2. Descriptive statistics and results for the physical variables

Measures	Low Self-efficacy Group (n = 30)	High Self-efficacy Group (n = 30)	Difference of Means (95% CI); Effect Size (d)
LROM	49.63 ± 11.28	65.87 ± 23.08	-16.23 (-25.62 to 6.84)**; d = -0.89
MDFRT_F	20.97 ± 2.87	22.77 ± 3.95	-1.8 (-3.58 to -0.01)*; d = -0.52
MDFRT_R	18.37 ± 2.22	21.53 ± 3.28	-3.16 (-4.61 to -1.71)**; d = -1.13
MDFRT_L	19.97 ± 2.20	21.63 ± 2.20	-1.66 (-2.8 to -0.52)**; d = -0.75
TSLT 1	3.47 ± 0.9	2.17 ± 1.93	1.3 (0.52-2.07)**; d = 0.86
TSLT 2	5.07 ± 1.33	2.5 ± 2.22	2.56 (0.47-1.61)**; d = 1.40
TSLT 3	5.37 ± 1.40	3.47 ± 2.25	1.9 (0.93-2.87)**; d = 1.01
TSLT 4	6.23 ± 1.67	3.87 ± 2.24	2.36 (1.34-3.38)**; d = 1.19
TSLT 5	6.53 ± 1.79	4.17 ± 2.35	2.36 (1.28-3.44)**; d = 1.13
TSLT 6	6.5 ± 1.69	4.40 ± 2.29	2.10 (1.05-3.14)**; d = 1.04
TSLT _Total	5.52 ± 1.39	3.42 ± 2.16	2.10 (1.15-3.04)**; d = 1.16

Values are presented as mean ± SD. **P* < 0.05; ***P* < 0.01; LROM: Lumbar Range of Motion; TSLT: Temporal Summation Lifting Task; MDFRT_F: Multi-Directional Functional Reach Test Forward; MDFRT_R: Multi-Directional Functional Reach Test Forward Lateral Right; MDFRT_L: Multi-Directional Functional Reach Test Forward Lateral Left.

Table 3. ***Descriptive statistics and results for the psychological variables***

Measures	Low Self-efficacy Group (n = 30)	High Self-efficacy Group (n = 30)	Difference of Means (95% CI); Effect Size (d)
TSK_11	29.43 ± 5.22	22.23 ± 6.92	7.2 (4.02-10.37)**; d = 1.17
PCS_Total	17.50 ± 7.95	8.07 ± 5.66	9.43 (5.86-13.00)**; d = 1.37
PCS_R	5.8 ± 3.69	2.03 ± 2.88	3.76 (2.05-5.47)**; d = 1.14
PCS_M	4.37 ± 2.07	3.07 ± 1.41	1.3 (0.38-2.21)**; d = 0.73
PCS_H	7.33 ± 3.01	2.97 ± 2.73	4.36 (2.88-5.85)**; d = 1.52
RMDQ	5.9 ± 1.68	4.57 ± 1.61	1.33 (0.48-2.18)**; d = 0.8
FABQ	32.50 ± 14.21	20.13 ± 10.52	12.36 (5.90-18.83)**; d = 0.98
FABQ_PA	15.63 ± 5.79	15.93 ± 9.95	-0.29 (-4.52 to 3.93); d = -0.04
FABQ_W	16.87 ± 13.12	8.77 ± 10.47	8.1 (1.96-14.23)**; d = 0.68

Values are presented as mean ± SD. **P* < 0.05; ***P* < 0.01; TSK-11: Tampa Scale of Kinesiophobia; PCS: Pain Catastrophizing Scale; PCS_R: Rumination subscale, PCS_M: Magnification subscale; PCS_H: Helplessness subscale; RMDQ, Roland-Morris Disability Questionnaire; FABQ: Fear-Avoidance Belief Questionnaire; FABQ_PA: Physical Activity subscale; FABQ_W: Work subscale.

on their self-efficacy level. The secondary objective was to analyze whether there were relationships between the physical variables described above and psychological and disability variables.

Considering the results of this study regarding the physical variables, we showed that the patients with NSCLBP with a lower level of self-efficacy had greater pain intensity when faced with the process of repetition-induced summation of activity-related pain. These patients also showed a shorter range of motion in the flexion gesture and lower postural stability. These results indicate that the level of self-efficacy not only affects the psychosocial sphere but can also interfere with physical performance and can even result in functional limitation.

Currently, self-efficacy is a variable of considerable interest at the clinical and research levels. It has been shown that, for patients with LBP, self-efficacy is a predictor of recovery. Research studies have also found that self-efficacy contributes in considerable measure to a person's experience of pain when considering the 3 dimensions of pain: cognitive-evaluative, affective-motivational, and sensory-discriminative (35-39). We should therefore note that the level of self-efficacy can

Table 4. *Pearson correlation coefficients between variables analyzed in the study {AU: correlation coefficients in table should have 0 before decimal point}*

		TSLT 1	TSLT 2	TSLT 3	TSLT 4	TSLT 5	TSLT 6	TSLT _Total	LROM	MDFRT_F	MDFRT_R	MDFRT_L
TSK_11	Low self-efficacy group	0.579**	.677**	-580**	.729**	.688**	.722**	.705**	-.539**	.146	.286	.238
	High self-efficacy group	.711**	.717**	-719**	.622**	.694**	.700**	.711**	-.344	-.352	.032	-.066
PCS	Low self-efficacy group	.627**	.785**	.571**	.721**	.889**	.709**	.765**	-.520**	.270	.089	.270
	High self-efficacy group	.575**	.623**	.629**	.563**	.563**	.591**	.606**	.117	-.356	.050	-.213
PCS_R	Low self-efficacy group	.517**	.730**	.441*	.661**	.824**	.683**	.691**	-.403*	.191	.207	.517**
	High self-efficacy group	.099	-.405*	.013	-.188	.674**	.707**	.613**	.540**	.595**	.595**	.629**
PCS_M	Low self-efficacy group	.736**	.736**	.734**	.738**	.825**	.680**	.780**	-.759**	.210	-.180	.736**
	High self-efficacy group	-.320	-.307	-.151	-.128	-.201	-.157	-.213	510**	.404*	.452*	.130
PCS_H	Low self-efficacy group	.514**	.671**	.461*	.586**	.770**	.567**	.635**	-.358	.333	.105	.514**
	High self-efficacy group	.647**	.706**	.735**	.663**	.645**	.710**	.702**	-.125	-.520**	-.144	-.311
RMDQ	Low self-efficacy group	-.059	.049	-.071	-.101	.075	.018	-.011	-.451*	-.235	-.293	-.059
	High self-efficacy group	.234	.351	.437*	.365*	.347	.383*	.365*	-.229	-.103	-.176	-.522**
FABQ	Low self-efficacy group	.173	.125	.414*	.153	.082	.251	.206	-.269	-.326	-.597**	.173
	High self-efficacy group	.279	.317	.372*	.345	.370*	.273	.335	.652**	.308	.360	.011
FABQ_PA	Low self-efficacy group	.438*	.520**	.586**	.464**	.467**	.447*	.510**	-.355	.169	-.129	.438*
	High self-efficacy group	.043	.028	.067	.117	.120	.092	.081	.648**	.500**	.729**	.330
FABQ_W	Low self-efficacy group	-.006	-.094	.190	-.039	-.117	.074	-.002	-.135	-.427*	-.590**	.158
	High self-efficacy group	.208	.203	.237	.282	.244	.124	.222	.879**	.184	.039	-.107

*$P < .05$; **$P < .01$; TSK_11: Tampa Scale for Kinesiophobia; PCS: Pain Catastrophizing Scale; PCS_R: Rumination subscale, PCS_M: Magnification subscale; PCS_H: Helplessness subscale; RMDQ: Roland Morris Disability Questionnaire; FABQ: Fear-Avoidance Belief Questionnaire; FABQ_PA: Physical Activity subscale; FABQ_W: Work subscale; TSLT: Temporal Summation Lifting Task; LROM: Lumbar Range of Motion; MDFRT_F: Multi-Directional Functional Reach Test Forward; MDFRT_R: Multi-Directional Functional Reach Test Forward Lateral Right; MDFRT_L: Multi-Directional Functional Reach Test Forward Lateral Left.

affect physical, functional, psychological, and disability variables.

A study conducted by Martel et al in 2012 showed that patients who had nonverbal pain behaviors or protective behaviors when faced with physical activities that involved the pain area in question demonstrated reduced range of motion, functional limitation, and even impaired performance when faced with the motor task, which could indicate higher disability rates and lower self-efficacy (40,41). With regard to self-efficacy, studies have observed the process of repetition-induced summation of activity-related pain in various populations with chronic pain and have shown that the process is correlated with disability variables and perceived work load (41–43). Regarding the postural stability variable, a study conducted by Sánchez-Herán et al compared physical, psychological, and disability variables between patients with pain and knee osteoarthritis and patients with pain and knee and hip osteoarthritis. The authors observed no differences between the groups for the psychological and disability variables. However, the knee and hip osteoarthritis group showed a significantly lower functional reach in the 3 directions (44). The authors also found a moderate positive correlation between the patient's self-efficacy level and functional reach. Self-efficacy when faced with pain was a predictor of postural stability (44).

It is therefore important to assess self-efficacy beliefs and types of coping strategies for chronic pain because they consistently correlate with perceived pain intensity and the functionality present when facing various situations (41,44–49).

Taking into account the results from the psychological and disability variables, we showed that patients with NSCLBP with lower self-efficacy when dealing with their pain show higher rates of fear of movement and catastrophism when facing pain, as well as fear-avoidance behaviors and higher rates of lumbar disability than those who have higher self-efficacy levels.

Studies have observed that a patient's self-efficacy level can determine the types of coping strategies used when facing pain, because the lack of self-efficacy can entail pain-avoidance behaviors and even promote nonverbal pain behaviors such as the taking of medication (50–52). A study by Du et al in 2017 concluded that self-efficacy and active coping strategies were protective factors for patients with CLBP, whereas fear-avoidance behaviors and passive coping strategies were risk factors for this population (53).

The results of our study are supported by previous studies that demonstrated correlations between the lack of self-efficacy and the involvement of these types of variables in various populations with chronic pain (15,54). A study conducted by Martín-Aragon et al found that negative expectations and negative beliefs of self-efficacy were correlated with psychological variables such as anxiety and depression, as well as an increased pain intensity in patients with chronic pain (18). A study conducted by Sullivan et al with 90 patients with CLBP (on which we based our study protocol) segmented the sample based on pain catastrophizing, fear of movement, and depression. That study concluded that the patients with greater pain catastrophizing showed significant differences in terms of pain intensity {AU: instead of "showed significant differences in terms of pain intensity" can you just say they experienced greater pain intensity?} compared with those who presented less catastrophism in the repetition-induced summation of activity-related pain process. When the sample was segmented based on the depression index and fear of movement, there were no statistically significant differences between the groups (55). Another study showed that self-efficacy level is a better predictor of disability than fear avoidance and pain intensity for patients with subacute, recurring, or chronic musculoskeletal pain (14). It is important to note that previous studies have observed significant negative correlations between self-efficacy, disability, pain catastrophizing, and fear of movement (14,56,57). Based on these findings, a study by Woby et al on patients with NSCLBP observed that, with high levels of self-efficacy, the presence of fear of movement and pain catastrophizing beliefs did not cause a significant increase in symptoms (49).

Numerous studies have indicated that we should focus on the influence of psychological and disability factors in patients with chronic pain because they are essential to improving the quality of life and functionality of this population (58,59).

Study Limitations

This study has several limitations that should be considered. A significant limitation of the study is that the physical activity levels were not assessed, which could have influenced their ability to perform motor tasks at the perceived difficulty and fear level. Another important limitation to take into account is that we did not evaluate the medication intake of the patients, which could have influenced their levels of self-efficacy.

Finally, it would be interesting in future studies to assess aspects such as patient motivation and acceptance because it has been observed that these aspects can interfere with the fear and difficulty level when performing a motor task (60-63).

Conclusions

The results of this study show that patients with NSCLBP and a high level of self-efficacy have a greater capacity for performing various motor tasks, a wider range of motion and greater functional reach, as well as a lower influence of psychological and disability factors on their experience of pain.

This is the first study that has evaluated the functional, physical, and psychological variables of patients with NSCLBP based on their level of self-efficacy when faced with pain. Based on these results, we believe it is important to consider the patient's level of self-efficacy when establishing treatment objectives and phases.

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