

High Prevalence and Clinical Impact of Fibromyalgia in Functional Motor Disorder

Tereza Serranová, MD, PhD,^{1,*} Lucia Nováková, MD, PhD,¹ Martin Jirásek, MSc,^{1,2} Barbora Křupková, MD,¹ Evžen Růžička, MD, DrSc,¹ Michele Tinazzi, MD, PhD,³ and Tomáš Sieger, PhD,^{1,4}

Abstract: Background: Fibromyalgia is characterized by widespread pain, fatigue, sleep and cognitive symptoms. It overlaps clinically with functional motor disorder (FMD), yet its prevalence and impact in FMD remain uncertain.

Objective: To determine the prevalence of fibromyalgia in FMD using the current criteria and evaluate its effects on motor symptoms and health-related quality of life (HRQoL).

Methods: A total of 138 consecutive FMD patients completed the Fibromyalgia Survey Questionnaire, subjective motor ratings and HRQoL measures. Motor impairment was assessed using the Simplified FMD Rating Scale, and physical/psychiatric comorbidities and medication use were recorded.

Results: Fibromyalgia was present in 44.9% of patients (95% CI: 36.5–53.6%). Those with fibromyalgia had more severe motor symptoms, lower HRQoL and greater medication use. Higher fibromyalgia severity, S-FMDS, and psychiatric comorbidity were independent predictors of lower HRQoL.

Conclusions: Fibromyalgia is common in FMD and associated with worse clinical outcomes, supporting systematic screening and integrated management.

People with FMD frequently experience non-motor symptoms such as pain, fatigue, cognitive and psychological difficulties that substantially affect health-related quality of life (HRQoL).¹ Fibromyalgia, a chronic widespread pain condition affecting 2–3% of the population, manifests with several overlapping symptoms, including fatigue, cognitive issues, sleep problems and headaches.^{2–5} Reflecting the importance of these symptoms, current fibromyalgia criteria no longer rely on tender point examination but instead on self-reported widespread pain and associated symptoms.^{4,6}

A recent systematic review reported a pooled fibromyalgia prevalence of ~10% in functional neurological disorder populations,⁷ higher than in the general population but likely underestimated because fibromyalgia was not systematically assessed. We hypothesized that fibromyalgia prevalence in FMD would be substantially higher and associated with

poorer HRQoL, greater motor severity, multimorbidity, and medication use.

We systematically assessed fibromyalgia prevalence in a consecutive FMD cohort using current diagnostic criteria and examined associations with motor severity, comorbidities, medication use, and HRQoL. We compared characteristics of patients with and without fibromyalgia and examined whether fibromyalgia independently predicts poorer HRQoL.

Methods

Consecutive recruitment was used to minimize selection bias, and all patients fulfilled established diagnostic criteria for clinically definite FMD; patients were recruited between June 27, 2022, and February 23, 2024, from the specialized outpatient service

¹Charles University, 1st Faculty of Medicine and General University Hospital in Prague, Prague, Czechia; ²Charles University, 2nd Faculty of Medicine and University Hospital Motol, Prague, Czechia; ³Department of Neurosciences, Biomedicine and Movement Sciences, University of Verona, Verona, Italy; ⁴Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague, Prague, Czechia

*Correspondence to: Dr. Tereza Serranová, Department of Neurology, 1st Faculty of Medicine and General University Hospital in Prague, Kateřinská 30, Prague, 128 08, Czechia; E-mail: terez.serranova@vfn.cz

Keywords: comorbidity, fibromyalgia, functional neurological disorder, medication, pain.

Funding agencies: This study was supported by the Czech Ministry of Health (NW24-04-00456 and MH CZ–DRO–VF000064165).

This is an open access article under the terms of the [Creative Commons Attribution–NonCommercial–NoDerivs](https://creativecommons.org/licenses/by-nc-nd/4.0/) License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

Received 12 December 2025; revised 10 March 2026; accepted 31 March 2026.

Published online 12 May 2026 in Wiley Online Library ([wileyonlinelibrary.com](https://www.wileyonlinelibrary.com)). DOI: 10.1002/mdc3.70674

for FMD at the General University Hospital in Prague.⁸ Exclusion criteria were age < 18 years, inability to complete questionnaires because of language difficulties, severe learning disabilities or cognitive impairment, major psychiatric comorbidity (eg, psychosis, substance abuse).

The motor phenotypes were classified as functional weakness, tremor, dystonia, myoclonus, gait disorder, or speech disorder. Dominant (most severe and/or most frequent motor symptom) and additional motor phenotypes were recorded, and the number of different phenotypes was used as a proxy measure for motor disorder complexity.

The motor symptom severity was assessed by clinician using the Simplified Functional Movement Disorders Rating Scale (S-FMDRS; range 0–54, higher scores indicate greater severity).⁹ Gait aid score (10 m minimal distance) was evaluated as normal gait = 0, abnormal gait no assistance or walking aids needed = 1, assistance or walking aids needed = 2, wheelchair dependent = 3.³

The 2016 Fibromyalgia Survey Questionnaire was used to assess fibromyalgia based on the 2016 revisions to the 2010/2011 American College of Rheumatology diagnostic criteria.⁶ This validated tool measures the Widespread Pain Index (WPI; range 0–19) and the Symptom Severity Scale (SSS; range 0–12), assessing fatigue, unrefreshing sleep, cognitive symptoms, headaches, abdominal pain/cramps, and depression; together yielding the Fibromyalgia Severity (FS) score. Diagnostic criteria are met with WPI ≥ 7 and SSS ≥ 5, or WPI 4–6 and SSS ≥ 9, plus generalized pain in at least four of five regions for ≥ 3 months. The questionnaire underwent forward and back translation with input from bilingual and subject-matter experts. Clinical assessment including a neurological examination was performed to contextualize symptoms and identify potential comorbidities.^{4,6}

All patients rated their motor symptom severity on a 3-point Likert scale (0 = not bothered, 1 = bothered a little, 2 = bothered a lot) for five symptom categories: weakness, impaired motor coordination, gait disorder, tremor/jerks, and abnormal postures/spasms. A total subjective motor score (range 0–10) was calculated.³

HRQoL was assessed using the 12-Item v2 Short Form Health Survey (SF-12; range 12–44).¹⁰

Neurological and general medical comorbidities were recorded from medical records and clinical assessment (Table S1 and S2). Given the established associations of both FMD and fibromyalgia with migraine (past 6 months) and restless legs syndrome (RLS), participants were systematically assessed using current diagnostic criteria.^{11–14} Psychiatric comorbidity was

documented dichotomously using medical records, a semi-structured clinical interview by the examining neurologist, and self-report using the Beck Depression Inventory (scores > 13 indicating clinically relevant depression symptoms). Centrally acting and nociceptive analgesic use was recorded.

The Fisher's test was used to test independence in contingency tables. Differences between groups in continuous and discrete measures were assessed with Wilcoxon rank tests. Relationships between fibromyalgia symptom severity and motor impairment were examined using Pearson correlations. Differences in fibromyalgia severity across gait aid use were tested with ANOVA. The association between fibromyalgia severity and the number of motor phenotypes was analyzed using Poisson regression. Predictors of HRQoL were identified using a linear regression model incorporating fibromyalgia severity, motor severity, psychiatric comorbidity, multimorbidity, medication use, age, and sex as covariates to jointly explain HRQoL variance. Multiple comparisons within each variable category were corrected using the Holm method.¹⁵

Results

We recruited 161 consecutive patients (131 females, mean age 44.7 [standard deviation, SD = 10.9, 18–72] years; mean disease duration 6.9 [SD 7.3, 0–40]). Because questionnaire data were incomplete in 23 patients, analyses were restricted to 138 patients with FMD (114 females; mean age 44.8 years [SD 11.1, 18–72]; mean disease duration 6.9 years [SD 7.3, 0–40]).

Fibromyalgia was present in 44.9% overall (95% CI 36.5–53.6), including 43.5% of females (95% CI 34.3–53.0) and 50.0% of males (95% CI 29.1–70.9); there was no sex difference ($p = 0.653$).

Patients with fibromyalgia (FM+) and those without (FM–) did not differ in age, sex, age at onset, or disease duration (Table 1). FM+ patients had higher S-FMDRS scores ($p = 0.015$), more frequent gait disturbances ($p = 0.022$), greater reliance on gait aids ($p = 0.022$), and more motor phenotypes ($p = 0.022$). Subjective motor score was also greater in FM+ ($p < 0.001$). FM+ patients had lower HRQoL than FM– patients ($p < 0.001$) (Table 2).

The total number of comorbid physical illnesses and neurological comorbidities, migraine, and RLS frequencies did not differ significantly between FM+ and FM– groups (all $p > 0.05$; Table S1 and S2).

TABLE 1 Demographic and clinical characteristics in FMD patients with and without fibromyalgia

	FMD with FM (n = 62)	FMD without FM (n = 76)	Test statistics	p-value
Sex	50 F, 12 M	64 F, 12 M	Fisher test (n/a)	0.65
Age (years)	44.9 (SD 10.5), range 18–72	44.8 (SD 11.6), range 19–65	$t(136) = -0.050$	0.96
Disease onset (years)	37.0 (SD 12.1), range 7–69	38.6 (SD 10.9), range 14–58	$t(136) = 0.77$	0.44
Disease duration (years)	Median 5 (IQR 7), range 1–34	Median 4 (IQR 5), range 0–40	$W = 1944.5$	0.077

Abbreviations: FM, fibromyalgia; FMD, functional motor disorder; IQR, interquartile range; n/a, not applicable; SD, standard deviation; W, wilcoxon test statistic.

TABLE 2 Health-related quality of life and motor symptom measures in FMD patients with and without fibromyalgia

	FMD with FM (n = 62)	FMD without FM (n = 76)	Test statistics	p-value (corrected)
SF-12 (median [IQR], range)	20 [6], 12–32	24.5 [7], 14–42	$W = 3431$	< 0.001
Main motor phenotype (n)				
Tremor	17	22	Fisher test (n/a)	1
Gait disorder and instability	23	13	Fisher test (n/a)	0.066
Dystonia	7	8	Fisher test (n/a)	1
Weakness	13	31	Fisher test (n/a)	0.084
Myoclonus	2	1	Fisher test (n/a)	1
Speech and swallowing disorder	0	1	Fisher test (n/a)	1
Parkinsonism	0	0	n/a	n/a
Main or additional motor phenotype (n)				
Tremor	38	42	Fisher test (n/a)	1
Gait disorder and instability	49	46	Fisher test (n/a)	0.18
Dystonia	23	20	Fisher test (n/a)	1
Weakness	47	51	Fisher test (n/a)	1
Myoclonus	7	4	Fisher test (n/a)	1
Speech and swallowing disorder	7	9	Fisher test (n/a)	1
Parkinsonism	1	0	Fisher test (n/a)	1
S-FMDS score (median [IQR], range)	14.5 [9], 0–34	10 [13], 0–31	$W = 1679$	0.015
Gait disturbances (%)	77%	55%	Fisher test (n/a)	0.022
Use of gait aids (%)	Wheelchair: 8% Crutch: 26%	Wheelchair: 3%, Crutch: 13%	$W = 2791$	0.022
No. of motor phenotypes (median [IQR], range)	3 [1], (1–6)	2 [1], (1–6)	$W = 1778.5$	0.022
SMSS (median [IQR], range)	7.5 [3], 1–10	5 [4], 0–10	$W = 1228$	< 0.001

Note: Significant results are presented in bold.

Abbreviations: FM, fibromyalgia; FMD, functional motor disorder; HRQoL, health-related quality of life; IQR, interquartile range; n/a, not applicable; S-FMDS, The simplified functional movement disorder rating scale; SF-12, 12-item v2 short form health survey; SMSS, subjective motor symptom severity; W, Wilcoxon test statistic.

FM+ patients used more medications than FM− patients ($p = 0.015$). They more frequently received drugs with some efficacy in fibromyalgia (amitriptyline, cannabinoids, tramadol; $p = 0.015$)¹⁶ and nociceptive analgesics ($p = 0.015$), while no group differences were observed for other drug classes (Table S3).

S-FMDS correlated with FS score ($r = 0.20$, $t(137) = 2.37$, $p = 0.019$). On average, the number of motor phenotypes was greater for higher FS score (Poisson regression $\chi^2(1) = 4.05$, $p = 0.044$). FS score differed across gait aid groups. In those using no gait aids, the mean FS score was 15.0 (1–30), in those using crutches 17.9 (5–31), and in those using a wheelchair 18.3 (16–22) (ANOVA $F(1,136) = 4.8$, $p = 0.029$). There was a strong relation between subjective motor score and FS score both in FM− patients ($r = 0.71$, $t(74) = 8.56$, $p < 0.001$) and in FM+ patients ($r = 0.34$, $t(60) = 2.85$, $p = 0.006$).

SF-12 was negatively associated with FS score ($t(134) = -8.05$, $p < 0.001$), S-FMDS ($t(134) = -3.60$, $p < 0.001$),

and lifelong psychiatric comorbidity ($t(134) = -4.44$, $p < 0.001$) (Table S4). Together, these factors explained 47% of the variance in HRQoL (adjusted $R^2 = 0.47$).

Discussion

This is the first study to apply the 2016 American College of Rheumatology criteria in a well-characterized consecutive FMD cohort and demonstrates a high prevalence of fibromyalgia. Its presence was associated with poorer HRQoL, greater motor symptom severity, and increased medication use.

Fibromyalgia prevalence (44.9%) was over ten times higher than in the general population⁴ and higher than earlier FMD studies reporting 4–16%.^{7,17–21} A recent meta-analysis estimated pooled fibromyalgia prevalence at 10% in FMD, with similar rates across

seizure and motor subtypes.^{7,21} However, previous studies relied on retrospective diagnoses without standardized criteria and systematic assessment,^{7,17–21} likely contributing to under-recognition.²² In contrast, we used a validated self-report questionnaire applying the American College of Rheumatology 2016 criteria cut-offs, which has reported sensitivity of 78.0% and specificity of 90.5% against clinical rheumatologist diagnosis in chronic widespread pain cohorts, suggesting that major overdiagnosis is unlikely.²³

Although fibromyalgia is common across multiple disorders,²⁴ neurological multimorbidity including RLS and migraine did not differ between FMD patients with and without fibromyalgia and was unrelated to fibromyalgia severity, suggesting it is not simply secondary to comorbid medical conditions.

Fibromyalgia in FMD was associated with higher observed and experienced motor symptom severity, greater phenotypic complexity, and greater dependence on mobility aids. No specific motor phenotype was preferentially associated. Fibromyalgia severity correlated with both experienced and observed severity of motor impairment, highlighting the value of systematic screening particularly in patients with more disabling motor symptoms.³ Importantly, fibromyalgia severity independently reduced HRQoL, consistent with the established contribution of pain and other non-motor symptoms to disability in FMD.^{1,7} Similar prevalence in female and male patients suggests that factors beyond sex-related risk may contribute to widespread pain in FMD.

In this study, patients with fibromyalgia used more centrally acting drugs than those without. Although many received agents with evidence in nociplastic pain (eg, tricyclic antidepressants, SNRIs, gabapentinoids, tramadol),¹⁶ most also used nociceptive analgesics (NSAIDs, paracetamol) with little or no efficacy.²⁵ Pharmacological treatments show limited efficacy at the group level; centrally acting agents may benefit a subset of patients, but effect sizes are small, tolerability is often poor, and long-term data are scarce.^{25,26} This study does not allow detailed assessment of medication appropriateness. Under-recognition of nociplastic pain may contribute to repeated investigations and ineffective treatments, yet some patients may still have modifiable focal pain generators requiring evaluation and management.²⁷ Recognition of fibromyalgia or widespread pain in FMD has important management implications. FMD focused rehabilitation alone appears to provide limited benefit for pain,^{7,28,29} whereas physiotherapy combined with cognitive-behavioral interventions may be more effective.³⁰ Identification of fibromyalgia should guide multimodal management aligned with international recommendations, emphasizing non-pharmacological strategies such as pain education, self-management, physical activity, and psychological interventions, while prompting review of medication overuse and avoidance of excessive reliance on analgesics or procedures.^{4,16} Addressing modifiable contributors such as mood, migraine, sleep disturbances, including treatment of RLS and obstructive sleep apnea, represents an important therapeutic target given the bidirectional relationship between sleep and pain.^{13,16,31}

The high prevalence of fibromyalgia in FMD suggests shared mechanisms, as both conditions are increasingly conceptualized as disorders of large-scale brain networks; however, research and explanatory models in the two fields remain largely siloed.^{32,33} In

the functional neurological disorder field, predictive coding models propose a unified framework for functional symptoms across domains, with similar accounts also suggested for pain.^{34,35} In contrast, fibromyalgia literature emphasizes central sensitization within nociplastic pain models, integrating top-down and bottom-up influences on brain network connectivity, alongside immune, neurochemical, and peripheral contributors that remain largely understudied in FND.^{26,27,36,37} Studies examining FM and FMD together may help clarify shared and distinct mechanisms.³⁸

Despite evidence of shared mechanisms, pain and non-motor symptoms in functional neurological disorder remain categorically separated in the current classification systems limiting integration across research and care.^{39,40} The high prevalence of fibromyalgia in FMD further challenges this divide and supports more integrated frameworks. As nomenclature and definitions remain debated, future classification efforts should examine whether diagnosing fibromyalgia is beneficial compared with framing symptoms as chronic widespread pain within FMD or as primary pain disorder (ICD-11).³⁹

This study has several limitations. The convenience sample lacked an a priori power calculation and may have been underpowered for subgroup analyses. The single tertiary-center design and long disease duration may have biased recruitment toward more severe FMD, potentially inflating fibromyalgia prevalence. Psychiatric comorbidities were not assessed with standardized interviews and were likely underestimated. Migraine history and subtypes were not systematically recorded. The subjective motor score is a non-validated composite that may not capture the fluctuating nature of FMD, which may explain its modest correlation with clinician rated severity.

Fibromyalgia was highly prevalent in FMD and was associated with more severe motor symptoms, higher medication use, and lower quality of life. This finding may have implications for the assessment and management of FMD patients with comorbid pain.

Author Roles

(1) Research project: A. Conception, B. Organization, C. Execution; (2) Statistical Analysis: A. Design, B. Execution, C. Review and Critique; (3) Manuscript: A. Writing of the first draft, B. Review and Critique; (4) Funding: A. Obtaining Funding.

T.S.: 1A, 1B, 1C, 2A, 2C, 3A, 3B, 4A.

L.N.: 1A, 1B, 1C.

M.J.: 1C, 2B, 3A.

B.K.: 1C, 2B, 3A.

E.R.: 3A, 3B.

M.T.: 3A, 3B.

T.S.: 2A, 2B, 2C, 3A.

Acknowledgment

Open access publishing facilitated by Univerzita Karlova, as part of the Wiley – CzechELib agreement.

Disclosures

Ethical Compliance Statement: The study was approved by the ethics committee of the General University Hospital in Prague (approval no. 53/23 Grant AZV VES 2024), and all participants gave their written consent to take part in the study. We confirm that we have read the Journal's position on issues involved in ethical publication and affirm that this work is consistent with those guidelines. We used Grammarly and ChatGPT exclusively for English language editing and stylistic refinement. No content was generated, altered, or interpreted by these tools. After using this tool/service, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Funding Sources and Conflict of Interest: The authors declare that there are no conflicts of interest relevant to this work.

Financial Disclosures for the Previous 12 Months: T.S. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, 1st Faculty of Medicine and General University Hospital in Prague, Czech Republic. Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: Ministry of Health of the Czech Republic. Other: None. L.N. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, 1st Faculty of Medicine and General University Hospital in Prague, Czech Republic. Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: Ministry of Health of the Czech Republic. Other: None. M.J. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Department of Rehabilitation and Sports Medicine, Charles University in Prague, 2nd Faculty of Medicine and University Hospital Motol in Prague, Czech Republic. Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: Ministry of Health of the Czech Republic. Other: None. B.K. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, 1st Faculty of Medicine and General University Hospital in Prague, Czech Republic. Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: Ministry of Health of the Czech Republic. Other: None. E.R. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, 1st Faculty of Medicine and General University Hospital in Prague, Czech Republic.

Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: Ministry of Health of the Czech Republic. Other: None. M.T. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Neurosciences, Biomedicine and Movement Sciences, University of Verona, Verona, Italy. Partnerships: None. Contracts: None. Honoraria: personal fees from Abbvie, Bial, Chiesi Farmaceutici, Zambon, and the Movement Disorders Society. Royalties: None. Grants: Italian Ministry of Health, University of Verona, and the Verona Brain Research Foundation. Other: None. T.S. Stock Ownership in medically-related fields: None. Intellectual Property Rights: None. Consultancies: None. Expert Testimony: None. Advisory Boards: None. Employment: Department of Cybernetics, Faculty of Electrical Engineering, Czech Technical University in Prague, Czech Republic and Department of Neurology and Centre of Clinical Neuroscience, Charles University in Prague, 1st Faculty of Medicine and General University Hospital in Prague, Czech Republic. Partnerships: None. Contracts: None. Honoraria: None. Royalties: None. Grants: None. Other: None.

Financial Disclosures and Conflicts of Interest

Author disclosures are available in the Supporting Information.

Data Availability Statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions. ■

References

1. Vechetova G, Slovak M, Kemlink D, et al. The impact of non-motor symptoms on the health-related quality of life in patients with functional movement disorders. *J Psychosom Res* 2018;115:32–37. <https://doi.org/10.1016/j.jpsychores.2018.10.001>.
2. Butler M, Shipston-Sharman O, Seynaeve M, et al. International online survey of 1048 individuals with functional neurological disorder. *Eur J Neurol* 2021;28(11):3591–3602. <https://doi.org/10.1111/ene.15018>.
3. Forejtová Z, Serranová T, Sieger T, et al. The complex syndrome of functional neurological disorder. *Psychol Med* 2023;53(7):3157–3167. <https://doi.org/10.1017/S0033291721005225>.
4. Sarzi-Puttini P, Giorgi V, Marotto D, Atzeni F. Fibromyalgia: an update on clinical characteristics, aetiopathogenesis and treatment. *Nat Rev Rheumatol* 2020;16(11):645–660. <https://doi.org/10.1038/s41584-020-00506-w>.
5. Ducroizet A, Zimianti I, Golder D, et al. Functional neurological disorder: clinical manifestations and comorbidities; an online survey. *Nat Rev Neurosci* 2023;110:116–125. <https://doi.org/10.1016/j.jocn.2023.02.014>.
6. Wolfe F, Clauw DJ, Fitzcharles MA, et al. 2010/2011 fibromyalgia diagnostic criteria. *Semin Arthritis Rheum* 2016; 46(3):319–329. <https://doi.org/10.1016/j.semarthrit.2016.08.012>.
7. Steinruecke M, Mason I, Keen M, McWhirter L, Carson AJ, Stone J, Hoeritzauer I. Pain and functional neurological disorder: a systematic review and meta-analysis. *J Neurol Neurosurg Psychiatry* 2024;95(9):874–885. <https://doi.org/10.1136/jnnp-2023-332810>.

8. Gupta A, Lang AE. Psychogenic movement disorders. *Curr Opin Neurol* 2009;22(4):430–436. <https://doi.org/10.1097/WCO.0b013e32832dc169>.
9. Nielsen G, Ricciardi L, Meppelink AM, Holt K, Teodoro T, Edwards M. A simplified version of the psychogenic movement disorders rating scale: the simplified functional movement disorders rating scale (S-FMDRS). *Mov Disord Clin Pract* 2017;4(5):710–716. <https://doi.org/10.1002/mdc3.12475>.
10. Ware J Jr, Kosinski M, Keller SD. A 12-item short-form health survey: construction of scales and preliminary tests of reliability and validity. *Med Care* 1996;34(3):220–233. <https://doi.org/10.1097/00005650-199603000-00003>.
11. Allen RP, Picchietti DL, Garcia-Borrego D, et al. Restless legs syndrome/Willis-Ekbom disease diagnostic criteria: updated international restless legs syndrome study group (IRLSSG) consensus criteria—history, rationale, description, and significance. *Sleep Med* 2014;15(8):860–873. <https://doi.org/10.1016/j.sleep.2014.03.025>.
12. Stone J, Coebergh J, Khoja L, Butler M, Nicholson TR, Dodick DW. Migraine and functional neurological disorder (FND)—a review of comorbidity and potential overlap. *Brain Commun* 2025;7(4):fcf288. <https://doi.org/10.1093/braincomms/fcaf288>.
13. Serranova T, Slovak M, Kemlink D, Sonka K, Hallett M, Ruzicka E. Prevalence of restless legs syndrome in functional movement disorders: a case-control study from The Czech Republic. *BMJ Open* 2019;9(1):e024236. <https://doi.org/10.1136/bmjopen-2018-024236>.
14. Headache Classification Committee of the International Headache Society (IHS). The international classification of headache disorders, 3rd edition. *Cephalalgia* 2018;38(1):1–211. <https://doi.org/10.1177/0333102417738202>.
15. Holm S. A simple sequentially Rejective multiple test procedure. *Scand J Stat* 1979;6(2):65–70.
16. Macfarlane GJ, Kronisch C, Dean LE, et al. EULAR revised recommendations for the management of fibromyalgia. *Ann Rheum Dis* 2017;76(2):318–328. <https://doi.org/10.1136/annrheumdis-2016-209724>.
17. Tinazzi M, Geroïn C, Marcuzzo E, et al. Functional motor phenotypes: to lump or to split? *J Neurol* 2021;268(12):4737–4743. <https://doi.org/10.1007/s00415-021-10583-w>.
18. Stephen CD, Perez DL, Chibnik LB, Sharma N. Functional dystonia: a case-control study and risk prediction algorithm. *Ann Clin Transl Neurol* 2021;8(4):732–748. <https://doi.org/10.1002/actn.3.51307>.
19. Geroïn C, Stone J, Camozzi S, Demartini B, Gandolfi M, Tinazzi M. Triggers in functional motor disorder: a clinical feature distinct from precipitating factors. *J Neurol* 2022;269(7):3892–3898. <https://doi.org/10.1007/s00415-022-11102-1>.
20. Stone J, Warlow C, Deary I, Sharpe M. Predisposing risk factors for functional limb weakness: a case-control study. *J Neuropsychiatry Clin Neurosci* 2020;32(1):50–57. <https://doi.org/10.1176/appi.neuropsych.19050109>.
21. Matin N, Young SS, Williams B, et al. Neuropsychiatric associations with gender, illness duration, work disability, and motor subtype in a U.S. functional neurological disorders clinic population. *J Neuropsychiatry Clin Neurosci* 2017;29(4):375–382. <https://doi.org/10.1176/appi.neuropsych.16110302>.
22. Hauser W, Sarzi-Putini P, Fitzcharles MA. Fibromyalgia syndrome: under-, over- and misdiagnosis. *Clin Exp Rheumatol* 2019;37(Suppl 116):90–97.
23. Salaffi F, Di Carlo M, Farah S, et al. Diagnosis of fibromyalgia: comparison of the 2011/2016 ACR and AAPT criteria and validation of the modified fibromyalgia assessment status. *Rheumatology (Oxford)* 2020;59(10):3042–3049. <https://doi.org/10.1093/rheumatology/keaa061>.
24. Ramirez-Morales R, Bermudez-Benitez E, Martinez-Martinez LA, Martinez-Lavin M. Clinical overlap between fibromyalgia and myalgic encephalomyelitis. A systematic review and meta-analysis. *Autoimmun Rev* 2022;21(8):103129. <https://doi.org/10.1016/j.autrev.2022.103129>.
25. Giorgi V, Sarzi-Putini P, Pellegrino G, et al. Pharmacological treatment of fibromyalgia syndrome: a practice-based review. *Curr Pain Headache Rep* 2024;28(12):1349–1363. <https://doi.org/10.1007/s11916-024-01277-9>.
26. Mueller BR, Clauw DJ, De Lott LB. Advances in our understanding and treatment of Nociceptive pain. *Neurol Clin* 2025;43(3):549–560. <https://doi.org/10.1016/j.ncl.2025.04.005>.
27. Clauw DJ. From fibrositis to fibromyalgia to nociceptive pain: how rheumatology helped get us here and where do we go from here? *Ann Rheum Dis* 2024;83(11):1421–1427. <https://doi.org/10.1136/ard-2023-225327>.
28. Nielsen G, Stone J, Lee TC, et al. Specialist physiotherapy for functional motor disorder in England and Scotland (Physio4FMD): a pragmatic, multicentre, phase 3 randomised controlled trial. *Lancet Neurol* 2024;23(7):675–686. [https://doi.org/10.1016/s1474-4422\(24\)00135-2](https://doi.org/10.1016/s1474-4422(24)00135-2).
29. Gandolfi M, Riello M, Bellamoli V, Bombieri F, Geroïn C, di Vico IA, Tinazzi M. Motor and non-motor outcomes after a rehabilitation program for patients with functional motor disorders: a prospective, observational cohort study. *NeuroRehabilitation* 2021;48(3):305–314. <https://doi.org/10.3233/NRE-201617>.
30. Macias-Garcia D, Mendez-Del Barrio M, Canal-Rivero M, et al. Combined physiotherapy and cognitive behavioral therapy for functional movement disorders: a randomized clinical trial. *JAMA Neurol* 2024;81(9):966–976. <https://doi.org/10.1001/jamaneurol.2024.2393>.
31. Nepozitek J, Dostalova S, Jirasek M, et al. Sleep in functional motor disorders: a case-control polysomnographic study. *J Sleep Res* 2025;35:e70163. <https://doi.org/10.1111/jsr.70163>.
32. Drane DL, Fani N, Hallett M, Khalsa SS, Perez DL, Roberts NA. A framework for understanding the pathophysiology of functional neurological disorder. *CNS Spectr* 2020;26:1–7. <https://doi.org/10.1017/S1092852920001789>.
33. Pinto AM, Geenen R, Wager TD, et al. Emotion regulation and the salience network: a hypothetical integrative model of fibromyalgia. *Nat Rev Rheumatol* 2023;19(1):44–60. <https://doi.org/10.1038/s41584-022-00873-6>.
34. Kiverstein J, Kirchhoff MD, Thacker M. An embodied predictive processing theory of pain experience. *Rev Philos Psychol* 2022;13(4):973–998. <https://doi.org/10.1007/s13164-022-00616-2>.
35. Edwards MJ, Adams RA, Brown H, Parees I, Friston KJ. A Bayesian account of 'hysteria'. *Brain* 2012;135(Pt 11):3495–3512. <https://doi.org/10.1093/brain/awt129>.
36. Leone CM, Lenoir C, van den Broeke EN. Assessing signs of central sensitization: a critical review of physiological measures in experimentally induced secondary hyperalgesia. *Eur J Pain* 2025;29(3):e4733. <https://doi.org/10.1002/ejp.4733>.
37. Häuser W, Kosek E. Nociceptive pain: facts, controversies and future tasks. *Eur J Pain* 2026;30(1):e70175. <https://doi.org/10.1002/ejp.70175>.
38. Novakova L, Sojka P, Vozenilek D, et al. Prepulse inhibition of the blink reflex in functional neurological disorder and fibromyalgia. *Brain* 2025. <https://doi.org/10.1093/brain/awaf437>.
39. World Health Organization. International Classification of Diseases 11th Revision (ICD-11); 2019.
40. APA. *Diagnostic and Statistical Manual of Mental Disorders*. 5th ed. Arlington, VA: American Psychiatric Publishing; 2013.

Supporting Information

Supporting information may be found in the online version of this article.

Table S1. Frequencies of neurological comorbidities in functional motor disorder (FMD) patients (n = 138)

Table S2. Frequencies of comorbid physical illnesses in functional motor disorder (FMD) patients (n = 138)

Table S3. Medication and comorbidities in FMD patients with and without fibromyalgia. Significant results are presented in bold. FM, fibromyalgia; FMD, functional motor disorder; IQR, interquartile range; n/a, not applicable; NSAIDs, non-steroidal anti-inflammatory drugs; RLS, restless legs syndrome; W, Wilcoxon test statistic.

Table S4. Summary of linear regression models of HRQoL in FMD patients (n = 138).

The full model could be reduced to the simplified one (likelihood ratio test $F(4,130) = 0.82, p = 0.51$). Significant results are presented in bold. FS score, fibromyalgia severity score; S-FMDRS, simplified functional movement disorder rating scale

Data S1. Coi_disclosure_FM_FMD