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Treatment outcomes in functional neurological disorder: a systematic review and meta-analysis exploring the influence of symptom chronicity

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ABSTRACT

Background Functional neurological disorder (FND) is a common cause of neurological disability with symptoms spanning motor, sensory and cognitive domains. While effective treatments exist, the impact of symptom chronicity on treatment outcomes is unclear. This systematic review and meta-analysis investigated whether longer symptom duration influences treatment outcomes across FND phenotypes: functional movement disorders, functional/dissociative seizures (FDS) and mixed presentations.

Methods MEDLINE, Embase, Cochrane Central Register of Controlled Trials, PsycINFO and grey literature were systematically searched till 29 June 2024. Studies were included if they involved adult FND participants undergoing any intervention and evaluated symptom change, function and health-related quality of life (HrQoL). Studies were excluded with <10 participants, missing symptom duration data or irrelevant outcomes. Two reviewers independently extracted data and assessed risk of bias. Meta-analyses used random effects models, subgroup analyses and univariate meta-regression to examine associations with symptom chronicity.

Results 63 studies met inclusion criteria; 27 studies (885 participants) were meta-analysed. Longer symptom duration modestly reduced improvements in motor symptoms (–3.24 points/year, scale: 0–100) and physical HrQoL (–1.2 points/year, scale: 0–100). Global improvements (mean Clinical Global Impression–Change 2.43, 95% CI: 2.28 to 2.59, scale: 1–7) and mental HrQoL gains (mean Short Form–Mental Component Summary +5.04 points, 95% CI: 1.67 to 8.41) were observed irrespective of chronicity. FDS frequency reduced after psychotherapy in eight of nine studies, even with prolonged symptoms.

Conclusions Symptom chronicity modestly reduced motor and physical HrQoL improvements, but did not negate meaningful gains across a range of outcomes. Early diagnosis and treatment are critical for better outcomes, but remain beneficial in chronic stages.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Previous studies, including a systematic review, have explored the prognosis and natural history of functional neurological disorder (FND) and suggest that longer symptom durations carry reduced chances of spontaneous recovery. There is limited research, however, examining how symptom duration moderates treatment outcomes, leaving a gap in understanding of the relationship between symptom chronicity and treatment responsiveness.

WHAT THIS STUDY ADDS

⇒ This study provides the first comprehensive evidence synthesis examining the association between symptom duration and various FND treatment outcomes. Contrary to prevailing assumptions that symptom chronicity impedes recovery from FND, the study describes how patients with longer symptom durations are achieving clinically meaningful benefits across a range of outcomes including symptom severity, physical and social function, and overall health-related quality of life. Prolonged symptom chronicity appears to be associated with modest reductions in improvements in motor symptom severity and physical health-related quality of life in functional movement disorders.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ Early intervention remains important for optimal outcomes, but those with long-standing symptoms should also be offered treatment as they experience significant benefits. This evidence supports a more inclusive approach to managing FND and highlights the need for targeted interventions across the FND disease spectrum and standardised reporting of outcome measures in future FND studies.

INTRODUCTION

Functional neurological disorder (FND) is the second most diagnosed condition in outpatient general neurology clinics, and most frequently diagnosed in hospital neurology consultations between specialties.[1 2] The condition encompasses disorders of movement, sensation and cognition ranging from seizure-like events, paralysis, dystonia, tremor, paraesthesia, blindness to dizziness,[3] which

can profoundly impact the well-being and social participation of afflicted individuals and their caregivers.[4 5]

There has been rapid growth in FND treatments in recent decades. Treatment could involve clinical psychology, physiotherapy or multidisciplinary care, though many other treatments have been described. The efficacy of FND treatments is posited to stem from modifying symptom-focussed attention to return normal 'automatic' function[6] and addressing contributory illness beliefs for maintaining symptom remission.[7]

FND prognosis is highly variable with substantial proportions of people achieving symptomatic remission or improvement after treatment, while a subgroup has refractory symptoms. A systematic review exploring the natural history of the condition based on considerably heterogeneous, small, single-centre studies reported unfavourable prognosis for patients with functional motor weakness without treatment.[8 9] Approximately one-third of untreated FND patients have refractory symptoms at three years.[10] The level of disability and impact on quality of life caused by functional motor symptoms was comparable to people with Parkinson's disease, a progressive neurodegenerative condition.[11] Similarly, a review evaluating the prognosis of dissociative seizures without treatment reported that fewer than four in 10 patients would achieve seizure remission in five years.[12]

Longer symptom duration is often cited as a poor prognostic indicator in untreated individuals with FND.[9 13] A recently published study exploring the biopsychosocial factors influencing FND prognosis contradicted this notion, suggesting no correlation between symptom duration and treatment outcomes based on six studies.[14] Extrapolating from natural history studies that symptom chronicity predicts treatment responsiveness is problematic. In cohorts where chances of spontaneous remission follow normal distribution, symptomatic cohorts are progressively enriched with individuals who have a lower likelihood of spontaneous recovery, as those with greater remission potential would have recovered. Consequently, uncontrolled studies tend to systematically overestimate treatment effects, particularly in patients early in their disease course where spontaneous remission is conflated with treatment responsiveness.

Prognostic information regarding treatment effects is paramount for all of the stakeholders in FND management. For patients and caregivers, this information helps set realistic treatment expectations and encourages engagement with treatment plans.[15] For clinicians, including neurologists, physiotherapists and psychologists, the information can be used to tailor their recommendations based on patient-specific characteristics and preferences for more effective shared decision-making. For policy-makers and healthcare funders, prognostic information could guide resource allocation for FND, translating to service models and care pathways that are more cost-effective, targeted and patient-centred,[16] and reduce the substantial care variations that currently exist.[17]

This systematic review aimed to describe the association between chronicity of functional symptoms and various treatment outcomes across FND phenotypes, a critical and underexplored area with implications for equitable treatment access and service planning.

METHODS

Searches

We systematically searched MEDLINE, Embase, Cochrane Central Register of Controlled Trials and PsycINFO for relevant articles. The references of included studies and narrative articles were screened to identify potentially relevant studies. Conference proceedings were also reviewed. The search strategy is documented in online supplemental file 1. There were no restrictions on language or date of publication. An updated search was performed on 29 June 2024.

STUDY SELECTION

All retrieved articles were deduplicated. Titles and abstracts of potentially eligible articles were screened by two reviewers (STT and ETT) using Rayyan software, after which full texts were reviewed. Disagreements were resolved by consensus. Randomised controlled trials (RCTs) or observational studies were eligible if participants aged ≥16 years received any intervention after diagnosis of a functional disorder, including functional movement disorder (FMD), functional/dissociative seizures (FDS) or mixed presentations (any combination of motor, sensory, seizure or cognitive manifestations). Studies using terms synonymous with FND were included (eg, conversion, psychogenic, dissociative attacks). Interventions could be unimodal or multimodal, ranging from psychotherapy, physical rehabilitation, education, to medical interventions (medication or device therapies). Outcomes of interest were participants' perception of symptoms, change in symptoms (intensity, duration, frequency or complete remission), social and occupational function (eg, return to employment or study) and quality-of-life measures. Exclusions were case reports or small case series (<10 participants), studies lacking symptom duration data or irrelevant participant characteristics and outcomes.

Data extraction and quality assessment

Two reviewers independently extracted data from eligible articles into an Excel form, specifically characteristics of the study (authors, publication date, study site(s) and duration), participants (age, gender, participant numbers, comorbidities, average symptom duration), intervention (setting (eg, inpatient, outpatient, community, or telehealth), type, duration, intensity and clinicians involved), the comparator (if included), and all relevant outcome measures. The risk of bias of all included studies was assessed independently by two reviewers using the Cochrane Risk of Bias Assessment Tool for randomised

trials[18] and the Joanna-Briggs Institute critical appraisal tool for non-randomised studies.[19] On completing each stage, disagreements were resolved by consensus.

Data handling

Several calculations were undertaken to transform original study data and allow pooling of results into meta-analyses. Medians were transformed to means, and SDs were transformed to SEs using formulae outlined in the Cochrane Handbook for Systematic Reviews of Interventions (2023).[20] Mean differences were calculated when they were not provided in the original studies. Where two different scales were combined, results were transformed into a 0–100 scale.

Data synthesis and analysis

Outcome measures of interest included mean differences and standard deviations (change from baseline to postintervention). To ensure sufficient precision and interpretability of pooled estimates, studies were eligible for inclusion in a meta-analysis if >5 studies using sufficiently similar scales contributed quantitative data for a given outcome measure. A random effects model was employed assuming clinical and methodological heterogeneity between studies. Mean scale difference, 95% CIs and study weights were reported. Study weights were calculated using the inverse variance method, which considers variance within studies and heterogeneity across the included studies. Heterogeneity was quantified using the I^2 statistic. Subgroup analyses were performed by intervention type as an expected source of heterogeneity.

To further investigate whether symptom duration moderated change in study scales, univariate random effects meta-regression was performed. The degree in scale change, associated 95% CIs, I^2 statistic addressing residual variation due to heterogeneity and the adjusted R^2 quantifying between-study variance were reported. To visualise this association, bubble plots were generated. Funnel plots assisted in assessing for publication bias when >10 studies were analysed.

Study reporting

This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses 2020 guidance.

Patient and public involvement

None.

RESULTS

Overview of included studies

Our database search identified 2318 potential articles for inclusion, with 25 additional records retrieved through searching grey literature and reference lists. Ultimately, 63 studies met inclusion criteria and contributed to the qualitative syntheses. Of these, 27 studies provided quantitative data using comparable scales which were harmonised for meta-analysis and meta-regression (figure 1). The characteristics of included studies are provided in online supplemental file 2. Data are presented by FND phenotype: FMD, FDS and mixed presentations.

Functional movement disorders

37 FMD intervention studies (12 RCTs[21–32] and 25 observational)[33–57] reported relevant outcomes. Interventions ranged from multidisciplinary rehabilitation programmes, physiotherapy, hypnosis, psychodynamic therapy, antidepressants, botulinum neurotoxin injection to neuromodulation. A summary of individual studies and corresponding outcome measures is provided in online supplemental file 3. Detailed descriptions of all extracted outcome measures are available in online supplemental file 4.

Symptom-related outcomes

Clinical Global Impression–Change Scale

19 studies (including two using a clinician-rated video assessment scale) reported Clinical Global Impression–Change (CGI-C) following treatment. The CGI-C uses a 7-point Likert scale describing the degree of symptom and function change where 1='very much improved' and 7='very much worse'. The pooled mean difference was 2.43 (95% CI: 2.28 to 2.59), indicating that most patients perceived mild to moderate symptom improvement (figure 2).

Motor symptom severity scores

17 studies reported a mean improvement of −14.5 points (95% CI: −18.89 to −10.12) on a 0 to 100 scale standardised across the Psychogenic Movement Disorder Rating Scale and Simplified Functional Movement Disorder Rating Scale. Higher scores represented greater incapacitation and symptom severity. Interventions associated with improvement included inpatient and outpatient multidisciplinary rehabilitation programmes and outpatient psychotherapy. One study suggested transcutaneous electrical stimulation therapy may be beneficial (online supplemental figure S1). Cautious interpretation is advised as a minimum clinically important difference (MCID) has not been defined for these scales along with the substantial study heterogeneity (90.8%).

Other symptom severity scores

Four studies evaluated changes in symptom severity using different, non-validated instruments. The subjective reports of symptom improvement postinterventions limit the interpretability of study results (online supplemental table 1).

1. Physical health and function outcomes: 16 studies assessed physical function across 16 outcome measures, with most studies reporting improvements in balance, fatigue, mobility and functional independence after participating in various FMD rehabilitation programmes (online supplemental table 2). No benefit was perceived on pain.
2. Social function outcomes: 13 studies assessed social and occupational functioning across 9 measures, most

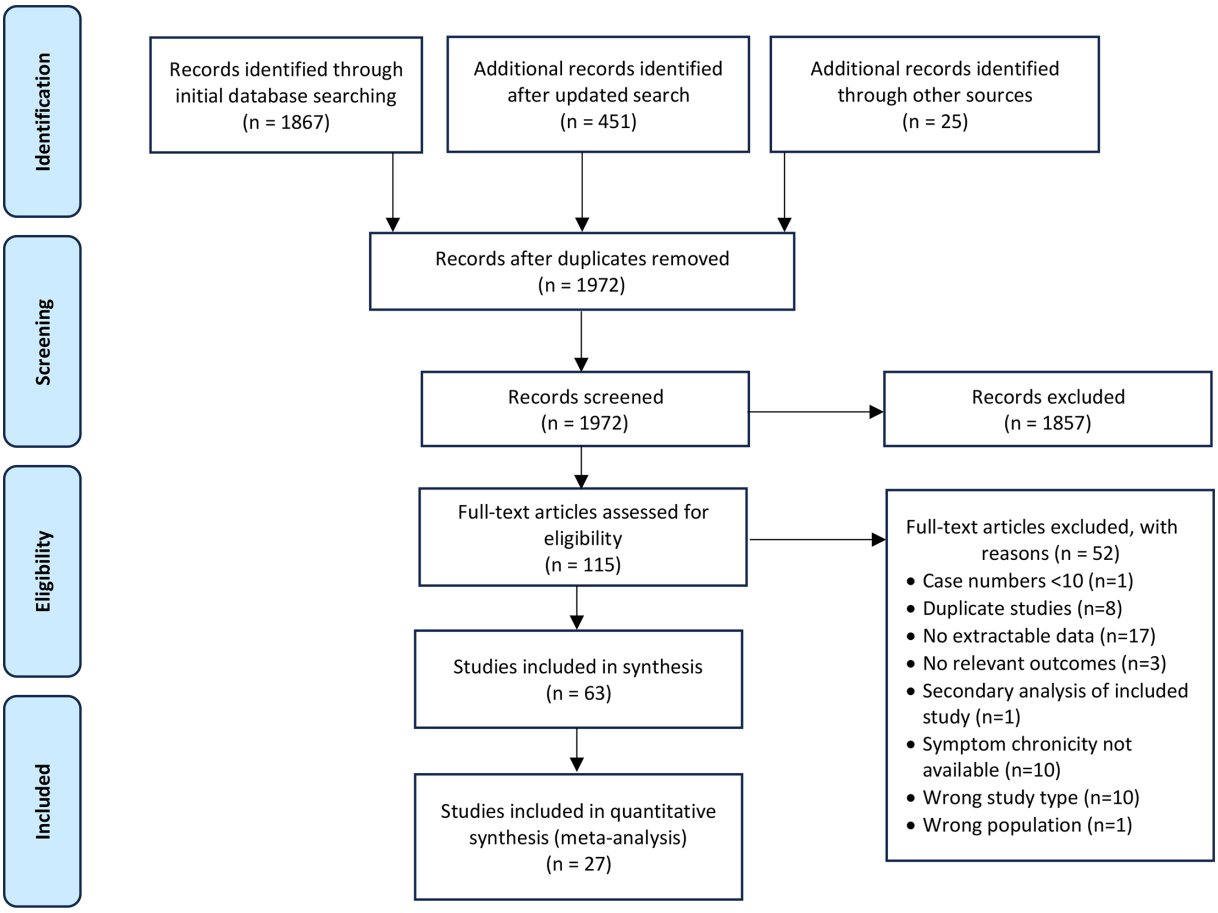


Figure 1 PRISMA flow diagram. PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

commonly the Work and Social Adjustment Scale (WSAS). While several studies showed improvements in daily role performance and psychosocial adjustment, only one of five studies met clinically significant thresholds (online supplemental table 3).[58]

Quality of life

Health-related quality-of-life (HrQoL) was assessed in 11 studies using the Short Form-12 or Short Form-36, which generate separate physical component summary (PCS) and mental component summary scores.

Physical component score

A pooled mean improvement in +6.65 points (95% CI: 4.74 to 8.57) was observed across six studies (online supplemental figure S2). While the MCID threshold in PCS scores has not been validated in an FND population, this improvement would be considered clinically significant in stroke populations.[59]

Mental component score

A mean improvement of +5.04 points (95% CI: 1.67 to 8.41) was seen for patients who had multidisciplinary rehabilitation with(out) psychotherapy (figure 3).

Other quality-of-life measures

Other HrQoL measures like EQ-5D-5L utility score saw meaningful changes exceeding MCID thresholds, though this was limited to single studies with small sample sizes.

Functional/dissociative seizures

22 studies (6 RCTs[58 60–64] and 16 observational studies)[65–80] evaluated treatment outcomes for FDS patients, primarily following psychotherapy-based interventions such as cognitive–behavioural therapy (CBT), mindfulness, psychoeducation or motivational interviewing. The heterogeneity of intervention characteristics and outcome measures limited meta-analytical syntheses. An overview of FDS treatment outcomes is provided in online supplemental file 3.2.

Symptom-related outcomes

Seizure frequency

Seizure frequency was the most frequently reported outcome (online supplemental table 4). Seven out of eight studies found seizure frequency reductions following psychotherapy in cohorts with average symptom durations of 3–10 years. Notably, a high-quality RCT did not show an overall benefit of CBT

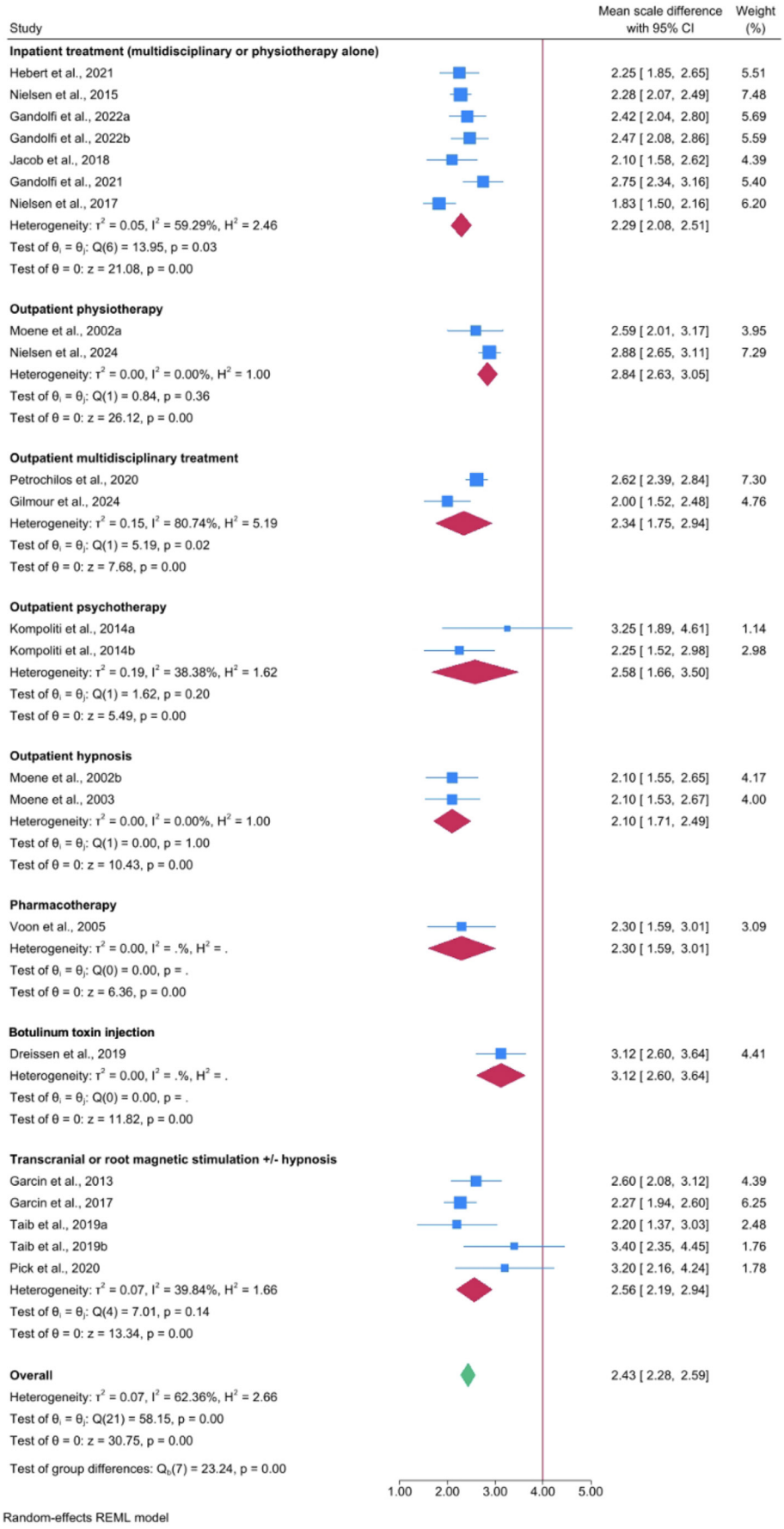


Figure 2 Forest plot with subgroup analyses comparing CGI-C by intervention type. CGI-C, Clinical Global Impression–Change.

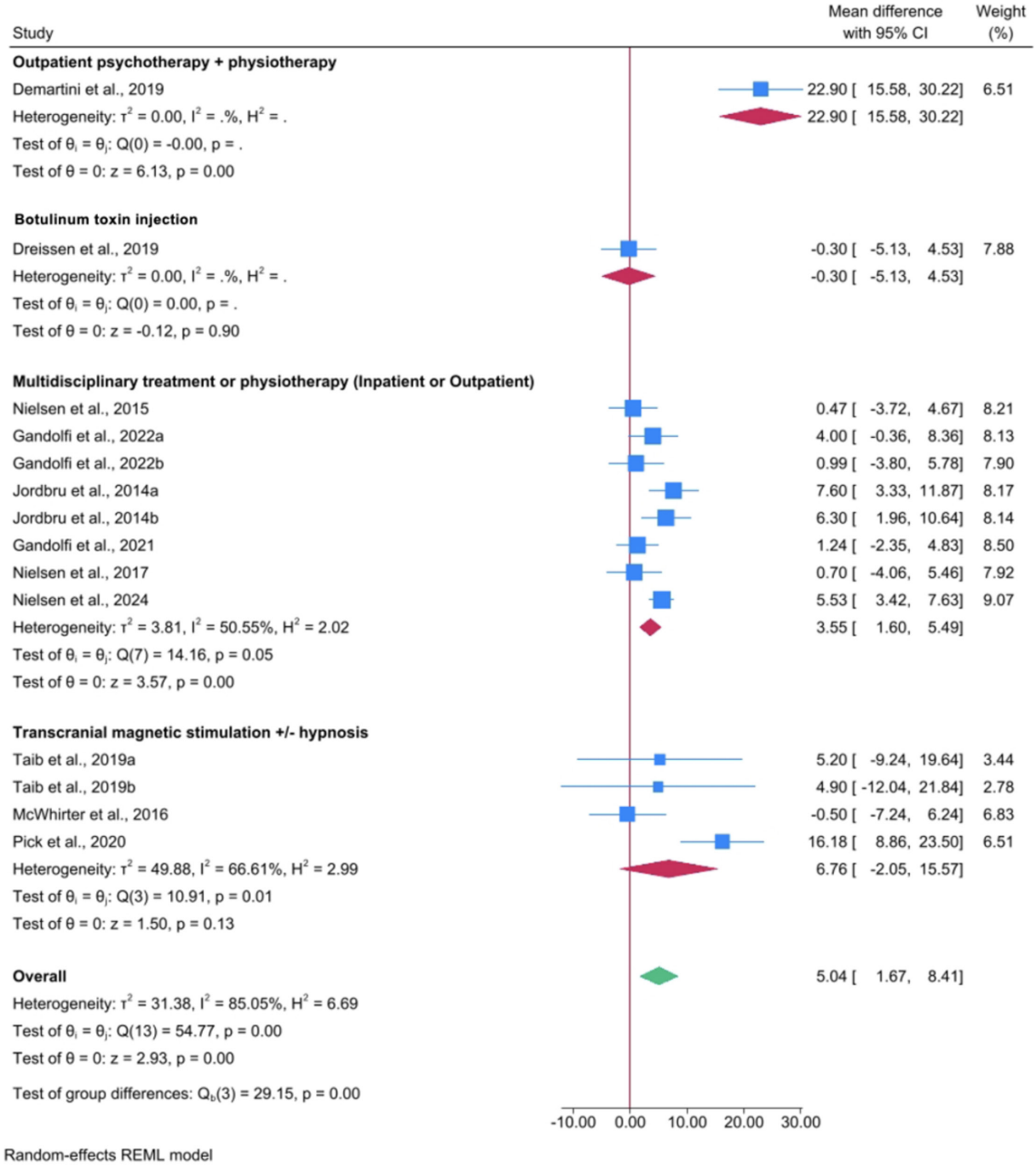


Figure 3 Forest plot with subgroup analyses comparing change in SF-12/ SF-36 MCS scores by intervention type on a standardised scale of 0–100. MCS, mental component summary; SF-12, Short Form-12; SF-36, Short Form-36.

compared with usual care.[60] Figure 4 provides a schematic overview of studies reporting change in seizure frequencies by intervention type and average symptom durations.

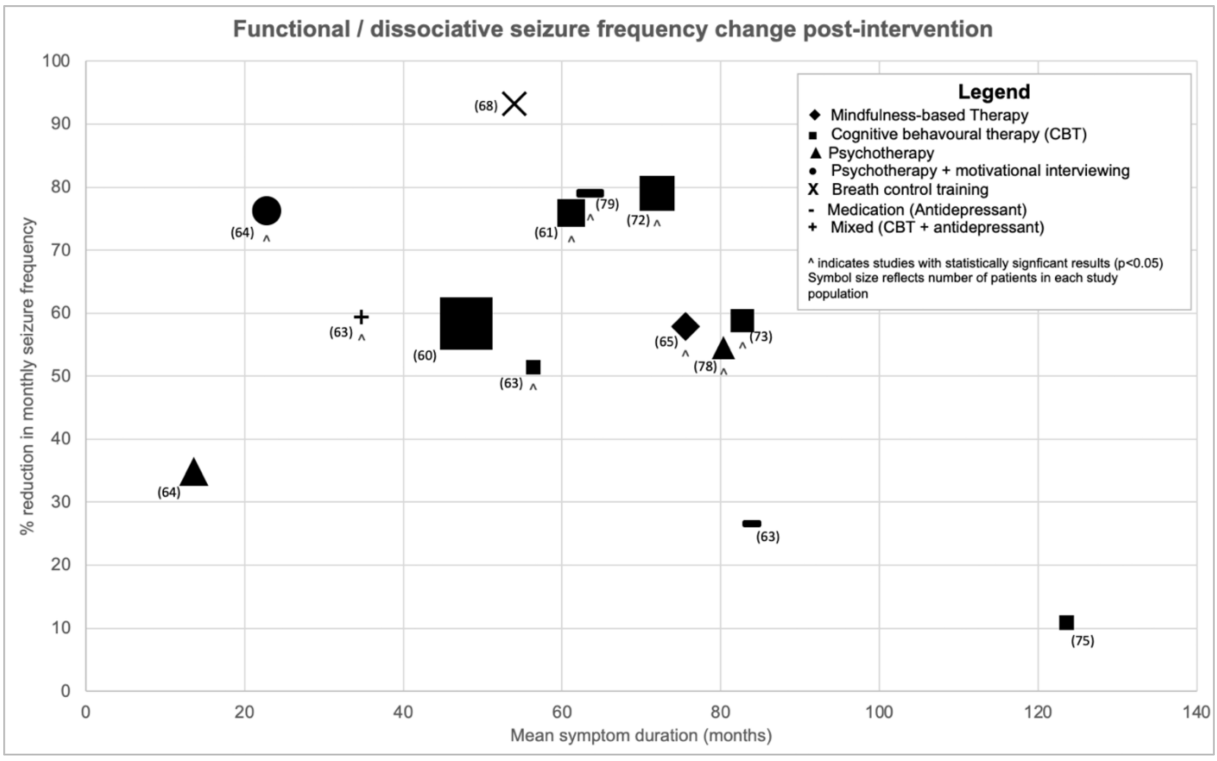
Seizure freedom

Seven studies reported seizure freedom rates after various types of psychotherapy (online supplemental table 5). Seizure remission rates varied between 25% and 45% after intervention with one outlier study reporting 81% seizure remission after prolonged exposure therapy[74] (figure 5). This was achieved in participants with median symptom durations of 4–8 years.

Dissociation-specific Scales

The evidence is mixed on whether psychotherapy improves dissociative symptoms with a small pilot RCT of CBT showing possible benefit (n=9, p<0.001),[63] but other studies reported no change (mean symptom duration 2.8–10.7 years).[62 73 78]

1. Physical function outcomes: Evidence for CBT improving functional independence is inconsistent with a pilot RCT showing CBT may benefit (with or

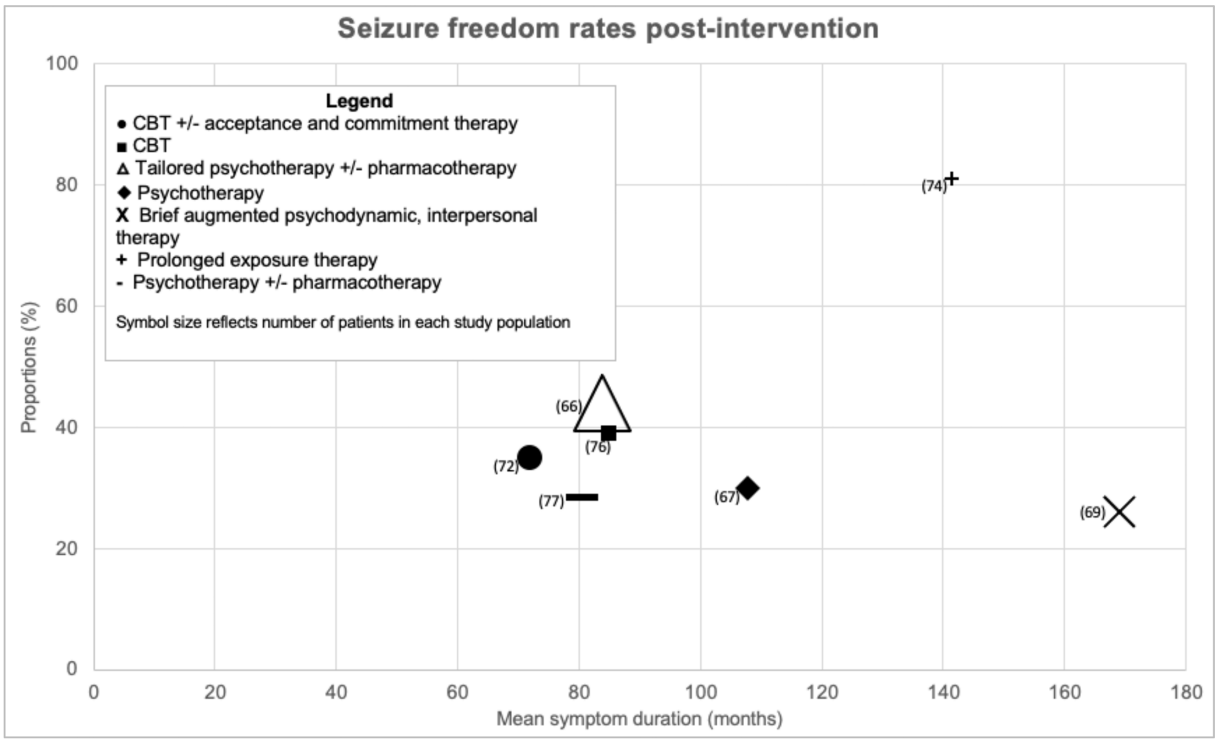


Ref	Study	Intervention type	Mean symptom duration (months)	% reduction in monthly seizure frequency	Statistically significant results (P<0.05)	Number of participants	Data point size
65	Baslet (2020)	Mindfulness-based therapy	75.6	57.87	Yes	26	20
75	Conwill (2014)	Cognitive behavioural therapy	123.6	10.87		10	10
61	Goldstein (2010)	Cognitive behavioural therapy	61.2	75.9	Yes	33	20
60	Goldstein (2020)	Cognitive behavioural therapy	48	58.3		186	36
73	LaFrance (2009)	Cognitive behavioural therapy	82.8	58.7	Yes	21	16
63	LaFrance (2014)	Cognitive behavioural therapy	56.4	51.4	Yes	9	10
72	Deleuran (2019)	Cognitive behavioural therapy	72	79	Yes	42	24
64	Tolchin (2019)	Psychotherapy	13.68	34.8		31	20
78	Kuyk (2008)	Psychotherapy	80.4	54.5	Yes	22	16
64	Tolchin (2019)	Psychotherapy + motivational interviewing	22.8	76.2	Yes	29	20
68	Duncan (2016)	Breathing control training	54	93.2		18	16
79	Pintor (2010)	Medication (Antidepressant)	63.6	79	Yes	19	16
63	LaFrance (2014)	Medication (Antidepressant)	84	26.5		9	10
63	LaFrance (2014)	Mixed (CBT + antidepressant)	34.8	59.3	Yes	10	10

Figure 4 Schematic overview of FDS studies reporting change in seizure frequency preintervention and postintervention. FDS, functional/dissociative seizures.

without sertraline)[63] while an observational study did not.[73] Psychoeducation did not help improve functional status.[71]

2. Social function outcomes: Several studies assessed social and occupational outcomes using WSAS, FAD and LIFE-RIFT. Four studies reported improvements in psychotherapy and psychoeducation with sustained benefits after 6–12 months follow-up in three studies.[58 60 61 76] FND participants had average symptom durations ranging from 1.7 to 8.9 years. Interpretation is limited by high attrition rates, methodological heterogeneity and variability in outcome measures.[71] Isolated studies demonstrated small statistical improvements in general family functioning and social impairment[73] after CBT, but this is not consistently replicated.[63]
3. Quality of life: Six out of nine studies showed improvements in HrQoL after psychotherapy as measured across five outcome measures, including CBT,[60 63 64 73] mindfulness-based therapy[65] and



Ref	Study	Intervention type	Mean symptom duration (months)	% reduction in monthly seizure frequency	Number of participants	Data point size
72	Deleuran et al. (2019)	CBT +/- acceptance and commitment therapy	72	35.0	42	16
76	Cope et al. (2017)	CBT	85.2	39.0	25	10
66	Miersch et al. (2015)	Tailored psychotherapy +/- pharmacotherapy	84	44.0	131	36
67	Santos Nde et al. (2014)	Psychotherapy	108	30.0	37	16
69	Mayor et al. (2010)	Brief augmented psychodynamic, interpersonal therapy	169.2	26.0	47	20
74	Myers et al. (2017)	Prolonged exposure therapy	141.6	81.0	16	10
77	Hovorka et al. (2007)	Psychotherapy +/- pharmacotherapy	80.4	28.6	56	20

Figure 5 Schematic overview of FDS studies reporting seizure freedom rates preintervention and postintervention. CBT, cognitive–behavioural therapy; FDS, functional/dissociative seizures

psychoeducation.[71] Some studies reported sustained benefits at 6 and 12 months follow-up.[60 63 73]

Mixed presentations

Four pre–post studies included participants with mixed FND phenotypes.[81–84] Various psychotherapy and multidisciplinary interventions appeared to improve dissociative symptoms, quality of life and functioning even up to 12 months (online supplemental table 6).

Association between symptom duration and treatment outcomes

The influence of symptom duration was examined using meta-regression analyses across motor and HrQoL domains in FMD, and presented narratively for dissociative seizure studies.

In FMD, longer symptom durations were associated with attenuated improvements in motor symptom severity (–3.24 points per year; p=0.009, figure 6) and physical HrQoL (–1.2 points per year; p=0.002, figure 7). Patient and clinician impression of symptom change (CGI-C, p=0.529) and mental HrQoL (p=0.16) were not moderated by symptom duration, suggesting that perception of benefit and improvements in psychological well-being may remain responsive to treatment even in chronic cases. These findings persisted despite significant heterogeneity in study design and intervention.

For FDS disorder studies, meta-regression was not feasible due to variable reporting. Narratively, however, there was no clear pattern of diminished treatment response with symptom chronicity. Several studies reported reductions in seizure frequency and improved psychosocial functioning in cohorts with symptom durations exceeding 5 years.

In studies involving mixed FND presentations, improvements in symptoms and quality of life were observed, but small sample sizes and study heterogeneity limited a

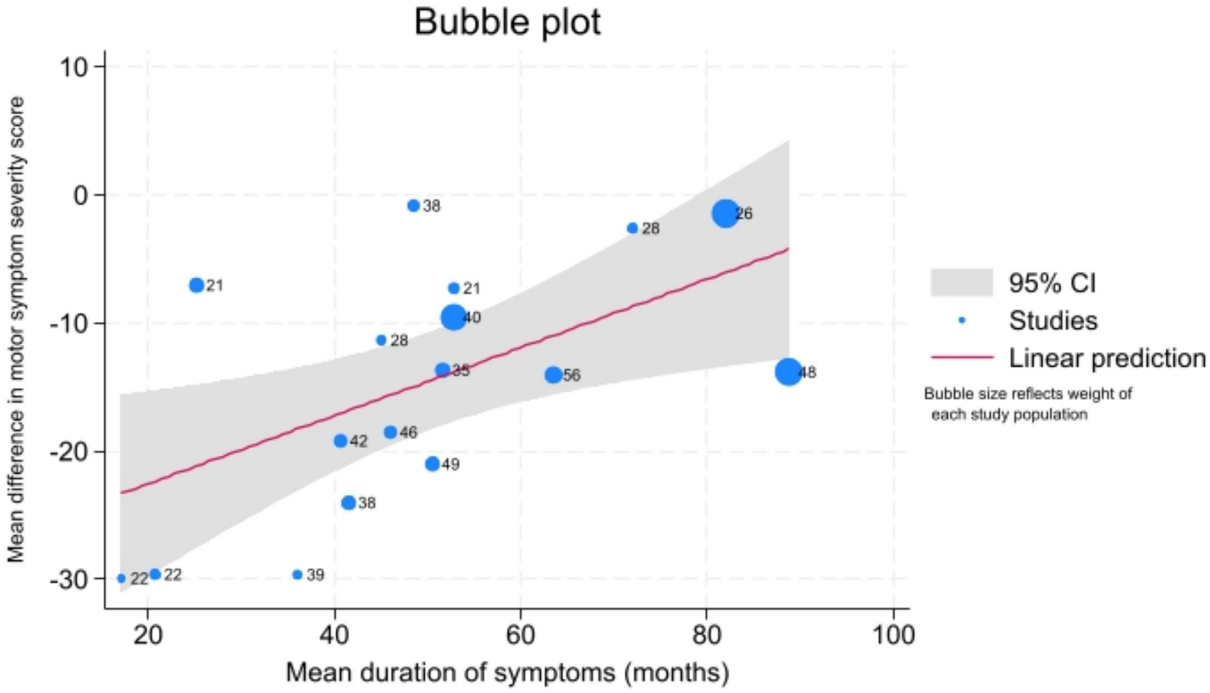


Figure 6 Bubble plot and a mean regression line of change in motor symptom severity scores for FMD patients by mean symptom duration (months). FMD, functional movement disorder.

formal assessment of symptom chronicity effects in this group.

Risk of bias

The quality of studies was varied and limited by the lack of inclusion of control groups with comparable baseline characteristics, consistent follow-up processes and reliable objective and standardised outcome measurements with prevalent blinding issues and recall bias from self-reporting outcomes (online supplemental file 5). Publication bias was deemed likely, favouring studies reporting positive treatment effects across all meta-analysed outcomes (online supplemental figure S3-6).

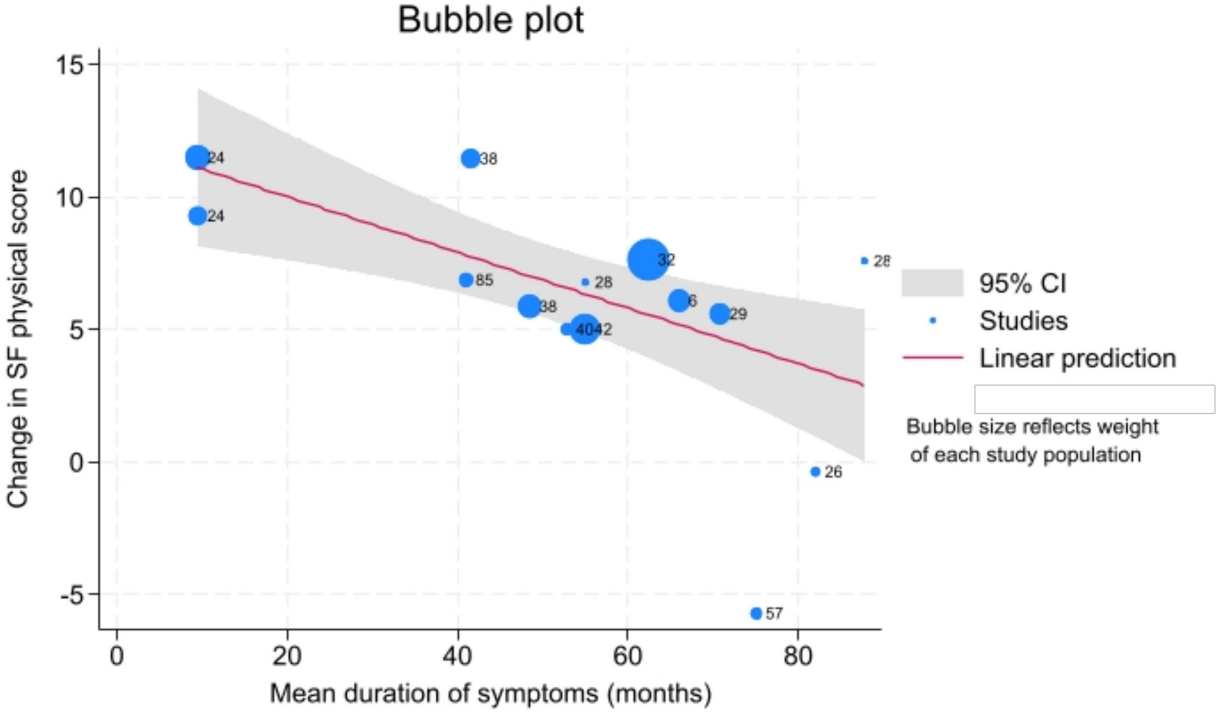


Figure 7 Bubble plot and a mean regression line of change in SF-12/SF-36 physical component scores for FMD patients by mean symptom duration. FMD, functional movement disorder; SF-12, Short Form-12; SF-36, Short Form-36.

Among the 18 RCTs, most were deemed low risk for randomisation but fewer than half clearly concealed allocation. Participant and personnel blinding was often not feasible due to the nature of the intervention (eg,psychotherapy). Outcome assessment blinding was performed in 13 (72%) studies. Only three studies handled incomplete data and attrition appropriately, and most performed per-protocol analyses. Prospective trial registration and protocol adherence was inconsistent in the majority of studies, increasing the risk of selective outcome reporting.

With non-randomised studies, nearly all confirmed disease status at baseline, but control groups were often absent. Of the seven FMD studies with control groups, five had baseline imbalances in participant characteristics which may have biased estimates of intervention effect. Few studies had complete follow-up, accounted for attrition and used intention-to-treat analyses. Reliance on self-reported outcomes and limited use of blinded assessors may have compromised the reliability of outcome measurements. Statistical analyses were generally appropriate, but the lack of standardised, objective outcome measures was a recurring issue.

DISCUSSION

Summary of results

This review found clinically meaningful treatment benefits for patients with functional motor symptoms across all symptom durations and several outcome measures. Symptom duration did not significantly influence perceived treatment benefit (mild to moderate) or mental HrQoL, suggesting that these domains are responsive to intervention. It did, however, exert a modest influence on improvements in motor symptom severity and physical HrQoL. Structured physiotherapy programmes were shown to improve balance and functional mobility. Intervention may also benefit occupational performance and overall social functioning in FMD. Outcome reporting heterogeneity in dissociative seizure treatment studies precluded meta-analysis, underscoring the need for standardised reporting of outcome measures in future FND research.[85] Visual inspection of the results however, does not suggest a clear association between treatment outcome and symptom chronicity. Psychotherapy interventions reduced seizure severity and frequency, with positive impacts on social functioning. HrQoL benefits were modest and sustained.

Strengths and limitations

This systematic review provides a comprehensive summary of FND treatment outcome evidence and is the first to investigate the influence of FND symptom chronicity across a range of patient outcomes. The review included 63 studies, of which 27 studies were incorporated in meta-analyses. This follows an extensive search of FND literature through several databases and broadly including evidence from RCTs to observational studies without applying language or date of publication search restrictions. Subgroup analyses were performed by intervention type and a random effects model was employed to address the expected heterogeneity. Rigorous data handling procedures were followed in transforming data to allow for accurate pooling of results.

This review has several limitations. Study heterogeneity (eg, differences in study designs, FND phenotypes, interventions, settings, durations and outcome measures) as well as with high participant attrition rates and per-protocol analyses could have inflated the treatment effect estimates. The lack of meta-analytical data for functional seizure studies limits confidence in the conclusions for this subgroup. The inclusion of non-randomised studies without control groups or studies with imbalanced participant characteristics across comparator groups could have meant observed improvements reflect non-treatment related factors (e.g., Hawthorne effect). Funnel plot asymmetries also suggest publication bias in favour of studies reporting intervention benefit, which may have resulted in an overestimation of pooled effect sizes.

Blinding of intervention delivery and outcome assessments was not often feasible in a large number of studies. The reliance on self-reported outcomes raises concern for recall and social desirability biases which may have also exaggerated treatment effects. Most included studies were conducted in specialist North American and European centres, restricting the generalisability of symptoms in community settings and non-Western healthcare contexts where FND diagnoses have lower acceptance and fewer treatment resources. Participants with more than 10 years of symptoms are likely underrepresented in intervention trials, leaving the impact of extreme chronicity uncertain in this population. Finally, the lack of long-term data limited our ability to comment on the durability of treatment effects beyond the intervention period. These limitations underscore the need for well-controlled, longitudinal studies which use standardised outcome measures with defined clinical significance thresholds in FND research.

Implications of this review for approaching FND treatment

This review clarifies the influence of symptom chronicity on FND treatment outcomes, with practical implications for clinical care. When counselling patients regarding treatment expectations, clinicians may consider symptom duration when discussing prognosis, but it should not be regarded as determinative of treatment responsiveness. Positive global impressions of change and improvements in mental HrQoL were attainable even in chronic cases, challenging a long-held view that chronic FND patients are inherently treatment-resistant. Gains in motor recovery and physical function were modestly moderated by symptom duration, and clinicians can use this information to frame prognosis in a realistic but hopeful manner.

The findings of this review may have implications for understanding the neurobiological basis of FND. While this is speculative, treatment responsiveness even in chronic cases may reflect an underlying plasticity for

functional reorganisation of networks governing attention, expectation and interoception.[86] Rehabilitative interventions, particularly physiotherapy and CBT, may be recalibrating maladaptive attentional and perceptual processes and encouraging self-agency.[87 88]

These results lead to two complementary conclusions. First, they highlight the urgency of a timely diagnosis and treatment as there is a mild reduction in treatment effectiveness with increasing symptom chronicity. Second, it is encouraging that offering treatment to people with extended symptom durations still yields clinically meaningful improvements across a range of outcomes, cautioning against therapeutic nihilism. There is a need for greater resource and treatment availability to harness the greater likelihood of favourable outcomes earlier in the disease course. The relatively small reduction in treatment effectiveness over time, however, is arguably insufficient to favour treatment of people with symptoms of more recent onset over those with more chronic symptoms. Overall, more treatment is needed, rather than treatment emphasis on select patient subgroups, as many can still benefit from intervention after experiencing symptoms for a long time.

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