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Mixed-methods analysis of formulations in functional neurological disorder

Myles Gutkin [a,b,*], Richard A Kanaan [a], Richard J Brown [c,d]

[a] Department of Psychiatry, The University of Melbourne, Austin Health, Heidelberg, Victoria, Australia
[b] Consultation–Liaison Psychiatry Department, Royal North Shore Hospital, St Leonards, New South Wales, Australia
[c] Division of Psychology and Mental Health, The University of Manchester, Manchester, UK
[d] Greater Manchester Mental Health NHS Foundation Trust, Manchester, UK

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ABSTRACT

Background and objectives: Functional Neurological Disorder (FND) is a relatively common neuropsychiatric condition characterised by disabling or distressing, but potentially reversible, neurological symptoms. There are no well-validated treatments, despite emerging evidence for several psychotherapies. A formulation is a set of explanatory hypotheses answering the question 'why does this patient suffer from this problem at this time?' This study examined the formulations of adults with FND who were treated with Shared Individual Formulation Therapy (SIFT). SIFT uses clinical history-taking and hypothesis-refinement over several sessions to collaboratively formulate how symptoms have emerged in the context of the patient's life experience, to identify relevant vulnerabilities and coping strategies. A shared individual formulation is co-written and verified with each participant to ensure it represents their experience accurately. Our objective was to explore the patterns and associations in these formulations.

Methods: We extracted the formulations from twenty-four letters generated during a prospective, open-label trial of SIFT for FND. Framework analysis was used to identify the key features ('exposures', 'schemas', 'activations' and 'mechanisms') within each formulation. Subgroups identified using hierarchical clustering were compared statistically across characteristics, therapy ratings and outcome scores.

Results: Three clusters were identified. Two were characterised by overvigilance and body focus ($n = 10$), and one was characterised by dissociation and other directedness ($n = 14$). There was some indication of possible differences in treatment response, but numbers were too small to draw firm conclusions.

Conclusion: Findings support the psychological heterogeneity of adults with FND. Analysis of formulations can be used to identify clinically distinct subgroups.

Introduction

Functional Neurological Disorder (FND), also known as conversion disorder, is a relatively common condition characterised by neurological symptoms accompanied by positive diagnostic signs pointing to preserved anatomical function. Although education, psychotherapy and rehabilitation are usually recommended for FND, prognosis is often poor and there is a lack of effective treatment.[1–3] This is likely to be related to the complex pathogenic processes and multiple comorbidities associated with FND, which result in significant heterogeneity.[4,5]

Psychological formulation is the process of generating a series of hypotheses about how and why the patient has the problem in question, and a potentially valuable tool to address the heterogeneity of FND. To formulate, clinicians must be able to recognise relevant processes in the history, examination and clinical relationship. This requires pre-existing knowledge of human motivation, social relations, development and neurophysiology, as well as psychological research and theory about the clinical entities or presenting problems they treat.

Although it has a central place in psychiatry and psychotherapy, formulation is often conducted without the involvement of patients and may only be briefly summarised in assessment documents or undertaken implicitly as part of assessment and treatment planning. In Shared Individual Formulation Therapy (SIFT), the process of formulation is openly shared with the patient throughout the four therapy sessions. This is done in a tentative way that integrates psychoeducation with cognitive-behavioural and psychodynamic concepts and invites the

* Corresponding author at: Department of Academic and Liaison Psychiatry, Royal North Shore Hospital, Level 3, Acute Services Building, Reserve Road, St Leonards, NSW 2065, Australia.
E-mail address: gutkinm@tcd.ie (M. Gutkin).

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patient to consider a range of biological, psychological and social contributors to their condition, as well as contemporary neuropsychiatric research into the causes of disease. SIFT culminates in a formulation letter that is written by the clinician using information provided by the patient; it is then checked by the latter for accuracy and their clarifications, reservations and disagreements are incorporated. This process provides an opportunity to enrich the patient's model of illness without alienating those who do not agree with the clinician's perspective.

The formulation letters generated by SIFT integrate the perspectives of the observer and the subject in a way that may contribute to the understanding of psychological formulation in general, and of the characteristic formulations of the patients they describe, in this case, adults with FND. This study examined the formulation letters of adults with FND who participated in the SIFT Pilot Study in Australia from 2017 to 2019[6] as a step towards describing and codifying the psychological heterogeneity of this group. This study also builds on the published mixed methods analysis of exit interviews from the pilot study,[7] in order to guide the generation of a context-mechanism-outcome theory to guide further evaluation.

Methods

Participants

Twenty-nine adult participants were recruited for the SIFT pilot study, of whom 24 completed all four sessions and received a formulation letter. Eight were male, sixteen were female. Age at recruitment ranged from 19 to 72 years (median 46). All participants provided written, informed consent. Ethical approval was provided by the local Human Research Ethics Committee.

Intervention

SIFT is a four-session outpatient psychotherapy intervention developed to treat FND in adults. It is a hybrid therapy, combining elements of Cognitive Behavioural Therapy (CBT) and Psychodynamic Therapy (PDT) with the shared task of formulating the patient's FND symptoms. The first session involves extended history-taking, after which five concepts are proposed as potentially increasing vulnerability to FND: dissociation; emotion and stress dysregulation; health anxiety and avoidance; illness behaviour; and interpersonal difficulties. These are linked to the participant's history and to here-and-now experiences in the therapy, with a view to increasing their capacity to name and describe important, but often difficult, experiences and emotions, and to expand their disease model to make room for bi-directional influences between mind and body. The final session focuses on co-writing a letter capturing the participant's experience of SIFT, a mutually agreed-upon formulation of the factors that could be contributing to their FND symptoms, and how they might keep working toward recovery.

Data collection

All 24 participants who completed all four sessions of the open-label pilot study of SIFT for FND co-produced a formulation letter along with the therapist (MG). These were deidentified and the formulation components were extracted for analysis. Wherever disagreement by the patient with an aspect of the formulation letter was recorded, that aspect of the formulation was excluded from this study.

Analytic paradigm

We employed Framework Analysis, a mixed inductive-deductive approach using reflexive thematic analysis to generate an analytic framework, which is then used to systematically code the data into a matrix of cases and codes to facilitate comparison within and between cases.[8] Critical realist epistemology was adopted in the interpretation of the data, which combines ontological realism, epistemological relativism and judgemental rationality.[9]

Analytic reflection

The first author and primary coder in this study (MG) is a psychiatrist and psychotherapist who was the chief investigator and therapist in the SIFT Trial who developed the SIFT intervention.

Coding procedure

A single coder (MG) led the development of the analytic framework, supported by regular discussion with co-authors (RB and RK), who verified each iteration of the coding procedure. All coding decisions required justification from tables of codes with supporting quotes and/or published theory and collective approval, with the senior author (RB) having the final decision. This increased theoretical coherence and rigour, while reducing the potential impact of the biases to which MG was prone, given his multiple roles leading the intervention and analysis. This process continued inductively over repeated readings to generate increasingly abstract codes while staying as close as possible to the content of the formulation letters. As the content was abstracted within and between letters, a more deductive approach was gradually used to organise the material, informed by relevant literature and theory.[10–12] The aim was to develop a framework that retained the uniqueness of each individual formulation while identifying similarities and differences between cases using a common system that remained grounded in the data. The coding framework was constructed of categories, each of which was divided into several codes accompanied by definitions to guide systematic coding, with no limit to the number of codes per category within each participant letter. Three worked examples of coding are provided in appendix 1.

Reliability enhancement

Each author independently coded the categories using excerpts made by MG from one randomly selected letter previously unseen by RK and RB. Coding was discussed and used to refine category definitions, then repeated on five new letter excerpts. Inter-rater reliability for the four over-arching categories was excellent ($k = 0.915$) but agreement for individual codes was low at this stage. Further coding refinements were made and four new randomly selected letters (previously unseen by RK and RB) were independently coded. Agreement was excellent for exposures (five items, $k = 0.940$), activations (four items, 0.870) and mechanisms (four items, 0.960) but lower for schemas (five items, 0.750). Further refinement to the schema code definitions were made and three further letters were independently coded for schemas; inter-rater reliability was excellent ($k = 0.888$). With all values of kappa >0.81 ('almost perfect'[13]) the framework was finalised for all subsequent coding.

Cluster analysis and optimisation

Hierarchical cluster analysis was conducted using the Ward D2 method, based solely on the codes generated by systematic application of the final analytic framework to the formulation letters. The elbow, average silhouette, and gap statistic methods were used to guide the selection of the number of clusters, alongside visual inspection of the dendrogram.

Statistical analysis

The characteristics, formulations and triangulation of the clusters were compared using Fisher's exact tests and corrected for multiple comparisons using the Bonferroni correction with the significance threshold (α) set at 0.05.

Triangulation

The interpretation of clusters was also informed by triangulation with intervention ratings by participants, and the Reliable Change Index (RCI) for the primary outcome measure (12-item Short Form Health Survey) at any time point up to 12-months after end of treatment using the method described elsewhere[7]

Results

Data excluded from analysis

Disagreement with an element of the formulation letter was identified in 5 of the 24 participants (21 %). These were recorded and excluded from analysis (Table 1).

Framework construction

The framework captured a general pattern in the letters of events and changes that were experienced as stressful or significant, both proximal and distal to symptom onset, that had potentially contributed to FND symptoms directly or indirectly. This pattern was examined for correspondence with existing psychological theories, and was integrated with the exposures and maladaptive schemas described in schema therapy,[12] combined with the vulnerabilities and mechanisms used in SIFT.[6] A final bespoke analytic framework was generated from the data (Table 2).

Cluster selection

The elbow, silhouette and gap statistic methods were inconclusive in determining an optimal number of clusters. Visual inspection was therefore used to identify the smallest number of distinct 'hills' which maximised difference between, membership within, and interpretability of clusters.[14] Visual and elbow examination of the dendrogram (Fig. 1) suggested that a three-cluster solution (clusters A, B and C) was optimal. Due to small participant numbers in cluster B and the consistency of mechanism across cluster A and B members, these clusters were combined into a single body focus group; all members of this group had body focus as one of the mechanisms underlying their symptoms. We named cluster C the dissociation group, due to dissociation being a mechanism in all cluster C participants. Formulation codes for each participant (Table 3) indicates that overvigilance was a prominent schema in the body focus group, appearing in all but two of the ten participants (one each in clusters A and B). All participants in body-focus cluster B also exhibited schemas of lack of containment and impaired limits, while all participants in body-focus cluster A exhibited disconnection schemas. Further comparisons between clusters A, B and C are provided in appendix 2.

Comparison of clusters

Categorical associations with the body focus and dissociation groups were evaluated using Fisher's exact tests (Table 4). After correction for multiple comparisons, the body focus group had a significantly higher frequency of overvigilance and body focus, while the dissociation group had significantly higher rates of other directedness and dissociation. There were no other significant between-group differences, including in sex, symptom type or treatment outcome.

Table 1
Data excluded from analysis due to disagreement.

Participant	Cluster	Category	Code
P4	C	Mechanism	Help Seeking
P8	C	Schema	Impaired Limits
P13	A	Mechanism	Dissociation
P16	C	Activation	Loss
P26	A	Activation	Relationship Issues

Discussion

This study extracted the formulations from co-written SIFT letters using framework analysis and then used the resulting formulations to organise participants into clusters; these were then analysed for statistical associations with the characteristics and outcomes of members. The framework developed used four categories: significant early life experiences (exposures), characteristic ways of relating to self and other (schemas), adverse events responsible for triggering FND symptoms (activations), and the psychological processes by which symptoms appeared to come about (mechanisms). Although schema therapy was not specifically used to inform or deliver the SIFT intervention, the framework applied schema therapy principles deductively in the exposures and schemas categories, as these overlapped well with the categories that were generated inductively from thematic analysis of the data. This overlap may be due to the common PDT principles underlying both SIFT and schema therapy. The activations and mechanisms categories were derived both inductively from the data and deductively from previous psychotherapy research[11,15] on triggers and how symptoms manifest.

Two distinct groups were identified. One (which consisted of two smaller sub-groups) was characterised by the mechanism of body focus, the other by the mechanism of dissociation. Members of the body focus group were significantly more likely to demonstrate the schema of overvigilance, characterised by emotional inhibition, heightened attention to threats and rigid perfectionism. Other schemas varied in the body focus group, with one sub-group exhibiting impaired limits and a lack of containment and a second exhibiting disconnection. None of these schemas were common in the dissociation group, which was significantly more likely to have the other directedness schema; there was some indication that impaired autonomy schemas and exploitation activations were also more common in the dissociation group, although these did not reach statistical significance. Exposures and activations were otherwise broadly comparable between the groups, albeit with some variations that might have been significant with a larger sample size.

While between-group differences in approval ratings of SIFT were not statistically significant, 63 % (5 of 8 for whom data were available) in the body focus group recommended the intervention, while this proportion was 83 % (10 of 12) in the dissociation group. The lower rate of approval in the body focus group may relate to the association with overvigilance, which might make sharing vulnerable aspects of themselves painful or difficult. In contrast, members of the dissociation group may have found sharing easier and/or have offered higher ratings to please the therapist given the association with other directedness. It may be noteworthy that the dissociation group saw clinically significant improvements in 50 % of participants, while the body focus group saw improvement in only 20 %, suggesting a possible different response to SIFT; this association was not statistically significant but may be a useful focus for future hypothesis-driven research.

Occasional disagreements between patient and therapist over aspects of the formulation were identified, with the relevant codes excluded from the analysis. There was no particular pattern to these disagreements, which encompassed three different categories (mechanism, schema and activation) and five different codes (help-seeking, impaired limits, relationship issues, loss and dissociation). Disagreement were equally common in the dissociation and body focus groups.

Taken together, these findings suggest that there may be differences in how people with FND adapt to early adversity (which may or may not be "trauma" as such) and learn to manage interpersonal and other threats, which then leave them vulnerable to developing FND through distinct mechanisms when exposed to schema-relevant triggers. From a predictive coding perspective, self-focused attention and body checking

Table 2
Analytic framework (modified from Young et al., 2006).

Category 1: **Exposures**
Significant early experiences or deficits impacting participants' view of self and others.
Frustrated attachment
Early environment did not satisfy need for safety, stability, nurturance and acceptance.
Trauma or abuse
Early violent or sexualised experiences imposed across a power differential.
Restricted expression
Early environment significantly limited expression and satisfaction of emotional needs and preferences.
Childhood illness
Prolonged or recurrent illness, impacting age-appropriate tasks and development.
Lack of containment
Lack of supervision or limit-setting impacts age-appropriate self-control and social skills.
Category 2: **Schemas**
Psychological templates that influence responses to events and stress, based on adaptation to early life exposures.
Disconnection
Belief that one was or will be abandoned, harmed or exploited, or is so flawed or different as to be valueless, unlovable, or unable to be part of a community.
Overvigilance
Strong prioritisation of anticipating and rigidly protecting oneself against threats, e.g., negativity and neglect of positives; inhibition of emotion and vulnerability, excessive rationality and perfectionism, rigidity, time focus and intolerance of errors.
Impaired autonomy
Belief one cannot manage, survive or be happy without relying on others (or an individual), or excessive fear of disaster or failure.
Other directedness
Feeling coerced to submit to others to avoid anger, retaliation or abandonment, or excessive focus on meeting the needs or seeking approval from others while neglecting themselves.
Impaired limits
Feeling entitled to special rights, unwilling or unable to tolerate frustration or use self-control.
Category 3: **Activations**
Events prior and proximal to symptoms, hypothesised to precipitate them by activating schemas.
Relationship issues
Conflict, stress or change in major familial, romantic or significant social relationship.
Injury or insult
Accidental injury, intercurrent illness (including psychiatric) or medication side effects.
Loss
Bereavement or loss, including professional, financial or social.
Exploitation
Feeling mistreated, abused or exploited in personal, professional or social relationships.
Category 4: **Mechanisms**
Psychological processes hypothesised to contribute to the onset or maintenance of FND symptoms
Body focus
Attention to the body and a tendency to interpret physiological variation as pathological.
Dissociation
States of feeling abnormally cut off from emotional and physical experience, as in dissociative states.
Help seeking
Symptoms facilitate care and support, or communication of needs.
Escape
Symptoms contribute to escape from, or avoidance of, a distressing situation.

in the body focus group may increase the gain on interoceptive prediction error units, resulting in benign bodily signals being amplified and experienced as symptoms.[16] In the dissociation group, in contrast, a tendency to prioritise the needs of others may leave the person vulnerable to exploitation in the face of interpersonal stressors, with emotional suppression resulting in a dissociated, cut-off state with limited awareness of interoceptive signals that leaves them susceptible to perceptual distortion and FND.[16–18]

The psychological formulations captured in this study were endorsed by the patients. This is significant because formulations are usually written only by clinicians and hence are prone to their assumptions and biases. While the approach used in this study must be interpreted cautiously given the power difference, we believe it may be a valuable approach to confirm the validity and utility of formulation by only including aspects with which the patient agreed, offering more epistemic justice to the patient population. Given the centrality of formulation in the clinical work of a range of mental health professionals, more research into the use and predictive potential of formulation is needed.

Clinical significance

Formulation-based clustering has the advantage of emphasising relevant mechanisms and context, rather than focusing on symptom counts alone, giving it the potential to yield clinically relevant insights. The identified clusters are hypotheses that could be of value for personalising treatment of adults with FND, although the small sample size and non-significant outcome differences caution against immediate clinical application.

These findings contribute to evidence that people with FND are psychologically heterogeneous, and supports the possibility that coherent groups could be identified based on clinical characteristics.[19] Unlike other studies based on clustering psychiatric symptoms and personality traits derived from psychometric tools, clustering in this study was based on reported exposures and hypothesised psychological mechanisms, limiting comparison with previous research. The approach used here may facilitate greater real-world generalisability, particularly in clinical settings where formulation is far more common than psychometric testing, and may even be used as a parallel discourse to psychiatric diagnosis.[20] Whilst the flexibility and subjectivity of formulation may contribute to modest reliability, reliability is increased by supporting hypotheses with evidence[21] such as was done in this

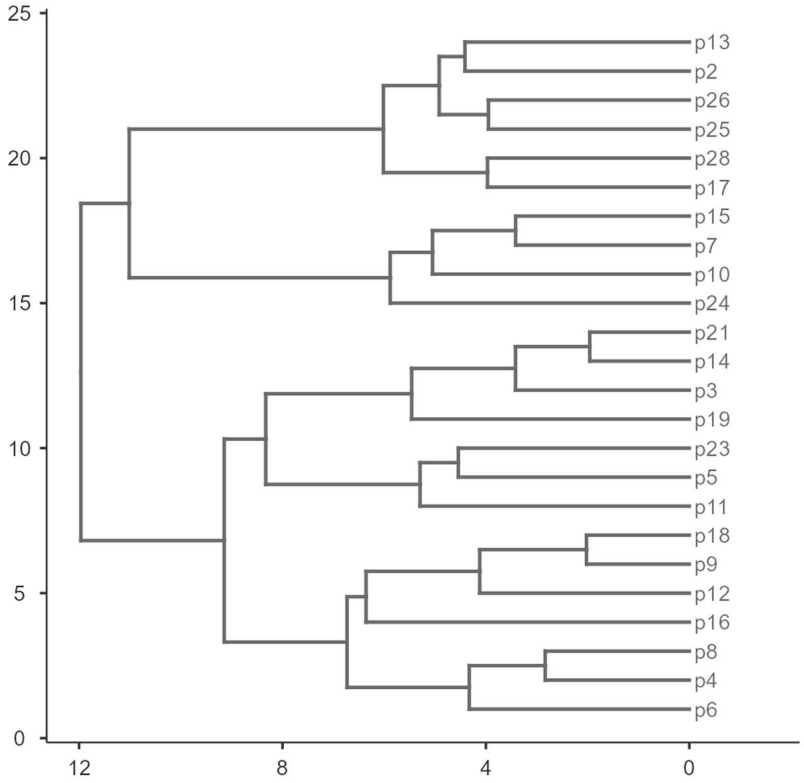

Fig. 1. Hierarchical clustering dendrogram.

study.

The subgroups identified in this study are broadly comparable with those derived from other clustering studies. The body focus group may resemble the subgroups described as reporting lower levels of distress, but for whom symptoms are thought to be a physical manifestation of unrecognised emotional distress, while the dissociation group may resemble those described as reporting higher levels of distress, for whom symptoms are thought to arise from (largely unconscious) attempts to manage emotion and distress.[22] Also similar is a recent study of seizure-type FND that proposed two distinct groups, one with increased bodily attention that may be more prone to non-motile seizures (broadly comparable to the body focus group) and another with greater dissociative symptoms that may be more prone to motile seizures (comparable to the dissociation group).[23]

This study supports the potential relevance of a variety of adverse life experiences to FND and may suggest that the current focus on traumatic experiences may be missing important data.[24] Although not statistically significant between groups, restricted expression was described in the formulation of most members of the body focus group, and trauma or abuse was described by most members of the dissociation group. Adverse exposures that are not experienced as traumatic, such as restricted expression, childhood illness and lack of containment, may contribute to emotional dysregulation in FND.[25] It is significant that many clinicians do not ask about such events, which were considered explicitly in SIFT, using questions derived from the adult attachment interview,[26] such as asking what participants did when hurt physically or emotionally as a child and how carers responded. If the only exposure asked about here had been trauma or abuse, only 13 (54 %) of the 24 participants would have been considered to have relevant adverse life events, compared to the 100 % that was found.

It may be noteworthy that 75 % (6/8) of the participants who contributed to subtheme four ('grappling with the process') in our previous analysis of SIFT exit interviews (conducted prior to, and separately from, the current analysis) were in the body focus group.[7] This theme described how the focus on relationships and emotions in SIFT caused distress, disagreement and disappointment for some participants. In contrast, nearly two-thirds (64 %) of those who contributed to subtheme one, which described SIFT as being helpful for safe exploration of difficult topics, were in the dissociation group. It may be that over-vigilance in the body-focus group contributed to some participants finding the formulation process more difficult, while a rare opportunity to focus on their own needs made this process particularly helpful in the dissociation group. This may suggest that schemas may represent a potential mediator of the mechanism of action of shared formulation.

Methodological significance

This study was based on formulation in a therapeutic relationship. Rather than being self-reported, like the Young Schema Questionnaire,[27] the shared formulation used in this study integrates evidence from sources other than the patient's conscious beliefs about themself. This has advantages in that reported formulations are based on shared exploration of many possible explanatory models which were then synthesised only to the extent that was acceptable to the participant. This increased the likelihood of capturing patterns that were normally outside of awareness, while also ensuring that only those that the patient agreed with were included, increasing their validity. The disadvantages of this approach are that it is harder to replicate and is likely to include post-hoc speculations retrofitted to the outcome. There is no reason to assume that such post-hoc speculation does not occur when completing questionnaires, but in this case, the speculation is explicit and includes both participant and therapist. This may have contributed to the finding of apparently relevant exposures in all cases, where more objective studies have suggested that a small, but notable, proportion of adults with FND report no relevant exposures.[24]

Table 3
Codes and features by participant and cluster.

Characteristics				Exposures					Schemas					Activations				Mechanisms				Results	
Cluster	Participant	Sex	Symptom	Frustrated attachment	Trauma or abuse	Restricted expression	Childhood illness	Lack of containment	Disconnection	Overvigilance	Impaired autonomy	Other directedness	Impaired limits	Relationship issues	Injury or insult	Loss	Exploitation	Body focus	Dissociation	Help seeking	Escape	Recommend SIFT	Improved
A	13	M	Mt																			-	NS
A	2	F	Mt																			-	NS
A	26	M	Mt																			Y	NS
A	25	M	Mt																			Y	NS
A	28	M	Mt																			N	Y
A	17	F	Sz																			Y	NS
B	15	F	Sz																			N	NS
B	7	F	Mt																			Y	Y
B	10	F	Mt																			Y	NS
B	24	M	Mt																			N	NS
C	21	F	Sz																			-	Y
C	14	F	Sz																			Y	Y
C	3	F	Mt																			N	Y
C	19	M	Mt																			Y	Y
C	23	F	Mt																			Y	NS
C	5	F	Sz+																			-	Y
C	11	M	Sz+																			Y	NS
C	18	F	Mt																			Y	NS
C	9	F	Sz+																			Y	Y
C	12	M	Mt																			Y	NS
C	16	F	S																			N	NS
C	8	F	Mt																			Y	Y
C	4	F	Mt																			Y	NS
C	6	F	Sz																			Y	NS

M=male; F=female; Mt=motor; S=sensory; Sz = dissociative seizures; Mt+=motor and dissociative seizures; '-'=no data; Y=yes; N=no; NS=not significant

Research implications

The categories identified in this study have the potential to guide realist evaluation in FND, by examining relevant contextual factors through which the mechanisms of action of any proposed interventions are likely to be mediated.[28] Combined with previously published qualitative and quantitative findings, this allows for the generation of a context-mechanism-outcome model, which should be used to guide further refinement and evaluation of SIFT in adults with FND in line with realist evaluation guidelines.[29]

This is a hypothesis-generating study and the clusters described are exploratory, data-driven psychological subgroups within a SIFT-treated FND sample. As a result, the findings may reflect how SIFT conceptualises FND and not how FND is in general. The clusters need to be replicated with independent therapists, in different cultural and service contexts, and outside of the SIFT structure, before any claims about

Table 4
Comparison between body focus and dissociation groups.

Feature / Code	Body focus (n = 10](%)	Dissociation [n = 14](%)	Fishers Exact (P)	Bonferroni adjusted (P)
Sex	50	21	0.204	1.000
Motor symptoms	80	64	0.653	1.000
Frustrated attachment	50	43	1.000	1.000
Trauma or abuse	40	64	0.408	1.000
Restricted expression	70	57	0.678	1.000
Childhood illness	40	50	0.697	1.000
Lack of containment	40	21	0.393	1.000
Disconnection	60	21	0.092	1.000
Overvigilance	80	21	<0.01*	0.03**
Impaired autonomy	20	64	0.047*	1.000
Other directedness	0	79	<0.01*	<0.01**
Impaired limits	40	27	0.673	1.000
Relationship issues	50	79	0.204	1.000
Injury or insult	60	50	0.697	1.000
Loss	40	21	0.393	1.000
Exploitation	10	50	0.079	1.000
Body focus	100	14	<0.01*	<0.01**
Dissociation	30	100	<0.01*	<0.01**
Help seeking	40	57	0.680	1.000
Escape	40	43	1.000	1.000
Recommend SIFT	63	83	0.347	1.000
Improved	20	50	0.210	1.000

generalisability can be made. The framework could be applied to the formulations of other populations of adults with FND for whom formulations are produced as part of other treatments. This could provide additional data about the interrater reliability, and applicability of the framework to formulations not explicitly based on SIFT. In addition, the resulting codes could be subjected to the same hierarchical clustering analysis, to generate clusters that could be compared to those identified in this study, yielding valuable information about their generalisability or otherwise.

Limitations

Several important limitations apply to this study. The initial explanatory model of FND used to guide the development of SIFT for FND resembles the framework developed in this study, pointing to a degree of circularity in framework development. Indeed, the shared formulation letters were written in the context of the SIFT intervention and analysed by MG, who developed and delivered SIFT as well as the coding framework. As a result, the findings may reflect how SIFT conceptualises FND and not how FND is in general. The verification and sense-checking provided by the co-authors, including the senior author (RB) having the final decision on all coding decisions, is likely to have only partial mitigated the risks of allegiance bias and circular reasoning.

The multiple roles of MG, and the single Australian setting, increase the internal consistency of this study but also limits the generalisability of its findings. This also increases the potential impact of allegiance bias in this study, made greater by the potential power imbalance between therapist and patient.

Potential biases were also introduced by the referral pathway, as all participants were referred by neurologists, who knew that the intervention was psychotherapy leading to potential selection bias due to referring those more willing to engage with psychotherapy. Because this study analysed the co-written letters produced in the final session of SIFT, only those 24 of 29 participants who completed all four sessions were included, which may have introduced survivorship bias.

Conclusions

This study supports the potential of mixed methods analysis of formulations to identify clinically relevant patterns within and between adults with FND.

Statement of ethics

This study was approved by the Northern Sydney Local Health District Human Research Ethics Committee, approval number HREC/17/HAWKE/141. All procedures contributing to this work complied with all relevant laws and institutional guidelines and with the Helsinki Declaration of 1975, as revised in 2008.

Informed consent

Written informed consent was obtained from participants to participate in the study.

Trial registration

The trial was registered with the Australian New Zealand Clinical Trial Registry, number ACTRN12618000181202.

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Data availability statement

Research data are not publicly available on ethical grounds.

CRediT authorship contribution statement

Myles Gutkin: Conceptualization, Methodology, Investigation, Formal analysis, Writing – original draft. **Richard A Kanaan:** Conceptualization, Methodology, Validation, Writing – review & editing. **Richard J Brown:** Conceptualization, Methodology, Validation, Writing – review & editing.

Declaration of competing interest

The authors have no conflicts of interest to declare.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.ejpsy.2026.100348.

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