

The relationship between self-report measures, flexibility, and functional performance in women with chronic low back pain

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Abstract

Background: Evaluating disability in individuals with chronic low back pain (CLBP) involves various approaches, including self-reported measures, flexibility assessments, and functional performance tests that mimic activities of daily living (ADLs). However, the relationships among these outcomes remain unclear, raising concerns about the reliability of conclusions based on a single assessment. This study aims to examine the correlation between self-reported disability, flexibility, and functional performance in ADLs among women with CLBP. The findings will provide valuable insights for exercise specialists in assessing disability and designing targeted interventions for CLBP patients. **Materials and Methods:** Twenty-four women with CLBP of a mean intensity of 5.33 ± 1.40 over the past three months participated in the study. The outcome measures included the Rolland Morris disability questionnaire (RMDQ), flexibility tests [modified fingertip-to-floor distance (MFFD) and straight leg raise test (SLRT)], and functional performance in activities of daily living (ADL) tests [standing-to-prone (StP), prone-to-standing, supine-standing-supine (SSS), 5 times sit-to-stand, and timed up and go]. Correlations were assessed using Pearson's correlation coefficients (r). **Results:** The RMDQ was only correlated with one ADL test, the StP. There were no significant correlations between flexibility and ADL tests. Only the SLRT on the left leg showed a moderate correlation with the SSS test, an unexplained finding owing to the absence of observational data. **Conclusions:** The RMDQ, flexibility, and ADL tests rarely correlated with each other, suggesting they represent distinct constructs that measure different outcomes. Therefore, exercise trainers are recommended to incorporate both self-reported and performance-based assessments when evaluating disability in CLBP patients. Additionally, alongside quantitative measures, qualitative assessments should be used to evaluate movement quality during ADLs.

Keywords: spinal pain, disability, fingertip-to-floor, lumbar flexion, stand-to-floor, range of motion (ROM) measurements

Introduction

Low back pain (LBP) is the greatest contributor to the burden of disability worldwide, while by 2050, the number of LBP incidences is expected to rise by 36.4% (Ferreira et al., 2023). In many occasions, this musculoskeletal disorder can become chronic, i.e. persist more than 12 weeks, a situation that affects nearly 20% of the population globally (Tagliaferri et al., 2020). The prevalence of chronic LBP (CLBP) gradually increases from the age of 30 through to 60 years old, especially in women. CLBP may be a highly disabling condition that causes suffering to the individuals (Meucci, Fassa, & Faria, 2015) both physically as well as psychologically, resulting in poor quality of life (Du, Liu, Cai, Hu, & Dong, 2020). Therefore, priorities for its management, in order of importance, are the reduction of disability (i.e. the improvement of physical functioning), the relief of pain and the enhancement of health-related quality of life (Chiarotto, Terwee, & Ostelo, 2017; George et al., 2021).

Disability has been defined as a “restriction of performing activities of daily living” (ADLs) and, as it has been reported, this is the strongest motivator for an individual to seek care and not pain intensity (Tagliaferri et al., 2020). Various therapeutic interventions may lead to the improvement of functional capacity, with exercise being one of the most often recommended short-term approaches (Fernández-Rodríguez et al., 2022). In order to evaluate the effectiveness of therapeutic interventions, exercise specialists use specific measurements tools. These measures, in a clinical context, have been divided in patient reported outcome measures (PROMs) and clinician-based outcome measures (CROMs) (Zdravkovic et al., 2022). PROMs consist of questionnaires of adequate psychometric properties in which the individuals report the level of disability by means of specific questions. CROMs are specific tests whose scores are measured by the rehabilitation specialist and may be either

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objectively measured [e.g. assessment of range of motion (ROM)/flexibility and/or performance in movements that simulate ADLs] or subjectively measured (i.e. observation of movement quality). The selection of appropriate outcome measures is crucial, since through them it is possible to evaluate if the situation of an individual improved, deteriorated or remained unchanged (Zdravkovic et al., 2022). Apart from that, in the initial stage of rehabilitation, properly selected tests may provide valuable information on the severity of the situation and on the needs of the CLBP patients which may impact on subsequent decisions.

In the field of exercise, when evaluating and reporting disability of patients with CLBP, researchers very often rely exclusively in self-report questionnaires, like the Rolland Morris Disability Questionnaire (RMDQ) and the Oswestry Disability Index (Fernández-Rodríguez et al., 2022). Considering that in some researches it has been found that PROMs are highly correlated with ROM (i.e. lumbar flexion) (Atya, 2013), in a first sight, it could be suggested that the exercise trainer could select one of these outcome measures and not lose time to also use the other. Nevertheless, it has also been found that in many cases, the scores of self-reported measures do not correlate with those of functional capacity assessments (De Castro et al., 2020; Parks, Crichton, Goldford, & McGill, 2003), indicating a mismatch between the subjective beliefs of the individuals regarding their capacities and their actual performance (Pfingsten, Lueder, Luedtke, Petzke, & Hildebrandt, 2014; Simmonds et al., 1998; Tagliaferri et al., 2020). This is a sign that PROMs cannot substitute performance-based tests. Disability is also assessed through flexibility measurements, which traditionally focus on lumbar flexion (Alqhtani, Jones, Theobald, & Williams, 2015) using tests such as the Fingertip to Floor Distance and the Sit and Reach Test (Malliou, Gioftsidou, Beneka, & Godolias, 2006). However, although flexibility tests have traditionally been the standard to determine disability, their value in this regard is questioned by some researchers: as it has been shown lumbar range of motion does not correlate with the scores obtained from physical functioning tests that simulate ADLs (Parks et al., 2003). Since ROM assessments may not predict functional performance even in activities that are executed at the same plane of movement (Simmonds et al., 1998), some researchers recommend that ROM should not be used as a criterion to determine disability in patients suffering from CLBP (Parks et al., 2003). As it has been discussed, the measurement of lumbar flexion alone is unlikely to provide accurate kinematic insights into other movements (Alqhtani et al., 2015). On top of that, many CLBP patients do not have a reduced lumbar flexion or may be even hypermobile (Parks et al., 2003). For these reasons, when assessing disability, many investigators recommend to not rely on “impairment measures” (as ROM measures are), but to use functional performance tests that simulate ADLs which may be compromised by pain (Alqhtani et al., 2015; Sakulsriprasert, Vachalathiti, & Kingcha, 2020; Simmonds et al., 1998). Nevertheless, others, question the sensitivity of ADL tests, advocating that they may present a ceiling effect in less disabled persons. Thus, they recommend that they are reserved for the more disabled ones and be used in combination with self-report measures (Tagliaferri et al., 2020). However, it is also true, that different studies conclude to different results regarding the correlations between different tests, since some of them have found significant and high correlations between self-report and performance-based measures of activity limitations (Caporaso, Pulkovski, Spratt, & Mannion, 2012; Lee, Simmonds, Novy, & Jones, 2001; Simmonds et al., 1998). Therefore it becomes difficult to propose a “one size fits all” approach and more research is needed on the topic in order to understand in what extent there are correlations between different tests. The importance of such investigation is due to the fact that if strong correlations are established between different tests, then exercise specialists could avoid the ones that are not necessary, saving time. On the other hand, if weak correlations are observed, this would be an indication that different tests are needed when assessing disability in patients with CLBP.

Taking into account the above, the aim of the present research was to investigate if a self-report measure of disability (RMDQ), flexibility assessments [MFFD, Straight Leg Raise Test (SLRT)] and functional performance in tests that simulate ADLs (measured by five different functional tests) correlate significantly in women with CLBP.

Materials & Methods

Inclusion and exclusion criteria

Inclusion criteria were: to be an adult woman with CLBP, and have score in a Numeric Rating Scale (NRS) equal or more than 3 points in the last three months, in the last month and in the day of measurement. Exclusion criteria were: to have co-existing significant cardiorespiratory, cardiovascular, vascular, oncological, neoplastic, rheumatological, neurological or psychiatric disease, severe metabolic disease or neuromuscular disorders; any other serious orthopedic problem; a history of spinal cord surgery or a large intervertebral disc herniation, severe scoliosis, severe spondylolisthesis, ankylosing spondylitis, congenital spinal cord deformities, whiplash neck injury, sciatica with pain intensity equal to or greater than low back pain; be pregnant.

Participants

24 sedentary women, from 31 to 61 years old (mean±SD: 47.66±7.68), with a BMI of 19.38 to 33.46 (24.75±0.38) who experienced CLBP, participated in the present research. Their mean intensity of pain, as this was measured by an 11-point NRS, was 5.33±1.40 in the last three months, 5.54±1.56 in the last month and 5.04±1.37 in the day of measurement.

Measurements

Rolland-Morris Disability Questionnaire (RMDQ)

The Greek version of RMDQ was used for the self-assessment of disability (Boscainos, Sapkas, Stilianessi, Prouskas, & Papadakis, 2003), since it is one of the most used questionnaires for patients with LBP (Grotle, Wilkens, Garratt, Scheel, & Storheim, 2013). It is a valid and highly reliable tool (Cronbach alpha= 0.885) for Greek-speaking patients with LBP, and is more sensitive in detecting changes mainly in individuals with mild or moderate disability (Bombardier, 2000; Boscainos et al., 2003; Grotle, Brox, & Vøllestad, 2005). In its original version it consists of 24 sentences/items (Grotle et al., 2013) that describe the ability or inability to perform ordinary ADLs.

The total score is the sum of the positive responses (Roland & Fairbank, 2000) and each positive response counts for one point. The final score can range from 0 (no disability at all) to 24 (extremely severe disability) (Pengel, Refshauge, & Maher, 2004).

Modified Fingertip-to-Floor Distance Test (MFFD)

MFFD was used to assess the combined ROM of the lumbar spine and the hips. It is a test of excellent validity (Perret et al. 2001) and very high reliability (Gauvin, Riddle, & Rothstein, 1990; Perret et al., 2001). The participant stood on a step. Keeping the feet joined, the knees extended and the middle fingers of the hands one above the other, she was asked to execute a pain-free spinal flexion, at the maximum of her capacity, to approach the ground as much as possible.

If the participant's fingers did not touch the step, the distance from the middle fingers to the step was recorded as a positive value (e.g. +10 cm). If the fingers went beyond the step, the distance was recorded as a negative value (e.g. -10 cm). If fingers touched the step without exceeding it, the result was recorded as zero (0) (Frost, Stuckey, Smalley, & Dorman, 1982). Each participant completed the test twice, with a self-chosen break between trials. The performance was measured using a tape measure and represented the average of both trials.

Straight Leg Raise Test (SLRT)

SLRT was used to evaluate hip ROM during hip flexion (i.e. hamstrings flexibility). It is a test of excellent reliability which is often used in LBP patients (Malliou et al., 2006; Neto, Jacobsohn, Carita, & Oliveira, 2015). The participant was in a supine position with legs relaxed. A plastic goniometer was used (35 cm axes, 0°-360° per 1°). Its fulcrum was positioned on the greater trochanter, its stationary arm was aligned with the trunk, parallel to the floor, and its moving arm was aligned with the outer femoral condyle (Beneka, Malliou, Pafis, Malliou, & Koutra, 2015; Neto et al., 2015).

The researcher raised one leg, while the participant was keeping the hip of the respective limb in neutral position, the knee in extension, and the ankle completely relaxed. The test ended when either pelvic rotation was starting to occur or great resistance was felt by the researcher (Neto et al., 2015) or when the participant asked so (Daskalaki et al., 2024). Two measurements per leg were taken in a row, starting with the right leg, and the average of each leg separately was recorded in degrees (°).

Functional tests (ADL tests)

In the next five ADL tests, two trials were conducted, allowing the participants as much rest as needed between trials. For timing, a Mio Coach PC3830A timer was used and the score was the average time from both trials in seconds and deciseconds. Timing began with “go” and stopped according to the test. The goal was to complete each trial as quickly as possible, while ensuring safety and remaining pain-free.

Standing-to-Prone Test (StP)

This test is called originally “Laying Prone on the Floor from the Standing Position” (Bakhtiary, Safavi-Farokhi, & Rezasoltani, 2005), but it was renamed in previous research, where also specific indications were given for its execution (Daskalaki, 2021; Daskalaki et al., 2024). The participant stood with feet at a comfortable distance apart and arms relaxed at the sides. On the command “go”, she rapidly dropped to the ground and assumed a prone position, placing the backs of the hands beneath the forehead. The timing stopped once the required position was assumed.

Prone-to-Standing Test (PtS)

This test is called originally “Standing up from Laying Prone on the Floor” (Bakhtiary et al., 2005), but it was renamed in previous research, where also specific indications were given for its execution (Daskalaki, 2021). It is the inverted version of StP. Each subject started from a prone position and, on the command “go”, rose to a standing position. The timing was stopped when the participant was immobilized in the standing position.

Standing-Supine-Standing (SSS)

This test is also called “Stand-to-Floor Test” (Caporaso et al., 2012; Pfingsten et al., 2014), but it was renamed in the present research in order to be clearly distinguishable from the previous two tests. It has been tested in individuals with LBP. Its inter- and intra- rater reliability values are 0.57 and 0.42 respectively, while it has been found to discriminate strongly participants with and without LBP (Pfingsten et al., 2014). The participant was standing with her back facing an exercise mat. With “go”, she had to descend to a supine position (with the head resting on the mat, arms next to the body and legs outstretched) and get back up to the standing position (Caporaso et al., 2012; Daskalaki, 2021).

5 Times Sit-to-Stand Test (5-StS)

The 5-StS has been controlled in individuals with LBP (Andersson, Lin, & Smeets, 2010) and has been found to be a responsive test (Sakulsriprasert et al., 2020) with adequate sensitivity to change (AUC= 0.70) (Andersson et al., 2010) and excellent reliability (Denteneer et al., 2018). The participant was seated in the centre of a chair with the trunk erect and without making contact with the backrest. The feet were flat on the floor and the arms were folded across the chest. With “go”, she should stand up (until knees were fully extended) and then return to the sitting position, five times. Timing stopped when the participant’s glutes made contact with the chair for the fifth time.

Timed Up and Go Test (TUG)

TUG is a highly reliable test (ICC=0.98) (Simmonds et al., 1998). The participant was seated in the centre of a chair with her arms casually by her sides. With “go”, she had to rise, walk three meters to a mark on the ground, turn, go back to the chair, and sit down. When the participant’s glutes made contact with the chair, the timing stopped.

Statistical Analysis

Statistical analyses were carried out with SPSS. The data for the variables examined were normally distributed as it was shown with Kolmogorov-Smirnov tests of normality ($p>0.05$). Pearson Correlations coefficients (r) were applied to examine the correlations between tests. Correlation was considered low for coefficients below 0.3, moderate for values between 0.3 and 0.5, and strong for coefficients greater than 0.5. (Cohen, 1998; Gandhi, Tsvetkov, Davey, Syed, & Mahomed, 2009). Additional values that are provided for characterizing even more the r values are “high” when $r=0.5-0.69$, and “very high” when $r=0.70-0.89$ (Makar, Skalski, Pęczak-Graczyk, Kowalski, & Grygus, 2022). Significance was set at $p < 0.05$.

Results

The participants exhibited a mild level of self-reported disability as this was assessed with RMDQ. 33% of them ($n=8$) were able to touch or even overcome the step in MFFD. The scores for all measurements are described in Table 1.

Table 1. Scores of the participants

Test	Score (Mean±SD)
RMDQ	4.17±3.28 points
MFFD	5.75±8.88 cm
Straight Leg Raise Test (Right)	77.83±9.15°
Straight Leg Raise Test (Left)	78.41±10.24°
Standing-to-Prone	3.48 ± 0.60 sec
Prone-to-Standing	3.75± 0.76 sec
Supine-Standing-Supine	7.12±1.92 sec
5 times Sit-to-Stand	11.48±3.32 sec
Timed Up and Go	6.14±0.99 sec

RMDQ was correlated only with StP and this correlation was negative, implying that as the score of RMDQ increased, the performance in StP worsened and vice-versa.

Flexibility tests (MFFD and SLRT) were not correlated with functional tests (StP, PtS, SSS, 5StS, TUG) most of the times. Only SLRT of the left leg was moderately correlated with SSS. The negative correlation between SLRT and SSS is due to the fact that in SSS a lower score indicates better performance. Therefore, better scores in SLRT correlated with better scores in SSS.

The inter-correlations among flexibility tests were strong. The negative correlation between MFFD and SLRT can also be explained because in MFFD a lower score indicates better performance (the same rationale as before).

The inter-correlations among functional tests were strong and all of them statistically significant, except for 5StS and TUG which were not significantly correlated. The stronger correlations were between StP and PtS ($r=0.808$), followed by PtS with SSS ($r=0.733$) and StP with SSS ($r=0.654$) (Table 2).

Table 2. Correlations of all variables

Tests		RMDQ	MFFD	SLRT (right)	SLRT (left)	StP	PtS	SSS	5StS
MFFD	r	-.249							
	p -value	.240							
SLRT (right)	r	-.001	-.582**						
	p -value	.997	.004						
SLRT (left)	r	-.116	-.595**	.895**					

	p-value	.600	.003	<.001					
StP	r	-.411	-.037	-.076	-.079				
	p-value	0.46*	.863	.731	.719				
PtS	r	-.185	.168	-.147	-.206	.808**			
	p-value	.387	.431	.504	.347	<.001			
SSS	r	-.135	.106	-.371	-.420*	.654**	.733**		
	p-value	.531	.623	.081	.046	<.001	<.001		
5StS	r	-.003	-.129	-.019	-.179	.454*	.512*	.588**	
	p-value	.990	.548	.933	.414	.026	.011	.002	
TUG	r	-.164	-.026	-.033	-.190	.547**	.538**	.502*	.391
	p-value	.444	.905	.883	.385	.006	.007	.013	.059

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

RMDQ: Rolland Morris Disability Questionnaire; MFFD: Modified Fingertip to Floor Distance; SLRT: Straight Leg Raise Test; StP: Standing-to-Prone; PtS: Prone-to-Standing; SSS: Supine-Standing-Supine; 5StS: 5 Times Sit-to-Stand; TUG: Timed Up and Go

Discussion

According to the results of the present study, self-report measures, flexibility and functional tests did not correlate most of the times, indicating that they are different constructs that measure different outcomes. First of all, the score of RMDQ was not significantly correlated with any other test, except for StP. This is an indication that self-reported disability in the present sample was not associated with actual performance in most of the cases. However, if we had used only StP, our conclusions would have been different, claiming that self-perceived disability matched objectively-measured performance. This issue has been already mentioned in the literature, i.e. that inconsistency and inconclusiveness in different studies regarding the relationship between self-report measures and actual performance may be due to the methodology applied including dissimilarity of measures used (Lee et al., 2001). For instance, and in contrast to the results here-found, in another study, RMDQ was strongly correlated with Fingertip-to-Floor Test ($r=0.51$) as well as with many different ADL tests, including SSS, with which it was moderately correlated ($r=0.40$) (Caporaso et al., 2012). However, the researchers suggested that both PROMs and CROMs should be used, since each one of them provides “a certain amount of unique information”. On the other hand, each sample of participants is also unique, therefore, correlations of different measures in a sample are not necessarily transferable to another one with different characteristics. Therefore, the choice to use both PROMs and CROMs is apt, because one cannot substitute the other in the piece of information they provide.

Similarly, flexibility tests were not correlated with functional performance in ADLs, except for SLRT of the left leg which was correlated moderately with SSS. In a previous study, it was found that SLRT of the affected side of women with LBP and radicular pain was associated with RMDQ scores (Ekedahl, Jönsson, & Frobell, 2010). It has also been proven that pain that has not a radicular cause may be present not only at the back but also at the thighs and glutes (Borges, Mezencio, Pinho, & Serrão, 2023) which would interfere with lower limbs functioning. Although direct comparisons cannot be made, it could be hypothesized that our participants had more prominent pain at one side of their body that made them use more the unaffected side, necessity that was imposed by the greater complexity of SSS in relation to the other ADL tests. As it has been earlier established, there are various movement patterns when rising from a supine position which may include symmetrical or asymmetrical components, even in younger pain-free subjects (VanSant, 1998). Therefore, considering that pain was also present in our participants on the day of the trial, it seems plausible to hypothesize that left hamstrings' flexibility determined performance due to domination of asymmetrical movement patterns during SSS. However, since we did not include an observational evaluation during the assessments, we cannot be sure for these hypotheses. Therefore, it seems reasonable to suggest that exercise specialists incorporate not only quantitative but also qualitative measures in their assessments to evaluate movement quality, as it has been already proposed by other researchers (Malliou et al., 2006; Pfingsten et al., 2014; Simmonds et al., 1998). For example, video-recording could be used from the part of the exercise trainer which would permit a thorough observation of movement patterns even after the evaluation session (VanSant, 1998). As for the non-significant correlation between MFFD and “flexion-based” ADL tests (i.e. StP, PtS and SSS), although at first could seem odd, there is a good explanation for this: MFFD is executed in a controlled manner, while functional performance tests must be performed with the maximum possible speed. A similar argument has been made by Simmonds et al (1998) when discussing the low correlation between static lumbar flexion and timed repeated dynamic flexion (i.e. 10 quick spinal flexions from a standing position). According to them, the latter demands greater neuromuscular control, trying to anticipate the complexity of lumbar-pelvic movement. Similarly, Alqhtani et al. (2015) have supported that flexion of the spine challenges the lumbar spine and hips differently than other functional tests which are performed in the sagittal plane, therefore, for assessing the musculoskeletal condition of an individual, functional tests are necessary. To this argument, it should be added, that MFFD is

executed with the lower limbs straighten, a condition that is not mandatory when executing the above-mentioned functional tests, while 33% of our participants had an excellent score in this test. Therefore, it could be concluded that although MFFD measures lower back and hips ROM in an end-point position, this ROM is neither necessarily used when executing ADLs nor it determines the functional performance in tasks that are performed in the same plane of movement. The lack of correlations between flexibility tests and performance in ADL tests is in accordance with previous research (Parks et al., 2003) and confirms the argument of Alqhtani et al. (2015), that if there is not a relationship between ROM tests and functional capacity tests, using the former to explore movement behavior in the latter would lead to erroneous clinical judgments.

On the other hand, the fact that the highest correlations were observed between StP, PtS and SSS provides evidence of their similarity and indicate that they evaluate a similar construct, argument that has been made by Simmonds et al. (1998) when discussing other tests. It should be mentioned that from all tests included, the ones that have been checked regarding their psychometric properties are only SSS (Pfungsten et al., 2014), 5StS, and TUG, while StP and PtS have been drawn from a single study (Bakhtiary et al., 2005). StP was also used by members of this research group in an earlier work (Daskalaki et al., 2024). The very high intercorrelation among StP, PtS and SSS is an indication of construct validity (Denteneer et al., 2018), therefore future research could further control the psychometric properties of these tests. The fact that only StP was related with RMDQ scores may indicate that this test functions differently than the others. On the other hand, as it has been observed by Parks et al. (2003), when discussing the limited correlations between lumbar ROM and functional tests, “the variables that were related showed no predictable pattern, suggesting that this was statistical chance rather than a biologic relation”. In the present research, the fact that only SLRT of the left leg was correlated with SSS was unpredictable and no plausible explanation can be securely provided for this result. Therefore, this correlation, although statistically meaningful, should be further explored in future inquiries.

Our findings combined with the results of other researchers can inform exercise specialists regarding what tests to include when assessing disability. The major finding of the present research was that most of the times there was not a correlation between RMDQ (self-report measure), flexibility and functional tests, being in accordance with some studies (Parks et al., 2003) and in opposition with others (Atya, 2013; Lee et al., 2001). The discrepancy observed between different researchers may be due to different methodological designs (i.e. sample characteristics, tests selected etc.). In all cases, the fact that a similar pattern is not found regarding the correlations of these variables suggests that the results of different studies cannot be generalized to others. Therefore, being in accordance with Lee et al. (2001), our conclusion is that for a more comprehensive understanding of physical function, the assessment of disability in CLBP patients must be multi-modal: self-reports of activity limitation and objective measurement of physical functioning may act in complementarity in order to provide a deeper understanding of the patients’ function. Noting, also, that some correlations were unexpected and might be explained if data on movement patterns were available, it seems useful to suggest that exercise specialists include in their assessments not only quantitative but also qualitative measures to evaluate movement quality during ADLs.

Conclusions

According to the results of the present study, there were strong inter-correlations among flexibility tests and among functional tests which shows that there is a similarity between the correlated tests in the aspect of function that they measure. On the other hand, self-report measures, flexibility and functional tests did not correlate between them most of the times, indicating that they are different constructs that measure different outcomes. Specifically, self-reported disability was not associated with actual performance in most of the cases, being in accordance with some studies and in opposition with others. RMDQ was related to only one of the five functional tests, and this result, when combined with previous findings, does not lead to any definitive conclusion, except that each sample has unique characteristics.

Similarly, flexibility tests were not correlated with functional performance, implying that one cannot substitute for the other when evaluating functional capacity. An exception to that was the correlation of SLRT of the left leg with SSS. This result was unexpected and no plausible explanation can be confidently provided for its causality. It could be maybe hypothesized that unilateral hip ROM was associated with performance due to pain, which may have caused participants to adjust their effort by relying more on one side of their body. However, in lack of observational evaluation during the assessments, this remains only hypothesis. Resuming these results, our conclusion is that for a more comprehensive understanding of physical function, the assessment of disability in CLBP patients must be multi-modal: self-reports of activity limitation and objective measurement of physical functioning may act in complementarity in order to provide a deeper understanding of the patients’ function. Also, noting that some correlations were unexpected and might be explained if data on movement patterns were available, it seems reasonable to suggest that exercise specialists include in their assessments not only quantitative but also qualitative measures to evaluate movement quality during ADLs.

Disclosure statement

No potential conflicts of interest were reported by the authors.

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