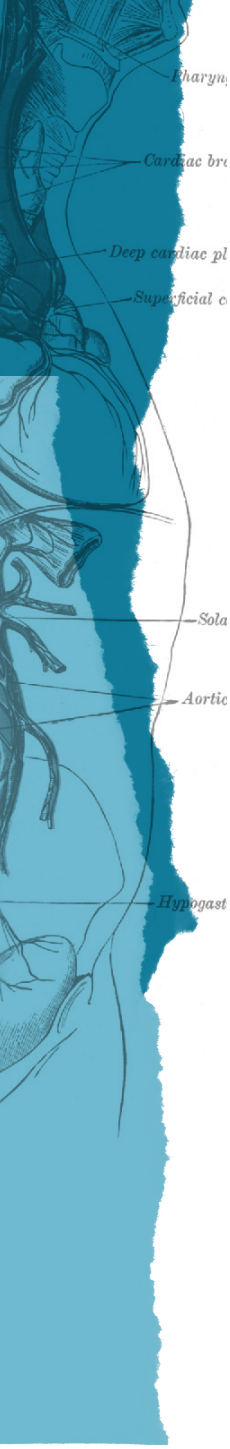

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Clinical Evaluation of Functionality in Fibromyalgia: An Evidence-Based Narrative Review

Evaluación clínica de la funcionalidad en fibromialgia: una revisión narrativa basada en evidencia

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ABSTRACT

Introduction: Fibromyalgia (FM) is a chronic pain syndrome characterized by widespread pain, persistent fatigue, and functional limitations that significantly impact quality of life. Assessing its impact requires the use of valid and reliable tools, although no universally accepted standard currently exists. This study aims to conduct a clinical assessment of functionality in individuals with FM based on the best available evidence.

Method: A narrative review was conducted through comprehensive searches in five major scientific databases: Medline (PubMed), Web of Science, Embase, Scopus, and the Cochrane Library, up to November 2024. Primary and secondary studies published in English evaluating functional tests and outcome surveys applied to individuals with FM were included. Search strategies were designed using MeSH terms and relevant keywords such as "fibromyalgia," "physical function," "functional tests," "outcome measures," and "assessment tools."

Results: Twenty-six functional tests and seven outcome surveys with adequate psychometric properties were identified. Among these, the Six-Minute Walk Test showed the highest validity and reliability, followed by the 30-Second Sit-To-Stand Test. Both tests are useful in clinical and research contexts.

Conclusion: Combining objective and subjective assessments provides a more comprehensive understanding of the functional impact of FM. Using appropriate tools facilitates the design of effective therapeutic interventions and supports treatment monitoring.

Keywords: fibromyalgia, functionality, clinical assessment, functional tests, outcome surveys.

RESUMEN

Introducción: La fibromialgia (FM) es un síndrome de dolor crónico caracterizado por dolor generalizado, fatiga persistente y limitaciones funcionales que afectan significativamente la calidad de vida. La evaluación de su impacto requiere el uso de herramientas válidas y confiables, aunque actualmente no existe un estándar universalmente aceptado. Este estudio tiene como objetivo realizar una evaluación clínica de la funcionalidad en personas con FM basada en la mejor evidencia disponible.

Método: Se realizó una revisión narrativa mediante búsquedas exhaustivas en cinco bases de datos científicas principales: Medline (PubMed), Web of Science, Embase, Scopus y la Biblioteca Cochrane, hasta noviembre de 2024. Se incluyeron estudios primarios y secundarios publicados en inglés que evaluaran pruebas funcionales y encuestas de resultados aplicadas a personas con FM. Las estrategias de búsqueda se diseñaron utilizando términos MeSH y palabras clave relevantes como "fibromialgia", "función física", "pruebas funcionales", "medidas de resultados" y "herramientas de evaluación".

Resultados: Se identificaron veintiséis pruebas funcionales y siete encuestas de resultados con propiedades psicométricas adecuadas. La prueba de caminata de seis minutos mostró la mayor validez y confiabilidad, seguida de la prueba de levantarse y sentarse en 30 segundos. Ambas pruebas son útiles en contextos clínicos y de investigación.

Conclusión: La combinación de evaluaciones objetivas y subjetivas permite una mejor comprensión del impacto funcional de la FM. El uso de herramientas apropiadas facilita el diseño de intervenciones terapéuticas efectivas y respalda el monitoreo del tratamiento.

Palabras clave: fibromialgia, funcionalidad, evaluación clínica, pruebas funcionales, encuestas de resultados.

INTRODUCTION

Fibromyalgia (FM) is a primary chronic pain syndrome recognized by the International Classification of Diseases, 11th Edition (ICD-11) (1,2). Moreover, it primarily manifests as persistent, widespread pain, debilitating fatigue, sleep disturbances, and cognitive impairments, commonly referred to as "fibro-fog," which significantly affects functionality and quality of life (3). The global prevalence of FM ranges from 0.7% to 9.3%, depending on the diagnostic criteria used across different regions (4).

Diagnostic criteria for FM have evolved over the past three decades, causing fluctuations in diagnostic rates due to overestimation, underestimation, and diagnostic errors (5). In addition, FM is often comorbid with other conditions such as depression and anxiety, complicating its identification and management (6,7). Consequently, on average, patients may take up to seven years to receive an accurate diagnosis, with healthcare professionals citing a lack of specialized training as a key barrier to early diagnosis (8).

Clinical management of FM focuses on symptom relief through multidisciplinary strategies, including physical exercise, non-opioid analgesics, antidepressants, and physiotherapy, all of which are supported by moderate- to high-certainty evidence (9). From a functional standpoint, research indicates that FM patients exhibit reduced muscle strength (dynapenia), lower physical performance, and high levels of sedentary behavior (10–12). In this regard, poor physical condition correlates with more severe symptoms, lower quality of life, and an increased prevalence of anxiety-depressive disorders (13).

Currently, there is no universal standard for measuring functionality in individuals with chronic pain, including FM (14). Nevertheless, various validated functional tests and questionnaires serve as valuable tools for assessing functional impact, guiding treatment, and monitoring clinical

outcomes. Accordingly, given the absence of recent systematic reviews, this study aims to describe and summarize evidence-based clinical recommendations for subjective and objective assessments of functionality in individuals with FM.

METHODOLOGY

Initially, a narrative review focusing on clinical assessments of functionality in individuals with FM was conducted. Specifically, electronic searches were performed in five scientifically recognized health-related databases: Medline (PubMed), Web of Science, Embase, Scopus, and the Cochrane Library, covering the period up to November 2024.

Search Strategy: MeSH terms and free-text keywords were used, tailored to each database using Boolean operators (AND, OR) to enhance the sensitivity and precision of the results. In this context, search combinations included:

- "Fibromyalgia"
- "Physical Performance"
- "Outcome Measure"
- "Physical Function"
- "Physical Fitness Tests"
- "Hand Strength"
- "Walk Test"
- "Psychometric Properties"

Furthermore, an iterative search strategy was applied, which also involved reviewing references from selected articles to include additional relevant studies.

Selection Criteria

Inclusion

- Study types: original articles, narrative reviews, and meta-analyses addressing the assessment of functionality in individuals with FM.
- Population: adults diagnosed with FM according to internationally recognized criteria such as those established by the American College of Rheumatology (ACR).
- Interventions and measures: studies exploring functional tests, clinical surveys, and psychometric properties related to physical performance and quality of life.
- Language and period: studies published in English up to November 2024.

Exclusion

- Non-peer-reviewed publications: technical reports, unpublished protocols, conference proceedings, letters to the editor, and brief communications.
- Methodologically limited studies: articles with insufficient information or ambiguous methodologies that did not allow for result replication.

Selection and Analysis Process

Article selection was conducted in three successive phases: (1) title screening, (2) abstract evaluation, and (3) full-text review. Two researchers independently conducted the review, resolving discrepancies through discussion and consensus.

Finally, the analysis was defined as "qualitative and descriptive," synthesizing relevant findings related to the validity, reliability, and applicability of functional tests used to evaluate individuals with FM. In this regard, recommendations for narrative reviews in health sciences were followed to ensure academic rigor and methodological clarity (15,16).

RESULTS

This review identified 26 functional tests and seven outcome surveys with sound psychometric properties. The most robust tools for assessing functionality in FM include the Six-Minute Walk Test (6MWT) and the 30-Second Sit-To-Stand Test (30s-STS).

The findings of this review encompass key aspects of physical performance, muscle strength, balance, and aerobic capacity in individuals with FM, alongside subjective assessments through self-reported questionnaires. Integrating these measurements provides a more precise understanding of the functional impact of FM, helping identify validated tools for clinical and research settings. To facilitate clarity, the main findings are organized by core functional categories below.

Physical and Functional Performance in Individuals with Fibromyalgia

FM patients exhibit significantly lower physical and functional performance compared to healthy individuals. For instance, a systematic review involving 36 studies and 4,078 participants (3,369 FM patients and 709 controls) found that the distance covered during the Six-Minute Walk Test (6MWT) was considerably shorter in FM patients. They also demonstrated slower walking speed, reduced stride length, and lower cadence (17).

Similarly, an increased fall risk was also observed due to poor performance in static and dynamic balance tests, such as the Timed Up and Go test (TUG) and the 3-Meter Backward Walk Test (3MBWT) (18,19).

Grip Strength. Grip strength is a key functional marker in FM patients. In this regard, studies indicate significantly lower grip strength in FM patients compared to healthy individuals (20,21). Additionally, grip strength correlates with the Fibromyalgia Impact Questionnaire (FIQ) score (20) and the Body Mass Index (BMI) (21). Furthermore, a recent study also suggests that grip strength could serve as a simple clinical tool for identifying fall risk and assessing physical health status (22).

30-Second Sit-to-Stand Test. As the ability to sit and stand is a crucial daily activity, it remains a vital focus of assessment. Specifically, a cross-sectional study found that women with FM completed an average of 9.67 repetitions compared to 11.25 repetitions among healthy controls during

the 30-Second Sit-To-Stand Test. Additionally, kinematic analysis revealed longer impulse and rising phases in FM patients (23).

Dual-Task Performance. Concerning dual-task performance, FM patients display reduced physical performance under dual-task conditions, particularly during activities such as stair climbing, elbow flexion, the TUG, and the 3MBWT (18,24–26). Therefore, including cognitive assessments in physical tests is recommended for capturing broader functional limitations.

Subjective Functionality Assessment - Outcome Surveys

Self-reported outcome surveys are widely used tools to measure FM's impact. A 2023 systematic review analyzed 22 studies and identified 16 relevant surveys. Overall, study quality was good, though five studies scored below 5 out of 10 on the COSMIN checklist (27) (Table 1).

Table 1. Outcome surveys assessing functionality in individuals with fibromyalgia.

Acronym	Questionnaire name	Publication Year	N. Items	Subcategories	Completion time (min)	Score range	Cut-off Score	Cost	Structural validity	Cross-Cultural validation	ME	MCID	Reliability
FHAQ	Fibromyalgia Health Assessment Questionnaire	2000	8	Function, global impact	-	0-24	-	-	-	-	-	-	-
FIQ	Fibromyalgia Impact Questionnaire	1991	19	Function, global impact, symptoms	5	0-100	-	-	Yes	Yes	-	-	-
FIQR	Revised Fibromyalgia Impact Questionnaire	2009	21	Function, global impact, symptoms	1.3 (0.02)	0-100	-	Free	Yes	Yes	-	-	-
FIQRS	Revised FIQR with Soreness Assessment Integration	2019	26	Function, global impact, symptoms	-	0-100	-	Free	-	-	-	-	Yes
JAEN	Joint Assessment of Equilibrium and Neuromotor Function	2020	20	Balance and neuromotor function	12-13	0-80	> 22	Free	Yes	Yes	-	-	-
MDF-fibro-17	Multidimensional Daily Diary of Fatigue-Fibromyalgia-17	2017	17	Global fatigue, cognitive fatigue, motivation,	-	0-170	-	Free	Yes	-	-	-	Yes

Continue...

PROMs-FM	Fibromyalgia Patient Reported Outcome Measures Questionnaire	2016	50	Functional disability, quality of life, systemic comorbidities	8.46 (0.25)	-	-	Free	-	-	-	-	Yes

Note. FHAQ: Fibromyalgia Health Assessment Questionnaire; FIQ: Fibromyalgia Impact Questionnaire; FIQR: Revised Fibromyalgia Impact Questionnaire; FIQRS: Revised FIQR with Soreness Assessment Integration; JAEN: Joint Assessment of Equilibrium and Neuromotor Function; MDF-fibro-17: Multidimensional Daily Diary of Fatigue-Fibromyalgia-17; PROMs-FM: Fibromyalgia Patient Reported Outcome Measures Questionnaire; ME: Measurement Error; MCID: Minimal Clinically Important Difference; Min: Minutes.
Source: adapted from Carrasco-Vega et al. (28).

In this regard, the surveys evaluated categories such as functionality, global impact, and symptoms, demonstrating psychometric properties ranging from good to excellent. Due to the heterogeneity of survey structures, selecting those most suitable for specific clinical or research contexts is advised (27).

Additionally, documented discrepancies exist between subjective and objective functional assessments, influenced by factors such as pain catastrophizing; this underscores the need for multimodal evaluations to obtain a more comprehensive functional profile (28).

Objective Functionality Assessment

A 2024 systematic review identified 26 functional tests used to assess physical performance in individuals with FM. These tests were categorized based on evaluated capacities, including aerobic endurance, muscle strength, and balance (29) (Table 2).

Table 2. Functional tests demonstrating validity, reliability, and utility in individuals with fibromyalgia

Physical capacity	Test name	Objective	Materials	Procedure	ICF linking codes	Measurement Error (GRADE)	Smallest Detectable Change	MCID	Dual-task utility	Telemedicine replicability evidence
Aerobic capacity	6-Minute Walk Test	Evaluates integrated exercise stress response of the respiratory, cardiovascular, metabolic, musculoskeletal, and neurosensory systems	Stopwatch, recommended space (≥20m), Borg Scale, Pain VAS	Measures distance walked in 6 minutes. Shorter distances correlate with poorer function and fitness.	Exercise Tolerance (b455), Walking Capacity (d450)	Very low	65.20m	156-167m	-	-
Muscle Strength, Endurance, and Power	Hand Grip Strength	Assesses hand grip strength instrumentally	Hydraulic/ digital hand dynamometer	Patient squeezes the dynamometer for 3 seconds with maximum force, repeated three times per hand, recording the highest score.	Muscle Power (b730)	Low	4.04	-	-	-
	Arm Curl Test	Assesses upper-body strength	Stopwatch, 2.5kg dumbbells	Seated patient performs as many curls as possible in 30 seconds.	Muscle Endurance (b740)	Moderate for single-task, Very low for dual-task	Single-task: 3.16 - 4.96, Dual-task: 5.12	-	Yes	Yes
	30-Second Sit-to-Stand Test	Evaluates lower limb strength	Manual/ automatic stopwatch, chair	Patient performs as many sit-to-stand repetitions as possible in 30 seconds, without using arms.	Muscle Endurance (b740), Exercise Tolerance (b455)	Moderate for single-task, Very low for dual-task	Single-task: 2.14 - 2.69, Dual-task: 3.93	-	Yes	Yes
Balance	Flamingo Balance Test	Evaluates static balance	Stopwatch	Barefoot patient balances on one foot with the opposite knee flexed and held at ankle height with closed eyes. Test ends when form is lost.	Body Position Maintenance (d415)	-	-	-	-	-

Continue...

	Timed Up and Go (TUG)	Assesses mobility, fall risk, dynamic balance	Manual/ automatic stopwatch, chair, cone	Measures time taken to rise from a chair, walk 3m, turn, return, and sit. Best time of two attempts is recorded.	Body Position Change (d410)	Very low for both tasks	0.522 - 1.79	-	Yes	Yes
	8-Foot Up-and-Go Test	Assesses mobility, fall risk, dynamic balance	Manual/ automatic stopwatch, chair, cone	Measures time to rise from a chair, walk 2.44m, turn, return, and sit. Best time of two attempts is recorded.	Body Position Change (d410)	Very low	1.60	-	-	-
	3-Meter Backward Walk Test	Assesses mobility, fall risk, dynamic balance	Manual/ automatic stopwatch, 2 cones	Patient walks 3m backward. Heels align with starting line. Best score from two attempts is recorded.	Body Position Change (d410)	Very low	Single-task: Automatic: 1.49, Manual: 1.06; Dual-task: Automatic: 0.94, Manual: 0.76	-	Yes	-
	L Test	Assesses mobility, fall risk, dynamic balance	Manual/ automatic stopwatch, chair, 2 cones, 20m space	Patient rises, walks 3m to a cone, turns 90°, walks 7m to another cone, turns 180°, and retraces steps to sit again.	Body Position Change (d410)	-	Single-task: Automatic: 1.37, Manual: 1.47; Dual-task: Automatic: 1.86, Manual: 1.77	-	Yes	-

Note. MCID: Minimal Clinically Important Difference; GRADE: Grading of Recommendations Assessment, Development, and Evaluation; ICF: International Classification of Functioning, Disability, and Health; VAS: Visual Analog Scale; m: meters; sec: seconds.
Source: own elaboration.

Aerobic Capacity Tests. Primarily, the 6MWT is a widely validated test for assessing aerobic capacity in FM patients (29). Women with FM cover shorter distances, display reduced cardiorespiratory parameters, and exhibit an altered gait pattern compared to healthy women (30,31).

The distance covered during the 6MWT correlates with FIQ scores, SF-36 Health Survey results, and maximum exercise capacity, making it a clinically relevant and sensitive measure for monitoring change (32).

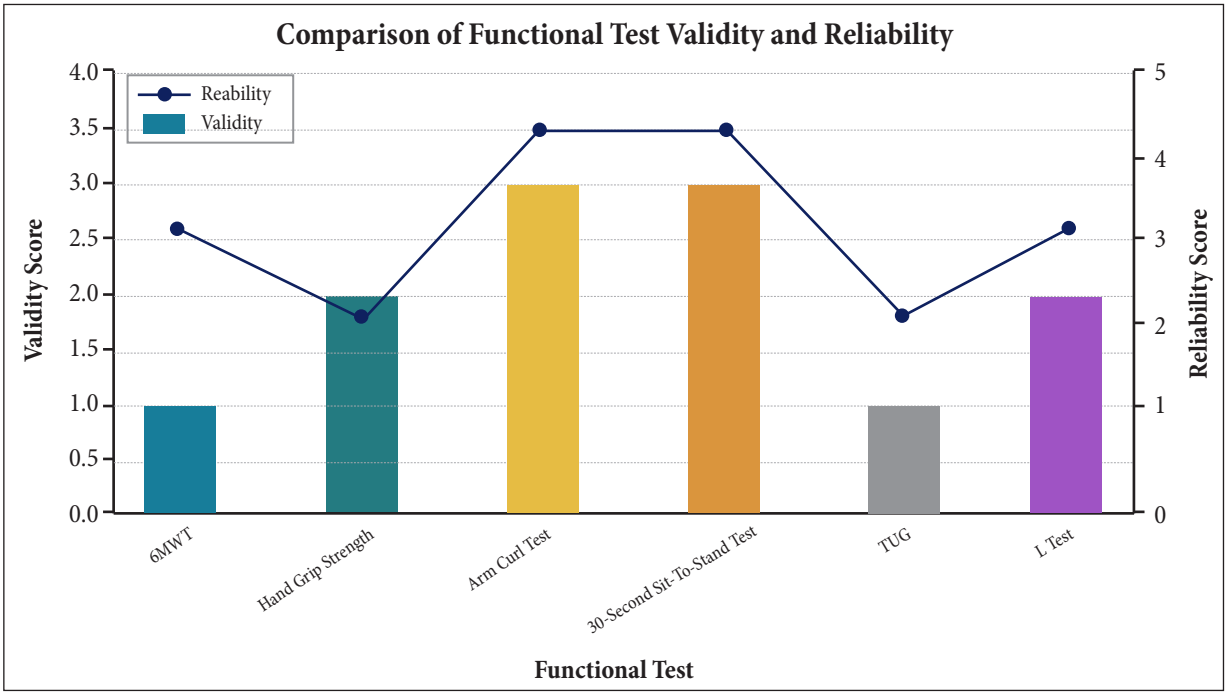
Muscle Strength and Endurance Tests.

Grip Strength Measurement. The assessment of grip strength using hand dynamometry, it is a reliable and feasible method for evaluating muscle strength in FM patients (20,21). Moreover, grip strength values show significant correlations with the Fibromyalgia Impact Questionnaire (FIQ) scores and align with international norms by gender and age, facilitating interpretation in clinical settings (33).

Arm Flexion Test. This test evaluates upper limb endurance by measuring the number of elbow flexions performed in 30 seconds while holding a 2.5-kg weight. Women with FM typically complete fewer than 16 repetitions compared to healthy individuals, demonstrating the test's ability to discriminate between populations (34).

30-Second Sit-to-Stand Test. The 30-Second Sit-To-Stand Test is a validated and reliable measure of lower limb strength in FM patients (35). Women with FM perform significantly fewer repetitions and display prolonged impulse and rising phases during execution (23).

Finally, the following figure illustrates a comparative analysis of the validity and reliability levels for key functional tests utilized in FM patients, including the Six-Minute Walk Test (6MWT), grip strength measurement, arm flexion test, 30-Second Sit-to-Stand Test, Timed Up and Go (TUG), and the L-Test. This figure visually highlights the variability in psychometric properties across these assessments, emphasizing the importance of selecting tests that align with specific clinical and research objectives.



Source: own elaboration.

Figure. Comparison of functional test validity and reliability.

Static and Dynamic Balance Tests

Flamingo Balance Test (Eyes Closed, 30 Seconds). This test assesses static balance in a unipedal stance with eyes closed, demonstrating significantly lower performance among FM patients (36).

Timed Up and Go (TUG). The TUG is a widely validated test for evaluating dynamic balance and functional mobility. In this regard, FM patients show significantly worse results associated with pain and FIQ scores (37).

L-Test of Functional Mobility. This test extends the TUG by incorporating 90° and 180° turns, thereby increasing motor demands and offering a more functional assessment (38,39).

DISCUSSION

The findings of this narrative review emphasize the importance of employing both functional performance tests (FPTs) and self-reported questionnaires to evaluate functionality in individuals with fibromyalgia (FM). In particular, tests such as the Six-Minute Walk Test (6MWT), the Timed Up and Go (TUG), and grip strength measurement have demonstrated moderate to high evidence of reliability and construct validity (29). However, these tests present critical limitations in terms of responsiveness and criterion validity, thereby restricting their clinical applicability and utility in longitudinal research (29). This aligns with previous reviews highlighting the need to improve the precision and sensitivity of these tests for clinical use (34).

Indeed, patients with FM experience significant impairments in muscle strength, aerobic endurance, and balance, which adversely affect their quality of life (11,17,23,30). Recent studies have concluded that both the 6MWT and TUG exhibit good methodological validity, though their criterion validity remains limited, thus affecting their predictive accuracy for clinically relevant outcomes (29). Similarly, Carrasco-Vega et al. (2023) reported heterogeneity in the psychometric properties of questionnaires, particularly regarding application times and standard error measurements (27). These findings are consistent with evidence presented by Berwick et al. (2022), who underscored the need for better standardization in FM functional assessments (3).

Previous research has demonstrated that self-reported questionnaires tend to overestimate symptom severity compared to objective measurements, suggesting the need for combined evaluation approaches. This observation supports the integration of FPTs and self-reported questionnaires for a more comprehensive assessment of patients' functional status (28). Similarly, Latorre-Román et al. (2014) found that combining the 6MWT with questionnaires enhances understanding of patients' functional capacity (32). Furthermore, Fernández-Araque et al. (2020) emphasized the impact of psychosocial factors such as pain catastrophizing, which may skew self-reported outcomes (8).

Therefore, healthcare professionals should prioritize tools with well-established psychometric properties. In this context, applying the International Classification of Functioning (ICF) model could enhance standardization and result comparability, improving evaluation accuracy and supporting the development of more effective treatment guidelines (29). Additionally, Podsiadlo

and Richardson (1991) highlighted the critical role of the TUG as a key measure for assessing functional mobility and fall risk in FM patients (40).

Nevertheless, this study faced several limitations, including its focus on English-language articles and specific databases, which may have excluded relevant research published in other languages. Furthermore, the lack of longitudinal studies and limited criterion validity data constrains the applicability of these findings (29). Similarly, Nugraha et al. (2019) pointed out that the absence of a universal standard in FM functional assessment remains a significant challenge in clinical research (1).

Looking ahead, future research should explore psychometric properties such as criterion validity and responsiveness in FPTs and self-reported questionnaires. Longitudinal studies are also needed to assess functional evolution in FM patients and the impact of specific interventions (29). Along these lines, Fernández-Araque et al. (2020) suggested investigating the relationship between psychological factors and FPT performance to better understand FM-related functional limitations (8). Simultaneously, Morales-Osorio et al. (2024) are currently developing a pain neuroscience educational intervention aimed at improving executive functions and reducing pain intensity in FM patients, highlighting the importance of including cognitive-emotional components in future studies and clinical interventions (41).

Although FPTs and self-reported questionnaires are essential tools for assessing functionality in FM, improvements in their validity and reliability remain necessary. In summary, combining both approaches could optimize clinical practice, guide therapeutic interventions, and advance clinical research (27,29).

Recommendations for Clinical Practice

- Use a combination of objective tests and subjective surveys to assess functionality in FM patients.
- Prioritize tools with well-established psychometric properties.
- Apply the ICF model to enhance standardization.
- Conduct longitudinal studies to assess the evolution of functionality over time.

CONCLUSION

Ultimately, this narrative review emphasizes the importance of using both objective functional tests and self-reported outcome surveys to assess functionality in FM patients. The Six-Minute Walk Test and the 30-Second Sit-To-Stand Test are among the most reliable tools. Consequently, future research should focus on improving the validity and responsiveness of these assessments while incorporating psychological factors into functional evaluations.

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REFERENCES

1. Nugraha B, Gutenbrunner C, Barke A, Karst M, Schiller J, Schäfer P, Falter S, Korwisi B, Rief W, Treede RD; IASP Taskforce for the Classification of Chronic Pain. The IASP classification of chronic pain for ICD-11: functioning properties of chronic pain. Pain. 2019 Jan;160(1):88-94. doi: 10.1097/j.pain.0000000000001433.

2. Smith BH, Fors EA, Korwisi B, Barke A, Cameron P, Colvin L, Richardson C, Rief W, Treede RD; IASP Taskforce for the Classification of Chronic Pain. The IASP classification of chronic pain for ICD-11: applicability in primary care. Pain. 2019 Jan;160(1):83-87. doi: 10.1097/j.pain.0000000000001360.

3. Berwick R, Barker C, Goebel A; guideline development group. The diagnosis of fibromyalgia syndrome. Clin Med (Lond). 2022 Nov;22(6):570-574. doi: 10.7861/clinmed.2022-0402.

4. Li Y, Li Y, Wu S, Long M, Chen X, Wang Y, Zhao J, He B, Chang C, Jiao J. Pharmacologic treatment of fibromyalgia: an update. Frontiers in pharmacology. 2025; 16, 1651181. https://doi.org/10.3389/fphar.2025.1651181

5. Häuser W, Sarzi-Puttini P, Fitzcharles MA. Fibromyalgia syndrome: under-, over- and misdiagnosis. Clin Exp Rheumatol. 2019 Jan-Feb;37 Suppl 116(1):90-97.

6. Briones-Vozmediano E, Vives-Cases C, Ronda-Pérez E, Gil-González D. Patients' and professionals' views on managing fibromyalgia. Pain Res Manag. 2013 Jan-Feb;18(1):19-24. doi: 10.1155/2013/742510

7. Häuser W, Fitzcharles MA. Facts and myths pertaining to fibromyalgia. Dialogues Clin Neurosci. 2018 Mar;20(1):53-62. doi: 10.31887/DCNS.2018.20.1/whauser.

8. Fernandez-Araque A, Gomez-Castro J, Giaquinta-Aranda A, Verde Z, Torres-Ortega C. Mishel's Model of Uncertainty Describing Categories and Subcategories in Fibromyalgia Patients, a Scoping Review. Int J Environ Res Public Health. 2020 May 26;17(11):3756. doi: 10.3390/ijerph17113756.

9. Agarwal A, Emary PC, Gallo L, Oparin Y, Shin SH, Fitzcharles MA, Adachi JD, Cooper MD, Craigie S, Rai A, Wang L, Couban RJ, Busse JW. Physicians' knowledge, attitudes, and practices regarding fibromyalgia: A systematic review and meta-analysis of cross-sectional studies. Medicine (Baltimore). 2024 Aug 2;103(31):e39109. doi: 10.1097/MD.0000000000039109.

10. Kapuczinski A, Soyfoo MS, De Breucker S, Margaux J. Assessment of sarcopenia in patients with fibromyalgia. Rheumatol Int. 2022 Feb;42(2):279-284. doi: 10.1007/s00296-021-04973-6.

11. Tavares LF, Germano Maciel D, Pereira Barros da Silva TY, Brito Vieira WH. Comparison of functional and isokinetic performance between healthy women and women with fibromyalgia. J Bodyw Mov Ther. 2020 Jan;24(1):248-252. doi: 10.1016/j.jbmt.2019.05.024.

12. Vancampfort D, Van Damme T, Albanio Machado V, McGrath RL, Stubbs B, Schuch FB. Levels of sedentary behaviour in people with fibromyalgia: a systematic review and meta-analysis. Disabil Rehabil. 2024 May;46(10):1921-1927. doi: 10.1080/09638288.2023.2214379.

13. Sener U, Ucok K, Ulasli AM, Genc A, Karabacak H, Coban NF, Simsek H, Cevik H. Evaluation of health-related physical fitness parameters and association analysis with depression, anxiety, and quality of life in patients with fibromyalgia. Int J Rheum Dis. 2016 Aug;19(8):763-72. doi: 10.1111/1756-185X.12237.

14. Marques AP, Santo ASDE, Berssaneti AA, Matsutani LA, Yuan SLK. Prevalence of fibromyalgia: literature review update. Rev Bras Reumatol Engl Ed. 2017 Jul-Aug;57(4):356-363. English, Portuguese. doi: 10.1016/j.rbre.2017.01.005.

15. Greenhalgh T. How to Read a Paper: The Basics of Evidence-based Medicine and Healthcare. 6th ed. Wiley-Blackwell; 2019. 288 p. ISBN: 978-1-119-48474-5.

16. Grant MJ, Booth A. A typology of reviews: an analysis of 14 review types and associated methodologies. Health Info Libr J. 2009 Jun;26(2):91-108. doi: 10.1111/j.1471-1842.2009.00848.x

17. Carrasco-Vega E, Ruiz-Muñoz M, Cuesta-Vargas A, Romero-Galisteo RP, González-Sánchez M. Individuals with fibromyalgia have a different gait pattern and a reduced walk functional capacity: a systematic review with meta-analysis. PeerJ. 2022 Mar 21;10:e12908. doi: 10.7717/peerj.12908.

18. Leon-Llamas JL, Villafaina S, Murillo-Garcia A, Domínguez-Muñoz FJ, Gusi N. Test-Retest Reliability and Concurrent Validity of the 3 m Backward Walk Test under Single and Dual-Task Conditions in Women with Fibromyalgia. J Clin Med. 2022 Dec 27;12(1):212. doi: 10.3390/jcm12010212.

19. Collado-Mateo D, Domínguez-Muñoz FJ, Adsuar JC, Merellano-Navarro E, Olivares PR, Gusi N. Reliability of the Timed Up and Go Test in Fibromyalgia. Rehabil Nurs. 2018 Jan/Feb;43(1):35-39. doi: 10.1002/rnj.307.

20. Devrimsel G, Turkyilmaz AK, Beyazal MS, Karkucak M. Assessment of hand function and disability in fibromyalgia. Z Rheumatol. 2019 Nov;78(9):889-893. English. doi: 10.1007/s00393-018-0558-7.

21. Köklü K, Sarigül M, Özişler Z, Şirzai H, Özel S. Handgrip Strength in Fibromyalgia. Arch Rheumatol. 2015 Nov 26;31(2):158-161. doi: 10.5606/ArchRheumatol.2016.5736

22. Cigarán-Méndez M, Úbeda-D'Ocasar E, Arias-Buría JL, Fernández-de-Las-Peñas C, Gallego-Sendarrubias GM, Valera-Calero JA. The hand grip force test as a measure of physical function in women with fibromyalgia. Sci Rep. 2022 Mar 1;12(1):3414. doi: 10.1038/s41598-022-07480-1.

23. Collado-Mateo D, Adsuar JC, Dominguez-Muñoz FJ, Olivares PR, Gusi N. Impact of Fibromyalgia in the Sit-to-Stand-to-Sit Performance Compared With Healthy Controls. PM R. 2017 Jun;9(6):588-595. doi: 10.1016/j.pmrj.2016.10.006.

24. Villafaina S, Collado-Mateo D, Domínguez-Muñoz FJ, Fuentes-García JP, Gusi N. Impact of adding a cognitive task while performing physical fitness tests in women with fibromyalgia: A cross-sectional descriptive study. Medicine (Baltimore). 2018 Dec;97(51):e13791. doi: 10.1097/MD.0000000000013791.

25. Sánchez-Gómez J, Villafaina S, Domínguez-Muñoz FJ, Leon-Llamas JL, Murillo-Garcia A, Gusi N. Comparison between the Impacts of Memory and Arithmetic-Based Dual Tasks on Physical Performance in Women with Fibromyalgia. Biology (Basel). 2022 Jun 21;11(7):947. doi: 10.3390/biology11070947.

26. Villafaina S, Polero P, Collado-Mateo D, Fuentes-García JP, Gusi N. Impact of adding a simultaneous cognitive task in the elbow's range of movement during arm curl test in women with fibromyalgia. Clin Biomech (Bristol). 2019 May;65:110-115. doi: 10.1016/j.clinbiomech.2019.04.006.

27. Carrasco-Vega E, Martínez-Moya M, Barni L, Guiducci S, Nacci F, Gonzalez-Sanchez M. Questionnaires for the subjective evaluation of patients with fibromyalgia: a systematic review. Eur J Phys Rehabil Med. 2023 Jun;59(3):353-363. doi: 10.23736/S1973-9087.23.07762-6.

28. Estévez-López F, Álvarez-Gallardo IC, Segura-Jiménez V, Soriano-Maldonado A, Borges-Cosic M, Pulido-Martos M, Aparicio VA, Carbonell-Baeza A, Delgado-Fernández M, Geenen R. The discordance between subjectively and objectively measured physical function in women with fibromyalgia: association with catastrophizing and self-efficacy cognitions. The al-Ándalus project. Disabil Rehabil. 2018 Feb;40(3):329-337. doi: 10.1080/09638288.2016.1258737.

29. Socorro-Cumplido JL, Chaler J, Almirall M, Sánchez-Raya J, Cano M, Roman-Viñas B. Psychometric properties of performance based tests in patients with Fibromyalgia: A systematic review. J Pain. 2024 Nov 28:104749. doi: 10.1016/j.jpain.2024.104749.

30. Latorre-Román P, Santos-Campos M, Heredia-Jimenez J, Delgado-Fernández M, Soto-Hermoso V. Analysis of the performance of women with fibromyalgia in the six-minute walk test and its relation with health and quality of life. J Sports Med Phys Fitness. 2014 Aug;54(4):511-7.

31. Breda CA, Rodacki ALF, Leite N, Homann D, Goes SM, Stefanello JMF. Physical activity level and physical performance in the 6-minute walk test in women with fibromyalgia. Rev Bras Reumatol. 2013;53(3):276-81.

32. King S, Wessel J, Bhambhani Y, Maikala R, Sholter D, Maksymowych W. Validity and reliability of the 6 minute walk in persons with fibromyalgia. J Rheumatol. octubre de 1999;26(10):2233-7.

33. Tomkinson GR, Lang JJ, Rubín L, McGrath R, Gower B, Boyle T, Klug MG, Mayhew AJ, Blake HT, Ortega FB, Cadenas-Sanchez C, Magnussen CG, Fraser BJ, Kidokoro T, Liu Y, Christensen K, Leong DP; iGRIPS (international handGRIP Strength) group. International norms for adult handgrip strength: A systematic review of data on 2.4 million adults aged 20 to 100+ years from 69 countries and regions. J Sport Health Sci. 2024 Nov 22:101014. doi: 10.1016/j.jshs.2024.101014.

34. Aparicio VA, Segura-Jiménez V, Álvarez-Gallardo IC, Soriano-Maldonado A, Castro-Piñero J, Delgado-Fernández M, Carbonell-Baeza A. Fitness testing in the fibromyalgia diagnosis: the al-Ándalus project. Med Sci Sports Exerc. 2015 Mar;47(3):451-9. doi: 10.1249/MSS.0000000000000445.

35. Martín-Martínez JP, Collado-Mateo D, Domínguez-Muñoz FJ, Villafaina S, Gusi N, Pérez-Gómez J. Reliability of the 30 s Chair Stand Test in Women with Fibromyalgia. Int J Environ Res Public Health. 2019 Jul 2;16(13):2344. doi: 10.3390/ijerph16132344.

36. Aparicio VA, Carbonell-Baeza A, Ruiz JR, Aranda P, Tercedor P, Delgado-Fernández M, Ortega FB. Fitness testing as a discriminative tool for the diagnosis and monitoring of fibromyalgia. Scand J Med Sci Sports. 2013 Aug;23(4):415-23. doi: 10.1111/j.1600-0838.2011.01401.x.

37. Assumpção A, Sauer JF, Mango PC, Pascual Marques A. Physical function interfering with pain and symptoms in fibromyalgia patients. Clin Exp Rheumatol. 2010;28(6 Suppl 63):S57-63.

38. Deathe AB, Miller WC. The L test of functional mobility: measurement properties of a modified version of the timed «up & go» test designed for people with lower-limb amputations. Phys Ther. julio de 2005;85(7):626-35.

39. Leon-Llamas JL, Villafaina S, Murillo-Garcia A, Dominguez-Muñoz FJ, Romero-Dominguez C, Gusi N. "The L test under single and dual-task conditions in women with fibromyalgia: A psychometric study". Journal of Bodywork and Movement Therapies. 1 de octubre de 2024;40:161-7. doi: 10.1016/j.jbmt.2024.03.076

40. Podsiadlo D, Richardson S. The timed "Up & Go": a test of basic functional mobility for frail elderly persons. J Am Geriatr Soc. 1991 Feb;39(2):142-8. doi: 10.1111/j.1532-5415.1991.tb01616.x.

41. Morales-Osorio MA, Ramirez-Velez R, Mejía-Mejía J, Martinez-Martinez LA, Román F, Lopez-Perez PJ, Ordoñez-Mora LT. Efficacy of a pain neuroscience educational program in improving executive function and pain intensity in fibromyalgia patients (Fibrobrain project): Study protocol for a randomized controlled clinical trial. Contemp Clin Trials. 2024;147:107731. doi:10.1016/j.cct.2024.107731