What is known about the rehabilitation management of Functional Neurological Disorder in the adult physical hospital setting: A scoping review.

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A Project submitted in partial fulfilment of the degree Master of Occupational Therapy at Otago Polytechnic, Dunedin, New Zealand

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Declaration concerning Research Project presented for the degree of Master of Occupational Therapy

I, Sonya Maree Wilson

Solemnly and sincerely declare, in relation to the Research Project entitled:

"What is known about the rehabilitation management of Functional Neurological Disorder in the adult physical hospital setting: A scoping review."

a. that the work was done by me personally

and

b. that the material has not previously been accepted in whole, or in part, for any other degree or diploma

Signature: Sonya Maree Wilson

Date: 13th May 2022

Abstract:

Background:

Functional Neurological Disorder (FND), historically known as Conversion Disorder, is a condition that lies at the intersection of physical health, mental health, and neurology as the symptoms of this condition affect the body, but the underlying cause is non-organic in nature. The reconceptualization of FND from being considered a purely psychiatric disorder has led to a period of evolution in the way this disorder is managed within the hospital setting in recent years.

Objective:

This scoping review examined the research surrounding the hospital-based management of FND after the diagnosis had been made. The aim was to explore the body of evidence surrounding this topic and draw on the many disciplines that make up the team working with this cohort of people within the hospital setting.

Methodology:

Guided by the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis and the Preferred Reporting Items for Systematic Reviews extension for Scoping Reviews (PRIMSA-ScR) a thorough search of the literature was completed and ultimately selected 16 articles for inclusion in this review.

Findings:

A descriptive summary of the literature was made using a charting table, detailing the included studies characteristics, from which four themes were identified and explored: Positive communication; Charting the person's journey; Creating an enabling environment and Promoting recovery.

Conclusion:

Findings from the review pointed towards the importance of having a cohesive and unified vision for the in-patient team working with a person with FND, with positive communication being identified as a key element. Areas of further research have been identified including the need to have a greater understanding of the person with FND's journey in the hospital setting, as perception is a key element of the FND experience.

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Introduction:

Functional Neurological Disorder (FND), historically known as Conversion Disorder (CD), is a condition that lies at the intersection of physical health, mental health and neurology as the symptoms of this condition affect the body, but the underlying cause is non-organic in nature (Gardiner et al., 2018; O'Neal & Baslet, 2018). People with FND often present to the Emergency Department (ED) with pronounced physical symptoms like abnormal motor movements, collapses, altered sensation and speech and swallow changes that are inconsistent with any recognised neurological condition (Klinke et al., 2019; Stone & Carson, 2011).

Historical Views of Functional Neurological Disorder/Conversion Disorder:

The diagnosis of CD has been present in some form through the ages, initially being described as 'hysteria', however it began to take its current shape in the 19th century, and was placed solely in the psychiatric domain with Dr Sigmund Freud working to develop the concept and term 'Conversion Disorder' in the 1800's (Cretton et al., 2020). CD finally replaced hysteria as a formal diagnostic label in version two of the Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1968 (Feinstein, 2011). CD was defined as an involuntary physiological manifestation (or conversion) of stress or trauma in the person's life (Baizabal-Carvallo et al., 2019; Feinstein, 2011) that often allowed them to escape a stressful situation (a primary gain) and provide them increased attention and support from loved ones and/or medical staff (a secondary gain), with psychiatry viewing the episode as a cry for help (Holladay, 2002; Nicholson et al., 2011).

The central diagnostic criteria for this condition emerged from these views about the origin of CD requiring the identification of a psychosocial trigger that could be the catalyst for the conversion reaction (Holladay, 2002). Treatment for CD traditionally centred around talk-based therapies, that helped the person to address and resolve their feelings towards the triggering event with the resolution of physical symptoms expected to follow shortly afterward (Feinstein, 2011).

Current views on Functional Neurological Disorder:

In the last 10 years the traditional model of CD, and the required identification of a psychosocial trigger has been challenged with numerous studies identifying that in many people with CD, no precipitating event can be identified (Baizabal-Carvallo et al., 2019;

Barnett et al., 2020; Cretton et al., 2020; Stephenson & Baguley, 2018). In response to these calls for change, both the ICD 11 and DSM 5 have removed this diagnostic criterion (American Psychiatric Association, 2013; World Health Organisation, 2018) and the label FND was added to help reflect this change (Stone, 2014).

The term 'functional' was adopted to reflect the everyday impact of FND on a person's life, previously the terms psychogenic, conversion and somatisation had been used to describe the symptoms but was found to have negative connotations for service users once an explanation of the term or diagnosis was given (Ding & Kanaan, 2016). One of the most challenging elements of FND as a condition, is the wide variability in both symptom generation and symptom severity. Nicholson et al (2020a) discussed this, and the complexity of working with people with a condition which presents with symptoms that straddle three important domains, the core FND symptoms, other physical changes (i.e. pain) and psychological challenges like anxiety, panic or dissociative symptoms.

As the accessibility of advanced neuroimaging has increased, i.e. functional Magnetic Resonance Imaging (fMRI), interest in identifying the pathogenesis and pathophysiology of FND by neurologists and neurosurgeons alike has grown, with numerous studies in print to date searching for a detectable change in the landscape of the brain in people with FND (Baizabal-Carvallo et al., 2019; Espay & Lang, 2015; Fiess et al., 2016; Stephenson & Baguley, 2018; Voon et al., 2016). Interestingly, Baizabal-Carvallo et al.'s (2019) review article cited findings of abnormalities in the fMRI scans of people with FND, including strengthened connectivity between the limbic system and motor control centres. Baizabal-Carvallo et al. (2019) highlighted the importance of these discoveries in reconceptualizing FND as a 'real' condition with tangible findings to help build acceptance of FND as a neurological diagnosis rather than purely a psychiatric one. From a neurological perspective the fMRI and Positron Emission Tomography (PET) scans discussed in that article all documented intact neural pathways, however, the level of connectivity and resulting movement changes was what was viewed as abnormal (Baizabal-Carvallo et al., 2019) and neural pruning is often considered to be a potential perpetuating factor in the chronicity of FND for some (Baizabal-Carvallo et al., 2019; Carson et al., 2012; Stone & Carson, 2011). The reconceptualization of FND as a neurological condition has begun to shift the way diagnosis and treatment is approached with the inclusion and adaption of neurorehabilitation models like motor control theory and Bobath style facilitation techniques as core FND rehabilitation skills (Barnett et al., 2020; Nicholson et al., 2020a; Nielsen et al., 2015).

The literature reports that it has been historically difficult to provide accurate statistics on the incidence of FND, though several sources report that it is the second most common reason to see a neurologist after headache (Baizabal-Carvallo et al., 2019; Cretton et al., 2020; Stone et al., 2014; Stone & Carson, 2011). Stephenson and Baguley (2018) estimated that up to 40% of those with FND experience long term disability, while Carson et al. (2012) discussed the effect of the chronicity of symptoms impacting overall recovery. Much has been written about the challenge of the diagnostic process and the conveyance of the diagnosis throughout neurology and medical literature. The fear of missing an 'organic' neurological issue (Stone & Carson, 2011), of causing offense and the fear that the person may believe instead that the neurologist or doctor was simply unable to find the actual medical issue dominated (Ding & Kanaan, 2016; Hallett, 2016). Other common concerns from medical staff when providing an FND diagnosis centre around the person suspecting that the doctor was subtly labelling them as mentally ill (Barnett et al., 2020). A diagnosis of FND can only be made by a neurologist after first ruling out any other neurological conditions that could possibly explain the person's symptoms via physical assessment, imaging, and medical testing (Daum & Aybek, 2013; Stone & Carson, 2011; Yam et al., 2016). Neurology literature acknowledges the importance of a common vernacular and standardised information being given when explaining the diagnosis, though consensus has not been gained on the best way to explain this (Baizabal-Carvallo et al., 2019; Cretton et al., 2020; Dahlhauser et al., 2017; O'Neal & Baslet, 2018; Stone et al., 2014). Within a hospital setting once a diagnosis is made, ideally, allied health and Psychiatry Liaison services would begin the treatment and recovery phase of the admission (Nicholson et al., 2020a). The psychosocial strategies needed to successfully work with a person with FND often sit outside the skill sets of therapists and doctors working in the general medical setting, as, for example, assisting a person with a hemiplegia from FND is very different to working with a person with a hemiplegia from a Stroke, though the physical impairments are often very similar initially (Nicholson et al., 2020).

The Aotearoa/New Zealand bicultural context:

Both the health system and the bicultural approach to healthcare in Aotearoa / New Zealand is unique and provides opportunities to expand the boundaries and assumptions of traditional western approaches to both physical and mental health practice, addressing the inequities between Pākehā and Māori and Pasifika peoples in Aotearoa/New Zealand (Ministry of Health, 2017, 2020; Te Rau Matatini, 2015). There has been a paradigm shift

in recent times toward a deeper consideration of Māori models of health and wellbeing, particularly in Mental Health services (Ministry of Health, 2020). In his 2011 discourse on the actions needed to bring greater health and wellness to Māori, Dr Mason Durie signalled the importance of building narrative models of health that work with Māori's unique history and world view, and spoke of the importance of non-Māori walking alongside Māori to empower them to have a greater voice in the delivery of healthcare (Durie, 2011). Building on the foundation created by Te Whare Tapa Whā (the four walls of Māori health) several Māori Mental Health clinicians and researchers have developed additional narrative-based approaches to explain the recovery journey in a way that resonates with Māori. Te Waka Kuaka and Te Waka Oranga (Elder, 2017) and Mahi a Atua (Rangihuna et al., 2018) draw on the rich storytelling history of Māori culture, to create analogies for Māori mental health consumers and their whanau to promote a collaborative approach to recovery. The rise in the number of culturally responsive integrated models of health and wellbeing provide a promising entry point to tackling the traditional western view of mind-body dualism, which is highly relevant for a condition like FND that straddles physical and mental health.

An occupational therapy view and approach to FND:

From an occupational therapy perspective, the impact of FND on daily functioning and occupational performance in both the acute and chronic stages can be profound with persistent symptoms interfering with all key life domains and roles (Dahlhauser et al., 2017; Klinke et al., 2019; Nicholson et al., 2020a). Occupational therapist's bring a unique perspective to FND rehabilitation as their focus on function over impairment is well suited to FND where impairment-based assessment commonly exacerbates the person's physical symptoms (Dahlhauser et al., 2017; Klinke et al., 2019; Nicholson et al., 2020a). In 2020, Nicholson et al.(2020a) published the first consensus guideline for Occupational Therapist's working with people with FND, which highlighted the value of the professions practice models i.e., the Canadian Model of Occupational Performance – Engagement (CMOP-E) (Townsend & Polatajko, 2007) in enabling recovery and providing a holistic recovery focussed journey for people with this diagnosis. The guideline also provided suggestions of models of practice and interventions that emerged from the consensus building process and were matched against the few intervention studies currently in print for occupational therapy and FND. Occupational Therapists are commonly found as team members within the interdisciplinary teams (IDT) in both

inpatient and outpatient therapy programmes for people with FND (Jacob et al., 2018; Jordbru et al., 2014; Klinke et al., 2019; O'Neal et al., 2018; Richardson et al., 2018; Yam et al., 2016). Occupational therapists arguably have the widest remit among the various team members due to occupational therapy's roots in physical and mental health practice (Gardiner et al., 2018; Nicholson et al., 2020a).

The evolution of FND as a scoping review topic:

As an occupational therapist working in the Acute hospital, I see first-hand how FND is so often misunderstood with an extensive body of practice wisdom handed down from health professional to health professional guiding treatment. Practice techniques and assumptions are not always based on current clinical evidence. I have observed many times that clinical staff have strong personal viewpoints regarding the validity of the person remaining in hospital for any form of treatment once a formal diagnosis of FND is made. This can have a significant effect on the type of care and level of recovery a person experiences. My experience is not unique; Kinkle et al., (2019) conducted a qualitative study examining the challenges experienced by health professionals when working with this cohort of people and highlighted the issue of stigma towards people with this diagnosis as a significant barrier to equitable care in the hospital setting.

I work within a medical-model dominated hospital setting where clinician's value evidence-based practice insights and recommendations, this Masters project will provide increased credibility when suggesting alternatives to the traditional way in which FND is managed in the hospital setting.

Selecting scoping review as the methodology for this review:

The current body of knowledge around the diagnosis, management, and recovery of people with FND is spread across a wide range of professions in the research sphere including neurology, psychology, allied health, nursing, and medicine, which employ a diffuse range of methodologies. The widespread body of literature surrounding FND has made creating a cohesive picture of hospital-based management of this condition very challenging.

This scoping review will draw together research from these areas to create a cohesive map of the body of evidence for FND assessment, management, and recovery in a physical hospital setting. Given the diffuse methodologies used in FND studies, scoping review methodology presents a valuable opportunity to bring together the emerging

diffuse evidence about FND and present an overview of the current body of evidence (Peters et al., 2020; Peters et al., 2015).
The completed scoping review will provide a starting point on which to examine how FND is currently managed within a hospital setting and where this sits with the current body of evidence. The eventual development of a clinical pathway for the treatment of FND would enable hospital staff to provide an equitable, safe, recovery-based service for a vulnerable population in line with both physical and mental health best practice.

Thus, my research question is “What is known about the rehabilitation management after diagnosis of FND in the adult physical hospital setting?”

Methods:

This chapter will detail the chosen methodology and approach taken to complete this research project. An overview of scoping review methodology and the steps taken to align with the Joanna Briggs Institute (JBI) (Peters et al., 2020) and the Preferred Rating Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews (PRIMSA-ScR) (Tricco et al., 2018) guidelines are explained. The decision-making process from the development of the inclusion and exclusion criteria through to the final selection and theming of data are chronicled. As this research was completed for a Masters Project the steps were carried out by the Researcher and discussed at length with the lead supervisor and co-supervisor to ensure the scoping review process was carried out rigorously, while being tempered by the academic restrictions in size and reach of a Masters Project.

Research Design:

This Masters project utilised scoping review methodology as a tool to synthesise the research from a wide range of disciplines and mapping the literature relating to the management of FND in the hospital setting. As discussed in the introduction chapter, many disciplines were involved in practice development with the FND population including neurology, psychology and psychiatry, medicine, nursing and allied health, meaning an approach like the scoping review enabled diverse research contributions to be drawn on to provide an overview and synthesis of the "lay of the land" (Colquhoun et al., 2014; Peters et al., 2015).

Scoping review methodology is underpinned by discrete steps to guide the research process including the development of the research question, creation and application of a search protocol, methodical screening and selection of literature for inclusion, charting of the data, then finally summarising and theming the data with recommendations for further research provided (Arksey & O'Malley, 2005; Colquhoun et al., 2014; Tricco et al., 2018). As scoping review methodology does not employ critical appraisal of research strength or quality, it is somewhat limited in its ability to make robust practice or policy recommendations (Colquhoun et al., 2014).

The JBI and PRIMSA-ScR (Peters et al., 2020; Tricco et al., 2018) formats were utilised to provide robust guidance on the application of scoping review methodology.

Search Strategy:

The search protocol for this scoping review was developed to capture the relatively recent change in titling for FND. The structured literature search used the following diagnostic labels as primary search terms: Functional Neurological Disorder (FND), Functional Neurological Symptoms Disorder (FNSD), Functional Movement Disorder (FMD) and Conversion Disorder (CD) as this enabled the charting of changes in terminology and approaches used for this cohort of people over the last 15 years. Table One below details the additional search terms that followed the diagnostic label and were selected to gather information from the diffuse body of literature on FND while targeting hospital-based interventions.

Table 1

Secondary Search terms

Search terms
Allied health
Intervention OR management OR treatment
Adult*
Culture
New Zealand
Challenge*
Experi?nce*
Training
Stigma
Occupational Therap*

In discussion with Waitemata District Health Board (WDHB) research librarians the following electronic databases were selected to encompass the wide range of disciplines publishing work around FND: The Cumulative Index to Nursing and Allied Health Literature (CINAHL) was selected as it draws from a large repository of allied health, nursing and psychology literature; Medline via EBSCO was selected for its strong links to medical and neurology sources; and finally, PsychINFO via OVID for its access to psychology, psychiatry and general mental health related material. Both peer reviewed and grey papers (i.e., expert opinions) would be captured via these databases.

Inclusion and exclusion criteria:

Article selection was limited to those published in the English language, and from 2006 onward to capture the evolving nature of practice with FND both before and after the introduction of FND as the main diagnostic titling, and to match the intention of the research question. Grey literature was included for wider context, though websites and books were excluded due to time constraints. Additionally, material relating to paediatric populations were excluded, as were studies held outside of the physical hospital setting due to the research question parameters.

Each database was searched using the four diagnostic labels combined with each of the secondary search terms i.e., "Functional Neurological Disorder" OR "Functional Neurological Symptoms Disorder" OR "Functional Movement Disorder" OR "Conversion Disorder" AND "allied health".

Sources of Evidence Screening and selection:

The electronic search was completed on the 23rd April 2021 and Appendix One contains the detailed search 'hits' from the three selected databases with a total results pool of 9,554 raw hits which were imported into the Zotero reference management software programme used by the Researcher. The screening and filtering of the raw results was completed in late May 2021.

The raw hits were imported into a blank Zotero folder using the programmes importing function and then duplicates were removed using the facility built into the programme, taking the first layer of entries to 3,976.

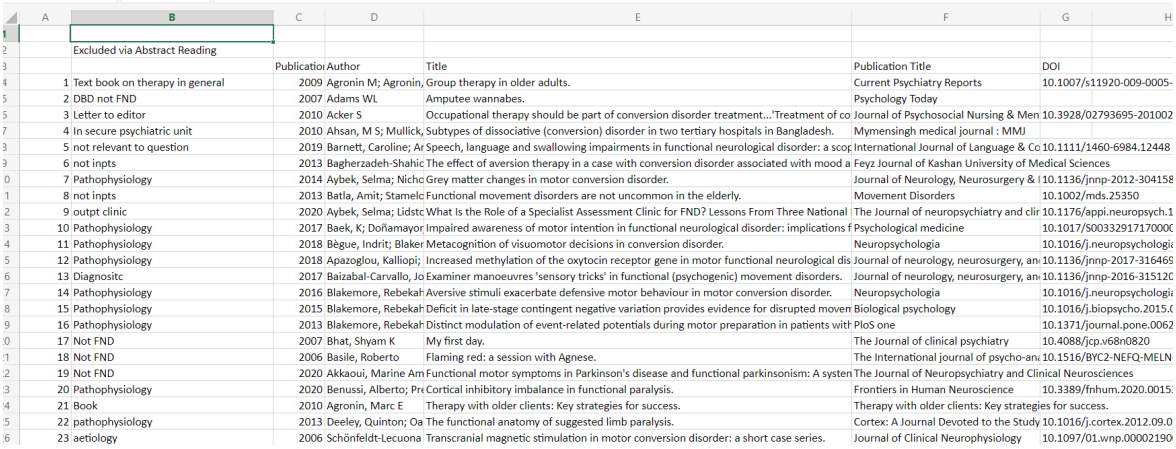
From that point onward the Researcher kept a Microsoft Excel workbook on Microsoft Teams as a live document that detailed the filtering process as the inclusion and exclusion criteria were applied. Filtering progressed through screening firstly at title review where the Researcher looked for wording signalling that elements of the exclusion criteria were present i.e. an article that declared it was examining a paediatric population or was set in the community. From the title screening the remaining articles were screened via abstract read through with application of the inclusion and exclusion criteria. Finally, the articles selected for full read were viewed for potential inclusion and the final articles' reference lists were hand searched to look for potentially relevant articles for inclusion in the scoping review.

Each layer of filtering, i.e. exclusion via title screening, had its own sheet. Each article entry excluded had a brief description of the reason for exclusion e.g. the excluded study was for an out-patient programme. This workbook was designed for increased transparency between the Researcher and the supervisors to show how the Researcher was working through this portion of the scoping review process.

Image One (Wilson, 2021) below shows an example of one of the Excel spreadsheets kept by the Researcher to demonstrate application of the inclusion and exclusion criteria during the abstract screening phase.

Image 1

Screen shot of the Excluded literature kept by Researcher during the screening process



		Excluded via Abstract Reading					
			Publicatio	Author	Title	Publication Title	DOI
	1	Text book on therapy in general	2009	Agronin M; Agronin,	Group therapy in older adults.	Current Psychiatry Reports	10.1007/s11920-009-0005-
	2	DBD not FND	2007	Adams WL	Amputee wannabes.	Psychology Today	
	3	Letter to editor	2010	Acker S	Occupational therapy should be part of conversion disorder treatment...'Treatment of co	Journal of Psychosocial Nursing & Men	10.3928/02793695-201002
	4	In secure psychiatric unit	2010	Ahsan, M S; Mullick,	Subtypes of dissociative (conversion) disorder in two tertiary hospitals in Bangladesh.	Mymensingh medical journal : MMJ	
	5	not relevant to question	2019	Barnett, Caroline; Ar	Speech, language and swallowing impairments in functional neurological disorder: a scop	International Journal of Language & Co	10.1111/1460-6984.12448
	6	not inpts	2013	Bagherzadeh-Shahic	The effect of aversion therapy in a case with conversion disorder associated with mood a	Feyz Journal of Kashan University of Medical Sciences	
	7	Pathophysiology	2014	Aybek, Selma; Nicho	Grey matter changes in motor conversion disorder.	Journal of Neurology, Neurosurgery &	10.1136/jnnp-2012-304158
	8	not inpts	2013	Batla, Amit; Stamelc	Functional movement disorders are not uncommon in the elderly.	Movement Disorders	10.1002/mds.25350
	9	outpt clinic	2020	Aybek, Selma; Lidstc	What Is the Role of a Specialist Assessment Clinic for FND? Lessons From Three National	The Journal of neuropsychiatry and clir	10.1176/appi.neuropsych.1
	10	Pathophysiology	2017	Baek, K; Doñamayor	Impaired awareness of motor intention in functional neurological disorder: implications f	Psychological medicine	10.1017/S0033291717000
	11	Pathophysiology	2018	Bègue, Indrit; Blaker	Metacognition of visuomotor decisions in conversion disorder.	Neuropsychologia	10.1016/j.neuropsychologi
	12	Pathophysiology	2018	Apazoglou, Kalliopi;	Increased methylation of the oxytocin receptor gene in motor functional neurological dis	Journal of neurology, neurosurgery, an	10.1136/jnnp-2017-316469
	13	Diagnositc	2017	Baizabal-Carvallo, Jo	Examiner manoeuvres 'sensory tricks' in functional (psychogenic) movement disorders.	Journal of neurology, neurosurgery, an	10.1136/jnnp-2016-31512
	14	Pathophysiology	2016	Blakemore, Rebekah	Aversive stimuli exacerbate defensive motor behaviour in motor conversion disorder.	Neuropsychologia	10.1016/j.neuropsychologi
	15	Pathophysiology	2015	Blakemore, Rebekah	Deficit in late-stage contingent negative variation provides evidence for disrupted moven	Biological psychology	10.1016/j.biopsycho.2015.(
	16	Pathophysiology	2013	Blakemore, Rebekah	Distinct modulation of event-related potentials during motor preparation in patients with	PloS one	10.1371/journal.pone.0062
	17	Not FND	2007	Bhat, Shyam K	My first day.	The Journal of clinical psychiatry	10.4088/jcp.v68n0820
	18	Not FND	2006	Basile, Roberto	Flaming red: a session with Agnese.	The International journal of psycho-an	10.1516/BYC2-NEFQ-MELN
	19	Not FND	2020	Akkaoui, Marine Am	Functional motor symptoms in Parkinson's disease and functional parkinsonism: A systen	The Journal of Neuropsychiatry and Clinical Neurosciences	
	20	Pathophysiology	2020	Benussi, Alberto; Pr	Cortical inhibitory imbalance in functional paralysis.	Frontiers in Human Neuroscience	10.3389/fnhum.2020.0015
	21	Book	2010	Agronin, Marc E	Therapy with older clients: Key strategies for success.	Therapy with older clients: Key strategies for success.	
	22	pathophysiology	2013	Deeley, Quinton; Oa	The functional anatomy of suggested limb paralysis.	Cortex: A Journal Devoted to the Study	10.1016/j.cortex.2012.09.0
	23	aetiology	2006	Schönfeldt-Lecuona	Transcranial magnetic stimulation in motor conversion disorder: a short case series.	Journal of Clinical Neurophysiology	10.1097/01.wnp.00002190

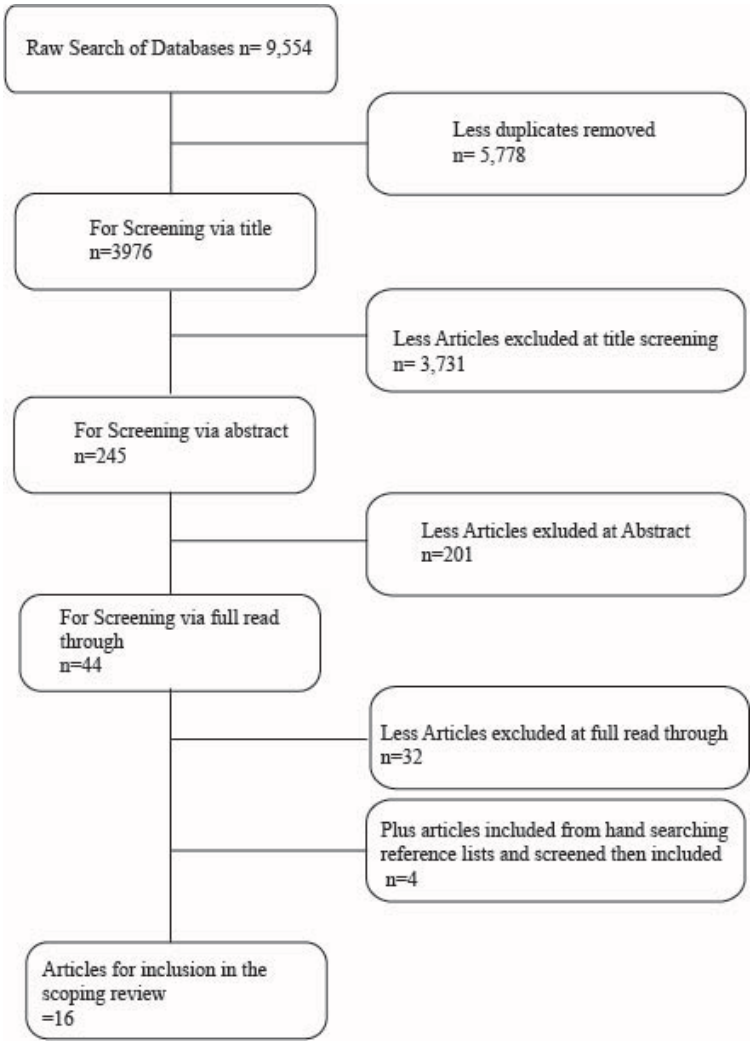
This information was made available on a shared Zotero library to enable the project's supervisors to view how the Researcher was progressing through the sorting of raw citations from the electronic search and enable discussion, review and challenging of the filtering decisions taken by the Researcher.

The layered filtering of the results was kept in separate sheets within the Excel workbook, Diagram One below details the screening and selection process with the initial starting point of 9,554 search results. Removal of duplicates reduced the number for screening to 3,976. Title and abstract screening were completed to ensure that the articles referred directly to adults (18 years and older) with the diagnostic labels set out in the search strategy actually included in the articles and referring to the physical hospital setting in some way reducing the number of eligible articles to 245 and 44 respectively. The 44 articles eligible for full read through were then read in their entirety for consideration for ultimate inclusion. Hand searching of the reference lists of the included articles was then completed. The final number of articles included in this scoping review was 16. Peters et

al. (2020) recommended that the final articles be summarised and reported in a charting table.

Diagram One

Screening of Search Results



Trustworthiness measures in the literature filtering process:

The Researcher's second supervisor completed a cross checking exercise to enhance the rigour of this scoping review by selecting 2 articles from those included in the review to ensure that the inclusion criteria were applied correctly. The Researcher also utilised supervision sessions during the screening phase of the scoping review to discuss potential inclusion and exclusion of articles that appeared to fall between the criteria laid out in the scoping review protocol, thus ensuring the Researcher could clearly justify the inclusion or exclusion of each contentious article.

Data Extraction:

The articles that met the inclusion criteria were logged on a charting table to record the key information from each source including: the Author with year of publication and country of origin, study aims, study design, the population (including the sample size), the intervention, the studies outcome and finally the findings relevant to the scoping review. The completed charting table can be found in the beginning of the Findings chapter.
The headings used for the charting table were selected to identify both the demographic information from each study, but also to points relevant to rehabilitation management that was the focus identified in the research question.

Analysis and Presentation of Results:

The charting table containing pertinent data from the 16 included articles was examined qualitatively by the Researcher, and four themes were identified via thematic analysis related to the parameters of the scoping review which focussed on the rehabilitation management of FND in the hospital setting. The Researcher used colourful highlighter-based coding on a printed copy of the charting table to help make linkages between the information contained in the study which enabled the identification of the themes.
Coming into the scoping review process the Researcher had recently completed other project work on FND rehabilitation and had some ideas on the likely themes that would emerge during thematic analysis, e.g., enabling attitudes and stigma had been prominent in the Researcher's mind coming into the charting process. However, as the highlighting of similar ideas and concepts grew on the charting document, the evolution of the themes changed. Enabling attitudes developed into Creating an Enabling Environment and was also partially represented in Positive Communication. Similarly, stigma became a smaller element in the Creating an Enabling Environment and Promoting Recovery themes. The Researcher brought the fledgeling themes to supervision sessions for discussion and review and reflected on how the evidence had differed from the Researchers initial ideas on the themes.
The four key themes ultimately identified were Positive Communication, Creating an Enabling Environment, Charting the Person's Recovery and Promoting Recovery.
The Findings chapter presents these themes in a descriptive summary alongside the charting table. An overarching discussion of the findings nestled within the wider practice context follows in the Discussion chapter of this manuscript, with suggestions made for further research in this area of clinical practice presented.

Summary:

Scoping review methodology's step wise process is well suited in guiding novice researchers as the robust guidance provided by the JBI, the PRISMA-ScR and published guides provide a strong base with which to display the breadth of the cross-discipline evidence present in the FND literature (Arksey & O'Malley, 2005; Colquhoun et al., 2014; Peters et al., 2020; Tricco et al., 2018).

Findings:

Introduction:

This chapter describes the findings of articles reviewed in this scoping review. The chapter will chronicle the 16 articles that were selected for inclusion in the scoping review by presenting key data points in a charting table (see Table Two below), alongside the establishment of four themes that emerged from the thematic analysis of the articles content.

The charting table below contains the following data points Author, year of publication, country of study origin, aims of the study, study design, the population and sample size, the intervention completed and finally the outcomes and key findings that relate to the research question. Building from the data recorded in the charting table the Researcher proceeded to examine the common points that flowed through many of the articles.

Table Three:

Charting table of selected literature

Author /Year / Country	Aims	Study Design	Population / Sample size	Intervention	Outcome / Key findings related to research question
Faul et al. (2020) United States of America	To investigate neural changes in patients with FMD after a one-week IDT based motor retraining programme	Quantitative study	n=14	One week motor retraining (MoRe) programme with IDT. 3 hours per day of Physiotherapy (PT) and Occupational Therapy (OT) and Speech Language Therapist (SLT) (if speech affected) and one hour of Cognitive Behavioural Therapy (CBT) with a psychologist. The CBT programme was based on a validated FND treatment manual.	Outcome: Assessment via pre and post intervention fMRI with an emotional go / no-go task with the Psychogenic movement disorders rating scale (PMDRS). Also assessed self-reported symptom improvement using Clinical Global Impression scale and Anxiety/depression using Beck Depression inventory and State-trait anxiety scale. PMDR scores were significantly reduced by 17.1 points. Key Findings: Motor retraining in FMD may reorganize activity and connectivity in information processing and motor planning networks with

					shifts in amygdala connectivity from posterior to frontal/pre-frontal regions
Frucht et al. (2021) United States of America	To provide a comprehensive review across the functional dystonia (FD) spectrum discussing diagnosis and management of FMD.	Literature review	Literature review size not discussed	A detailed summary of the approach used at Massachusetts General Hospital Dystonia Centre by MDT: PT- four principal components: education to promote understanding of the diagnosis; demonstration that normal movement s can occur; retraining movements with diverted attention and changing maladaptive behaviours that provoke symptoms. OT – encouragement of normal posture and movement via distraction; eliciting automatic movement, change	<u>Outcome:</u> Not discussed <u>Key Findings:</u> The Mental health training completed by OTs in their undergraduate years and their approach to practice meshes well with that is needed to treat FND. The presence of sensory processing symptoms is also common and similar in people with anxiety. Recommended therapists complete a sensory profile to ascertain if any sensory modulation work is needed for people with FND.

				of posture during activities; developing and implementing a balanced daily schedule to ensure graded reintroduction to daily living skills. Nil use of splinting. Structured approaches to goal setting were very important	
Gardiner et al. (2018) United Kingdom	To provide an introduction and review of FND for OTs using scoping review methodology and to highlight future directions for research.	Scoping review methodology	n=10	Outpatient programmes (n=3), in-patient programmes (n=7)	<u>Outcomes</u>: OT can play a key role in recovery from FND due to the nature of the theoretical models used, and the functional base for treatments as impairment-based interventions can exacerbate the symptoms initially. <u>Key Findings</u>: Thorough initial assessment including symptoms and triggers; 24hr routine examination (looking for boom and bust patterns); level of understanding and acceptance of the FND diagnosis' obstacles for

					rehabilitation; goal setting are highly recommended. Therapists in the studies reported they found it difficult to know when to cease input / when to discharge is full remission was not yet achieved. Education for family and carers is very important. Caution is needed when considering prescription of an aide as this can lead to reliance / reinforcement of a sick or disabled role
Hardin and Carson (2019) United States of America	Presented an example of an inpatient rehabilitation programme with a person with FND with paralysis and cataplexy	Case study	n=1 30 year old Caucasian woman with complex medical history. Had trained in special	22-day admission with IDT input from psychology, medics, psychiatry and allied health	<u>Outcome</u>: On discharge the person was independently mobile (over 150 metres) and independent with transfers. Berg balance score 53, Falls risk score reduced to 'no risk' and able to climb 60 stairs <u>Key Findings</u>: Purpose based pre-treatment IDT meeting held for the lead psychologist to explain the FND

	based on an operant behavioural based intervention.		education as a teacher but was not working due to her physical illnesses. Dependant on a power chair and a service dog for mobility and functioning was wearing a cooling vest for cataplexic episodes.		diagnosis and outline the operant behavioural model to guide the admission was very helpful. Agreed upon explanations and communication approaches were set and important for consistency. Key focus on scaffolding of tasks towards the person's goals Outpatient PT referral sent to continue re-conditioning. At outpatient follow-up she reported she had completed a 5 kilometre charity walk and maintained independence in functions post discharge.
Jordbru et al. (2014) Norway	To examine the effect of a 3-week inpatient	Cross over design to evaluate inpatient	n= 60 with 31 in the intervention group and 29	3-week inpatient rehabilitation programme consisting of adapted physical activity	Outcome: Mean difference between treatment and no treatment was 8.4 Functional Independence Measure (FIM) units (p=0.001, 95%

	rehabilitation programme compared with a waiting list control group condition and whether gains were maintained at 1 month and 1 year follow-up.	versus outpatient rehabilitation	in the control group Intervention carried out by Physician, PT, OT, Nurses, and an educator in Adapted Physical activity	within a cognitive behavioural framework	confidence interval) Improvements in gait were sustained at 1 month and 1-year follow-up. <u>Key Findings:</u> The intervention reinforced an alternative view of symptoms, positive reinforcement of normal gait and not reinforcing dysfunction. The explanation centred around reassurance that it is common to have disconnection between the nervous system and muscles, and that there are good chances for reconnection by attending multiple activities and a quick recovery can be expected Reassuring language and phrasing is needed The term FND / CD was not used.
Lehn et al. (2020) Australia	To provide an outline for the delivery of an educational course/lecture	Quality improvement project review	The "FND Masterclass" runs biannually over two	Training over two days: - Updating knowledge base - Videos shown of FND type tremor and attacks	<u>Outcome</u>: n=70 responded to pre and immediately post questionnaires. Of those 37 (53%) responded at 6month follow-up.

	about FND that was aimed at health professionals with varying degrees of knowledge and exposure to this client group.		days for staff based at an Australian hospital. Exact details of attendance were not provided.	with links for participants to view themselves later - Discussion of language and metaphor use - Access given to the FND training module the service designed for staff. - Lived experience discussions from clients who have had FND - Role play using actors - "Car Park" of questions to ensure trainers answers all questions in course of the 2 days.	Improvements in confidence and perceived skill in working with this cohort was maintained at follow-up. Immediately post training all reported greater confidence in working with FND clients. Key Findings: Trainers provided copious links to videos and reputable websites to enable participants to return to the resources after the sessions A learning and development guide was also created for staff to access. Local and international foundations/websites were also linked to, with encouragement given for staff to pass these onto clients for further support and information if needed
McKee et al. (2018) United States of America	To chronicle an inpatient IDT approach to FND management for the	Case study	n=1 with motor FND. Aged 25years old. Presented with pseudo-	Neurology and general medical assessment Psychological evaluation PT input.	Outcome: The client regained safe independent mobility with reduction in tremor on discharge. Key Findings: Neurology and general medical assessments were completed

	selected person alongside recommendations to aid in the diagnosis of this condition		seizures that progressed to weakness and tremor		A psychological evaluation was undertaken Focus on careful use of language PT input – progressive retraining of tremor and gait re-training. Referred for outpatient PT on discharge
Ness (2007) United States of America	Provide an overview of CD and description of successful PT treatment for three people with this FND	Series of case reports	n=3. Three women aged 18, 20 and 34 who were admitted to a hospital inpatient rehabilitation ward	PT input based on behaviour modification and shaping techniques; ignoring abnormal movements; and correct movement patterns reinforced with feedback and praise. The therapy programmes were based on management of organic disorders i.e. Stroke with hemiplegia but at a more rapid pace.	<u>Outcome</u>: All three women progressed to full symptom recovery and were discharged to home / work and school responsibilities at the end of the admission. <u>Key Findings:</u> The service considered the CD movements to be learned maladaptive behaviours therefore behaviour shaping was appropriate as a frame of reference. Attention was paid to removing the 'sick role' connotations for each woman.

					Interventions and FND was viewed through Skinner's learning theory for behaviour evolution. Links between the sick role and familial roles were carefully considered. Families were counselled on enabling language that would not reinforce the sick role. Recommended treatment progression was laid out in table form in the article.
Nicholson et al. (2020a) United Kingdom	To present recommendations for OT treatment for FND	Consensus guidelines – Occupational Therapy	Stage One: Professionals meetings with specialist occupational therapists to develop the guidelines. Stage Two: followed by IDT	Not applicable	Outcome: Development of consensus guidelines based on best available evidence and expert opinion. Key Findings: Recommendations are based on using a bio psychosocial etiological framework. Treatment should include education, rehabilitation within functional activity and the use of taught self-management strategies, graded return to functional activities. Open strengths based communication is important.

			specialists to review and debate recommendations from stage one Stage Three: Recommendations based on results of Stage Two meetings were made Stage Four: successive drafts of guidelines were circulated amongst MDT until		Treatment is best delivered as part of an IDT context for greater efficacy. OTs are well suited for working with the population because of the non-impairment focus inherent in OT assessment and interventions.

			consensus was reached		
Nicholson et al. (2020b) United Kingdom	To discuss the complexity and essential need for the development of appropriate measures to assess FND and progression in recovery	Perspective article	Literature review	Not discussed	Outcome: The dynamic nature of FND complicates the selection and development of outcome measures for FND, further research and development is needed in this area. There is no specific all-encompassing way to measure outcomes with FND clients currently in use. This is important and necessary work to rectify this. Key Findings: Recommendations for measure development/consideration: - Research into the applicability of non-FND specific measure that is routinely used are needed. - Personalised outcome measures for FND may be needed.

					- Stakeholder views on outcome measures specifically clients, carers, and health care professionals - Consideration of culture and age or other client characteristics that might affect measure development.
Nielsen et al. (2015) United Kingdom	To present recommendations for PT treatment for FND	Consensus guidelines – PT	Meetings held between PTs, neurologists, and neuropsychiatrists with extensive experience in treating FND	N/A	<u>Outcome</u>: Consensus guideline development <u>Key Findings</u>: Recommendations of using a bio psychosocial etiological framework. Treatment should address illness beliefs, self-directed attention and abnormal habitual movement patterns though a process of education, movement retraining and self-management strategies within a positive and non-judgmental context. Treatment should be delivered within an IDT context for greatest efficacy

Pick et al. (2020) United Kingdom	To identify existing outcome measures for FND to inform the development of future outcome measure use	Systematic review	Completed by members of the FND-Core Outcome Measures group.	Total of n=80 studies included in the review: n=40 randomised controlled trials and n=40 observational treatment studies	Outcome: Five measures were identified: 3 clinician rated scales: -Rating scale for functional pseudo non-epileptic seizures; Psychogenic Movement Disorder Rating Scale; Simplified -Functional movement disorders rating scale. 2 client rated assessments: -Conversion Disorder Scale - Revised and Conversion Disorder Scale Domains commonly assessed were related to physical symptoms, symptom impact and quality of life Key Findings: Continues work from the Nicholson et al, (2020b) working group above. Until specific rigorously tested measures are released for FND, it is recommended to use measures designed for FND or closely related populations.

Ranford et al. (2018) United States of America	Proposed expansion to the Gardiner et al (2018) article to include Sensory processing components in FND recovery/reha b	Letter to the editor	Not applicable	Proposed adding the Sensory Preference Checklist or similar assessments due to high rate of psychological co-morbidities in the FND population.	Outcome: Anecdotal report detailed improved attention; self-regulation and constructive coping mechanism development when sensory modulation-based strategies were added to treatment in their practice. Key Findings: Recommending a sensory preference checklist or sensory profile is considered for all FND clients who show some form of sensitivity to sensory stimuli. Recommend the Canadian Occupational Performance Measure (COPM) as an OT focussed outcome measure that focusses on functional recovery rather that symptom/impairment recovery.
Richardson et al. (2018) New Zealand	To examine the hypothesis that a nocebo-based	Retrospect ive consecutiv e case series	n=12 Set in a neurorehabili tation in-	A FND treatment protocol was applied in every admission supported by the rehabilitation unit's usual staff over a 17 month period.	Outcome: Mean improvement in FIM scores was 28.1 achieved in an average of 14.3 days. At 17month follow-up post discharge 25% had experienced no further symptoms, 42% had

	approach to FND treatment will be effective in symptom recovery in inpatient rehabilitation		patient setting. 6 were male and 6 female. Age range of 19-63 (mean 41.2 years old)	Estimated that people received between 2-4 hours of therapy a day, 5 days per week with nursing support available around the clock. Assessed using the unit's usual outcome measures	fleeting symptoms or insignificant symptoms that resolved independently, 25% had a symptomatic relapse but was less severe than the initial presentation. <u>Key Findings</u>: Nocebo Protocol - Medical staff explained key evidence regarding the intact nature of the person's neurological system. - Clinical psychologist took history (onset and cause), personal belief about the cause of their symptoms and their understanding of the terms "unconscious" and "placebo effect". Little to no conversation about emotional factors - The person with FND and staff created a 'nocebo model' to explain the discrepancy between the medical finding and their subjective experience (to create an alternative narrative of the symptoms)

					- They were encouraged to explore their noecebo model and create a new narrative – like it was just "a simple misfire in their intact neurological system" - Therapy techniques like video feedback of movement improvements, distraction techniques - Linking improved movement to reduced attention to symptoms - When symptom elimination was achieved, people were encouraged to push themselves to their ultimate limits to further prove their system is intact
Williams et al. (2016) United States of America	To provide rationale for in-patient rehabilitation for people with severe FND,	Discussion article	Not applicable	Motor retraining programme (MoRe) in a one week inpatient stay as follows: Daily PT, OT and SLT as well as 1hr psychology session – follow the validated treatment manual (Sharpe et al 2011).	<u>Outcome</u>: Not reported <u>Key Findings</u>: Videotaped on first and last day of the admission to show progress and outcome on discharge

	alongside recommendations for rehabilitation practices for this cohort of clients.			- Diagnosis made and explained - Consistent language and message with all staff - Analogy used: software/hardware, referring to the condition as a functional movement disorder vs. psychogenic to take mental health component out - Motor relearning approach used - Mental practice / visualisation of task success for the day - Graded approach to movement as client progresses - Quality of movement vs. quantity	Discharge home programmes also provided to maintain progress. Overall non-judgemental approach taken by all working with the person with open communication and reassurance given with good results.

				- Rest is built into programme - Progress is verbally reinforced, abnormal movements are ignored. Repetition is used to lock in gains - Assistive devices are removed as soon as possible	
Yam et al. (2016) United States of America	To describe a coordinated IDT approach to FND for a person admitted to a rehabilitation facility in California	Case study	n=1, male US Navy veteran, married with previous history of mood disorder in his youth. Presented with a	IDT input: Medical staff, psychiatry, psychology, OT, PT, SLT and recreational therapy FND diagnosis was made 5 weeks after admission. Treatment programme: - Psychotherapy focusing on precipitating trigger and overall adjustment skills and	<u>Outcome</u>: Symptom remission achieved at 13 weeks after admission. The person remained symptom free at 6 month follow up. <u>Key Findings</u>: An IDT approach was very helpful as his impairments straddled many disciplines.

			functional overlay on a background of a previous Stroke 5 months prior. Key symptoms: functional decline, increased left side weakness, numbness and cognitive deficits and returning poor balance and coordination.	illness beliefs - SLT for resolution of his stutter - PT included transfers training, gait retraining, stairs training and community mobility training, postural retraining - Recreational therapy included path finding, leisure education, functional leisure skills training, group activities for social activities including bicycle riding - OT addressed his left upper limb weakness especially the grip, coordination and shoulder function, balance and the ability to reach and grasp / squat / bend over etc. Techniques included graded	

				exposure, community reintegration, vocational rehabilitation -Medical Doctors assisted in medication management and coordination of treatment and gross admission trajectory.	

Using thematic analysis, the Researcher used colour coding of data points on a paper print-out of the charting table, looking for common concepts that occurred across the articles. As discussed briefly above in the Methods chapter, during the data extraction and theme development phase the Researcher came to some different conclusions than what had been expected during the initial set up of the scoping review. The Researcher found this to be one of the most useful learnings from this Masters Project, letting the data speak and putting aside pre-conceived notions of what the data would reveal. The Researcher utilised the supervision process to both reflect on what the data was saying and learnt how to step back from trying to drive the direction of theme development.

The themes ultimately identified were Positive Communication, Charting the Person's Journey, Creating an Enabling Environment and Promoting Recovery. Table Three below details the themes and sub-themes that emerged from reviewing the literature for this scoping review.

The naming of the four themes were consciously centred in recovery focussed language to mirror the findings of the scoping review, and to carry through an occupational therapy enablement view for people with FND in the hospital setting.

Table 3

Themes and sub-themes:

Theme:	Sub-theme:
Positive Communication	• The provision of the FND diagnosis as the first step in the recovery journey • Clear communication of expectations and role boundaries • The power of language
Charting the Person's Journey	• The challenge of "measuring"
Creating an Enabling Environment	• A cohesive team approach • Guiding philosophies / models of practice
Promoting Recovery	• Team set up • General rehabilitation approaches

	• Occupational Therapy and Physiotherapy for inpatient FND rehabilitation • Occupational Therapy interventions • Physiotherapy interventions • Discharge planning and onward referrals

Theme 1: Positive Communication:

The theme of positive communication flowed through the vast majority of the articles in this scoping review and was the most spoken about facet of FND management as it covered the moment of communicating the FND diagnosis, through to discharge from the hospital setting. The Positive Communication theme contained three sub-themes that addressed different portions of the admission and recovery journey, they were 'The provision of the FND diagnosis as the first step in the recovery journey', 'Clear communication of expectations and role boundaries' and 'The power of language'. A discussion of these sub-themes follows below.

The Provision of the FND diagnosis as the first step in the recovery journey:

As FND lies in the intersection of physical and mental health, communication plays an important role in the management of this condition in any practice setting. The treatment and management of FND begins at the point where the diagnosis is communicated to the person, as the understanding and acceptance of the diagnosis is a strong prognostic indicator of recovery (Frucht et al., 2021; Gardiner et al., 2018; Lehn et al., 2020; McKee et al., 2018). The studies included in this review universally stressed the importance of clear recovery-focussed language as pivotal to setting the scene for a successful admission for people admitted with this condition.

There are several schools of thought captured in this scoping review around the style of explanation best presented to people diagnosed with FND. The largest number of studies (n=12) advocated for an accessible factual explanation of the symptoms and the treatment that would be most beneficial. Within that cohort the level of detail provided differed: Gardiner et al (2018) and Lehn et al (2020) both advocated for a clear explanation about all

the conditions that were excluded before coming to the FND diagnosis and why, believing this built confidence and certainty for the person that the lead clinicians had not missed a potentially life-threatening disease and demonstrated that they were taking their symptoms seriously. Taking this one step further, Lehn et al (2020) also suggested that lead clinicians have an open dialogue with the person after delivering the diagnosis, asking if the person found the FND diagnosis acceptable; if they did not agree with the diagnosis, the lead clinician was to ask what they thought could be wrong with them instead, which would allow the lead clinicians to address the persons doubts item by item and build their faith in the diagnosis. McKee et al (2018) suggested adding an explanatory analogy if the person seemed to need this to enhance understanding of their symptom development. Hardin and Carson (2019) suggested that clinician's made an effort to demonstrate that they believed the persons symptoms were 'real' and valid; while others suggested directing the person with FND towards selected websites that have resources and accurate information on FND treatment and recovery (Frucht et al., 2021; Lehn et al., 2020; McKee et al., 2018). The involvement and endorsement of the FND diagnosis by the person's family and support people was only briefly discussed among the studies included in this review, but was suggested as important in the recovery of the individual with FND (Gardiner et al., 2018; Jordbru et al., 2014; Nicholson et al., 2020a).

Jordbru et al. (2014) and Richardson et al. (2019) could be considered outliers with their views around FND explanations, as their interventions centred on providing alternative narratives for the persons symptoms. Jorbru et al.'s (2014) programme was built upon the premise of providing an alternative explanation of the cause of FND without mentioning a diagnosis in any form to their service-users, while Richardson et al. (2018) adopted a Nocebo hypothesis as their explanation for the onset of FND for their participants.

Jordbru et al. (2014) was the sole advocate of not giving an explicit diagnosis in any form, rather presenting the person with an adapted explanation of their medical symptoms:

> At admittance the patients were given an adapted medical explanation of their functional disturbances, but no specific diagnostic label. The aim was to present an alternative understanding of their symptoms. The patients were told that there is no exact explanation of the symptoms, except that they commonly occur following stressful life events. Typically, explanations would entail telling the patients that thorough examinations have ruled out serious illness. The patients are reassured that it is common to see a disconnection between the nervous system and muscles. There

> are good chances for reconnection by attending multiple activities and a quick recovery can be expected. (p. 182).

Jordbru et al. (2014) differed from the other studies in another important way, their explanation above suggested to the person that their nervous system was broken in some manner with use of phrases like "a disconnection between the nervous system and your muscles" (p. 182) has occurred. Many of the practice based studies included in this review strongly discouraged any reference to breakages in the nervous system, or potential for people with FND to perceive that permanent damage is present, as the power of suggestion for this cohort of people is very strong (Frucht et al., 2021; Nicholson et al., 2020a; Nielsen et al., 2015; Richardson et al., 2018; Williams et al., 2016; Yam et al., 2016). Richardson et al. (2018) reflected that all of the people with FND that came through their service had an underlying belief in the frailty of their nervous system, that this seemed to fuel the FND symptoms, hence the development of the Nocebo approach used in their service, to provide a different viewpoint of the symptoms and reinforce that their neurons and neural pathways remained intact.

Richardson et al.'s (2018) Nocebo hypothesis approach provided an alternative narrative of the mechanism that triggered the manifestation of the FND symptoms in their population that was grounded in cognitive behaviour therapy (CBT). Their intervention hinged on the transparent sharing of their guiding philosophy and working with the person to fit their history into this philosophy, then continuously referring to this approach to further reinforce this alternative explanation.

Universally across the interventional studies, all authors stressed the importance of explaining the potential for full recovery for each person in a non-judgemental supportive way, linking their treatment approach as the best way to achieve this.

Clear communication of expectations and role boundaries:

Building rapport and engagement with people with FND and their support systems is a vital component of the therapy process (Nicholson et al., 2020a; Nielsen et al., 2015; Williams et al., 2016). This is noted to be challenging at times if the person has had negative encounters with health professionals related to their FND prior to that admission, as some with FND seek answers for their symptoms over longer periods of time (McKee et al., 2018). Building on clear communication around the diagnosis and underlying reason attributed to their symptoms, health professionals then need to work to build the faith, and confidence, of the

person with FND in the diagnosis in order for the person to make any gains in the admission (Nicholson et al., 2020a).

Jordbru et al (2014) and Williams et al. (2016) assert that it is important for the responsibility of the person's recovery be laid at the feet of the individual with FND. They recommend presenting the person with FND's role as the most crucial in the journey, with the emphasis on their level of engagement being a key determinant in the trajectory and speed of their recovery. Gardiner et al (2018) built on this concept by stating that discharge planning started on the day of admission in their service. A therapy contract with the person with FND would be drafted that clearly delineated the roles and responsibilities of both the therapists and the individual to set the expectation that the person is an active participant in their rehabilitation and helps to shift the person out of the 'sick role' as soon as possible. The Occupational Therapy and Physiotherapy consensus guidelines also endorsed the use of therapy contracts, though in a more casual context where the roles of each team member, including the person with FND, who should be viewed as a core member of the team, and their families roles were discussed openly at the start of the admission (Nicholson et al., 2020a; Nielsen et al., 2015).

The power of language:

The use of recovery focussed language and an emphasis on the person's intact nervous system were considered to be as important as the actual physical therapy that the person would receive for their FND symptoms (Nicholson et al., 2020a; Nielsen et al., 2015; Richardson et al., 2018; Williams et al., 2016). The use of a common vernacular amongst team members has been linked by several authors to the overall success of their respective interventions; from the way staff respond to questions about the persons symptoms (Lehn et al., 2020; Yam et al., 2016), the delivery of a consistent analogy that is used to explain FND (Frucht et al., 2021; Lehn et al., 2020; McKee et al., 2018), to the verbal response staff give when witnessing abnormal movements (Faul et al., 2020; Hardin & Carson, 2019; Richardson et al., 2018; Williams et al., 2016), or to the way staff reinforce gains during therapy (Jordbru et al., 2014; Richardson et al., 2018).

Lehn et al. (2020) spoke of the challenges in gaining this type of consistent communication across an ever-changing team line-up with shift changes, staff rotations and personal viewpoints acting as barriers to consistent communication. In response to these struggles, Lehn et al. (2020) developed the FND Masterclass programme for their organization to provide training for their staff. Their programme worked to close the gaps mentioned above

by using a mixture of traditional lecture style teaching, case study reviews, role plays with trained actors, exposure to lived experience discussions from ex-service users and group discussions.

Theme 2: Charting the Person's Journey:

The challenge of charting the admission for a person with FND is one that has been detailed across many of the studies profiled in this scoping review, whilst simultaneously acknowledging that outcome measurement is both a service requirement and a tool to use to demonstrate gains for people with FND. The reviewed studies used a range of measures to chart the progress of their participants and Table Four below details those used.

The subtheme 'The challenge of measuring' discusses the unique challenges inherent in outcome measurement in FND.

The challenge of 'measuring':

FND can present with a wide range of symptoms both physical, cognitive and psychological, in addition these symptoms are often highly fluid and can change in intensity from day to day and even within therapy sessions (Nicholson et al., 2020a; Nicholson et al., 2020b; Pick et al., 2020). The selection of measures to chart progress that were recommended or utilised by the studies included in this review can be broadly classified as those that are standardised, and those that are non- standardised. See Table Four below for a list of these measures.

Table Four:

Overview of key assessments used in the profiled studies:

Standardised:	Non-standardised:
Functional Independence Measure (FIM) (Jordbru et al., 2014; Ness, 2007; Nicholson et al., 2020a; Nielsen et al., 2015)	Activities of Daily Living (ADL) based assessment (Gardiner et al., 2018; Nicholson et al., 2020a)
Functional Mobility Scale (FMS) (Jordbru et al., 2014; Nielsen et al., 2015)	Patient health questionnaire (Pick et al., 2020; Yam et al., 2016)
Canadian Occupational Performance Measure (COPM) (Nicholson et al., 2020a; Ranford et al., 2018)	Videos – pre, during and post treatment (McKee et al., 2018; Nielsen et al., 2015; Richardson et al., 2018)

Psychogenic Movement Disorder Rating Scale (PMDRS) (Faul et al., 2020; Nielsen et al., 2015) Short Form Health Survey (SF-36) (Nielsen et al., 2015; Pick et al., 2020) Satisfaction with Life Survey (Yam et al., 2016) State Trait Anxiety Inventory (Faul et al., 2020) Clinical Global Impression Scale (Faul et al., 2020; Nielsen et al., 2015) Beck Depression Inventory (Faul et al., 2020; Yam et al., 2016) Neurobehavioural Symptoms Inventory (Yam et al., 2016) Modified Movement Disorder Rating Scale (MMDRS) (Pick et al., 2020) Simplified Functional Movement Disorders Rating Scale (SFMDRS) (Pick et al., 2020)	Conversion Disorder Rating Scale and Conversion Disorder Rating Scale - Revised (Pick et al., 2020)

There is much debate within the articles included in this review about the role of self-report measures in charting progress in FND recovery. Due to the strong link between dysfunctional attention and symptom appearance and severity, self-report measures were

argued to have the potential to temporarily increase symptom burden when completing them and may incur recall bias in the later stages of recovery (Nicholson et al., 2020a; Nicholson et al., 2020b; Nielsen et al., 2015; Pick et al., 2020). This same argument was applied to impairment based measures that require the assessors to declare the testing content and tasks required for observation, particularly in the early stages of recovery (Nicholson et al., 2020a; Pick et al., 2020). The occupational therapy focussed articles however suggested that the use of non-standardised assessments and measures like observational ADL based assessments, could be helpful in providing an overview of progress made during the admission and, significantly be used to chart the persons satisfaction with the way they are completing activities that they value, with a lower likely hood of triggering symptoms in the early stages of recovery (Gardiner et al., 2018; Nicholson et al., 2020a).

The role of standardised observational measures like the PMDRS which enables raters to score a person's gait from a video, was suggested as a way of bypassing the potential inadvertent exacerbation of symptoms when the person felt under pressure or observed (Faul et al., 2020; Nielsen et al., 2015). The therapeutic use of progress videos was trialled in two studies, and endorsed by the consensus guidelines for physiotherapy, as a way to both chart progress and to 'prove' progress in a condition where altered perception of movement is a key factor in symptom appearance and maintenance (Hardin & Carson, 2019; Nielsen et al., 2015; Richardson et al., 2018).

A working group of FND experts has been set up to examine and address these types of concerns and better document recovery, and, for countries where funding is attached to outcome measure scores, provide evidence to support the continued existence of these specialty programmes (Nicholson et al., 2020b; Pick et al., 2020).

Theme 3: Creating an Enabling Environment:

This theme provides an exploration of the physical and psychosocial environments detailed in the studies in this scoping review, and the recommended qualities that could lead to better recovery for people admitted to hospitals with FND. The Researcher found that each of the interventional studies described the overarching philosophy of their setting as a component of their therapy, alongside their team set up. The philosophy of each service also gave hints as to the belief of the therapy team on the underlying aetiology of the FND symptoms also. Flowing from this, the sub-themes are 'A cohesive team approach' and 'Guiding philosophies and models of practice'.

A cohesive team approach:

Jordbru et al. (2014) aptly described the goal of an effective inpatient therapy team as having a "mutual therapeutic understanding", with all those involved in the care of that person clear on the goals and therapy techniques to be used in each situation that might occur. Jordbru et al. (2014), Lehn et at. (2020) and Yam et al. (2016) all discussed the benefits of having an initial staff meeting facilitated by the lead clinician, to discuss the therapeutic approach to be taken for each person and how to give responses or directions to the person with FND that remained congruent with the selected service-wide approach. Yam et al. (2016) specifically reported that this helped to resolve some of the bias detected within their team members towards treating a person with FND on a neurorehabilitation ward. Jordbru et al. (2014) discussed the challenge of "drilling" the ward staff out of acknowledging abnormal movements in their FND participants, when the therapists and nurses' instinctual response would be one of care and concern - however, that response would not match the behaviour shaping and cognitive behavioural approach applied by their setting. Ness (2007) suggested that where possible consistent staffing would help with providing consistent care, and, as an added benefit allow the person with FND to build trust in their therapists and minimise handover time between therapists.

Ness (2007) acknowledged the role of the family as being part of the treating team. Ness (2007) spoke of the need to work with family to also reinforce the underlying method used in the unit i.e. behaviour shaping or the biopsychosocial lens in FND management. Jordbru et al. (2014) and Ness (2007), backed by the consensus guidelines for Occupational Therapy and Physiotherapy (Nicholson et al., 2020a; Nielsen et al., 2015), suggest that caution is needed when determining what kind of a role family should take in the persons rehabilitation, signalling that education is essential to ensure that they are not inadvertently reinforcing the 'sick role' for their family member, or, reinforcing abnormal movements which would hamper recovery outside of therapy sessions.

The guiding tenant of all the clinical studies was to focus on presenting the FND diagnosis, or alternative explanation, as a positive step toward recovery, that having this diagnosis is a step closer to returning to a full meaningful life.

Guiding philosophies and models of practice:

Biopsychosocial approach:

The biopsychosocial model was the basis for three of the studies included in this review (Frucht et al., 2021; Lehn et al., 2020; McKee et al., 2018) and was the recommended approach for occupational therapy and physiotherapy to nest their therapy within (Nicholson et al., 2020a; Nielsen et al., 2015). The biopsychosocial model examines and acknowledges the interaction between the persons physical state, their psychological state and the context or environment that they live within (Nicholson et al., 2020a). This was the recommended approach as the intensity of the FND symptoms is often influenced by a multitude of factors including: the persons physical health and wellbeing; their beliefs in the robustness of their nervous system; the presence of history of psychological challenges (i.e. anxiety or depression or the presence of a trauma history) and their daily context (i.e. work, financial or relationship stressors). The biopsychosocial approach also recommends therapists consider potential FND perpetuating factors, which could be identified during the admission i.e. if the stress from a vocational issue was magnifying the symptoms, the occupational therapist may be able to work with them to help resolve this issue or find alternative employment better suited to their needs (Nicholson et al., 2020b; Yam et al., 2016). Likewise addressing a person with FNDs trauma history may be highly beneficial in their recovery and general quality of life once remission of symptoms has occurred (McKee et al., 2018).

Cognitive behavioural therapy framework:

Richardson et al. (2018), Faul et al. (2020) and Yam et al. (2016), and to a lesser extend Jordbru et al. (2014) couched their therapy programmes within the wider framework of CBT, with a focus on the linking the person's thoughts and emotions to the triggering of symptoms (or behaviours) and the cycle that can develop that perpetuate these symptoms. Yam et al.'s (2016) case study discussed the role of the wider team adopting a CBT based approach in their therapy sessions, with examples given of how the Physiotherapist did this in their sessions. Richardson et al.'s (2018) setting adopted a Nocebo based protocol for all people admitted with FND, this protocol was based on key elements of CBT with recognition of the link between the persons perception or belief of their symptoms or dysfunctional neurological system, their attention to these symptoms and the flow on effect to movement quality (behaviours). The staff were instructed to prompt the person to recall this framework when movement quality improved and were cued to say things like "you have improved, yet we only changed your beliefs about the symptoms/what you attended to – we didn't touch

your legs" (p. 4). Unlike the other studies using a CBT type approach, Richardson et al. (2018) utilized additional tools like videos to show the participant objective evidence of their improvement while reinforcing the accuracy of the Nocebo narrative with good effect.

Behaviour evolution approaches:

Four studies utilized behaviour shaping and operant conditioning as their underlying approach to symptom resolution (Hardin & Carson, 2019; Jordbru et al., 2014; Ness, 2007; Williams et al., 2016). Operant conditioning and behaviour shaping are two techniques that require therapists to determine what the desired behaviour is, and the steps that are required for the person to demonstrate this behaviour (Jordbru et al., 2014; Ness, 2007). For example, operant conditioning was used in Jordbru et al.'s (2014) study with staff ignoring any undesired abnormal movements and only giving praise or positive reinforcement for the achievement of normal motor behaviour. As discussed earlier in this chapter this method was challenging at times for staff to not respond to a participant struggling during their therapy sessions as this would be viewed as rewarding a negative behaviour with positive attention. Behaviour shaping, as applied by Williams et al. (2016) and Ness (2007), considered that giving praise for any behaviour that contributed to the development of the target skill or action was acceptable, and more palatable for staff working with the participants.

Theme 4: Promoting Recovery:

This theme explores the mechanics of FND rehabilitation and recovery both from a service perspective and a clinician's practice perspective. FND requires a range of rehabilitation techniques that are nestled within the broader practice and theoretical context of the service in which it occurs (Frucht et al., 2021). In general rehabilitation practice the clinical team draw on a range of both physical and psychosocial skills in their quest to rehabilitate those in their care, in the context of FND rehabilitation there is a stronger focus on the psychosocial skills due to the nature of the disorder. This theme will explore those therapy skills and examine the disciplines involved in the rehabilitation programmes profiled in this scoping review. The following sub-themes will be discussed, 'Team set up', 'General rehabilitation approaches', 'Occupational therapy interventions' and 'Physiotherapy interventions' and finally 'Discharge planning and onward referrals'.

Team set up:

The therapy team for FND rehabilitation is most commonly made up of a lead clinician (i.e a Senior Doctor, Neurologist or Psychiatrist), Nursing staff, a Psychologist, an Occupational Therapist, a Physiotherapist, a Speech Therapist (if needed) and in some units there may be access to a Recreational Therapist (Ness, 2007; Yam et al., 2016) and for Jorbru et al.'s (2014) study a trained Adapted Physical Activity Trainer was also a key team member. A unified therapy approach is a key ingredient in the successful delivery of FND rehabilitation, as discussed above team meetings at the start of the admission are useful in setting the stage for rehabilitation, Ness's (2007) service also had weekly inter-disciplinary team (IDT) meetings to check in with the therapists and take a more global view of the rehabilitation journey of each person with a FND diagnosis under their care at those times.

The extent to which each member of the IDT plays a role in an admission varied across studies as the population of people with FND is highly heterogenous, as are their rehabilitation needs, consequently which clinician is to play the lead role is tailored to each person's needs or the services approach to FND rehabilitation. The occupational therapy and physiotherapy consensus guidelines endorsed their own professions as being the best suited to coordinating the treatment of people with physical impairments from FND (Gardiner et al., 2018; Nicholson et al., 2020a; Nielsen et al., 2015). Several studies nominated the resident psychologist as being best suited to lead the admission when their cohort of people with FND had significant co-morbid mental health issues, or, when the underlying approach to therapy was a psychological model like CBT or the nocebo approach (Hardin & Carson, 2019; Ness, 2007; Richardson et al., 2018). The motor retraining-based programmes detailed by Faul et al (2020) and Williams et al (2016) were led by a Physiatrist (a Senior Doctor with a specialty in rehabilitation medicine) as this was best suited to predominantly physical approach taken to the rehabilitation of their FND subjects.

Ness (2007) reflected that societies collective view of physical therapy (whether physiotherapy or occupational therapy) being the best treatment for gait or movement dysfunction encourages those with FND to engage in what they consider to be the focus of their rehabilitation, without the stigma of feeling like they are engaging in psychological rehabilitation for a physical problem in the early stages of their rehabilitation.

General Rehabilitation Principles:

Goal setting:

Goal setting was universally identified as a pivotal technique that was essential in creating a forward-facing perspective for the person with FND in the start of their recovery journey. Hardin and Carson (2019) and Ness (2007) chronicled the recovery of four severely impaired women in their case study and chart review research and discussed the importance of continual goal setting, recommending that the goals that would be continually graded in difficultly to represent achievable milestones of recovery. Hardin and Carson's (2019) case study subject was wheelchair bound, experiencing recurrent syncopal episodes, reliant on a cooling vest to ward off cataplexic episodes, dependant on a service-dog, and dependant on others for all her cares. The starting point for her recovery goals were necessarily modest and aimed at a small step forward towards the eventual hoped-for return to full independent function. Ness (2007) shared the recovery journey of three women with severe FND, with participant impairments included quadriplegia, bilateral tremor, limb jerking and truncal ataxia. The author discussed the step wise approach to recovery for these women and the use of graded goal setting, that felt achievable and not too intimidating for their participants at the start of their recovery when the starting point is of one of full dependence.

Psychotherapy:

Psychology support was highly recommended by several studies employing techniques based around CBT (Faul et al., 2020; Jordbru et al., 2014; Richardson et al., 2018; Yam et al., 2016), operant conditioning (Jordbru et al., 2014; Ness, 2007; Williams et al., 2016). The role of psychological talk-based therapies in addressing past trauma and co-morbid mental health challenges that may have contributed to or be perpetuating factors for the FND symptoms was strongly endorsed by Ness (2007) whose case study participants all had significant trauma histories that were viewed as contributors to their presentation. The role of psychology was also linked with helping the person with FND to formulate a relapse prevention plan and develop self-management strategies as part of discharge planning at the end of a hospital admission (Frucht et al., 2021; Ness, 2007; Richardson et al., 2018; Williams et al., 2016).

Assistive aides:

FND rehabilitation differs from that of traditional neurorehabilitation in an important way, the use of assistive aides is contraindicated in this patient group as it is widely viewed to reinforce the sick role and promote further dependence in this cohort of people (Faul et al., 2020; Frucht et al., 2021; Gardiner et al., 2018; Hardin & Carson, 2019; Jordbru et al., 2014;

Ness, 2007; Nicholson et al., 2020a; Nielsen et al., 2015). While the bulk of authors in this review wholeheartedly endorse this, there is an awareness that not all people with FND make a full recovery, alongside reported high levels of disability remaining in a significant portion of the FND population, making aide prescription a last resort if full remission of symptoms was not achieved.

Occupational Therapy and Physiotherapy for inpatient FND rehabilitation:

Occupational and Physiotherapy are the two professions with the most clearly documented roles in the inpatient management of FND in the literature located for this review. There are common therapy techniques used by both disciplines, and those techniques that are sit squarely in each discipline's toolbox.

The motor re-learning approach was utilised specifically by Faul et al. (2020), Ness (2007) and Williams et al (2016), this technique has been transitioned across from traditional neurorehabilitation practice, it is typically used in stroke and brain injury rehabilitation. Motor relearning in FND is underpinned by the assumption that the person's neural pathways remain intact, and that by utilising diverted attention normal movement will be subconsciously freed to occur, allowing therapists to 'prove' that the person is capable of normal movement again, using positive reinforcement and video to show this (Nicholson et al., 2020a; Nielsen et al., 2015). Therapist's then build on these occurrences to promote volitional evocation of the small normal movements, aiming to increase the frequency and magnitude of these as the session progresses (Nielsen et al., 2015). Both disciplines also utilise alternative postures to generate automatic movement i.e., encouraging movement in the quadruped position, 'skating' their feet along the ground versus walking or walking backwards versus forwards. These are all aimed at diverting attention and allowing automatic normal movement to occur (McKee et al., 2018; Nicholson et al., 2020a; Nielsen et al., 2015; Richardson et al., 2018).

An additional facet of motor retraining utilised by therapists in Ness's (2007) study was the progression of skills in line with traditional neurorehabilitation practice: for the person admitted with quadriplegia, therapy started with rolling, then moving into sitting, then achieving safe sitting balance, progressing through sit to stand transfer, weight shifting in standing then eventually to mobilising. As with stroke or head injury rehabilitation the therapist would not move through to the next phase until mastery was achieved in the current step, despite the persons neurological system being technically intact (Ness, 2007; Nicholson et al., 2020a; Nielsen et al., 2015).

Visualisation and mental practice are recommended treatment strategies endorsed by the consensus guidelines for each profession and utilised in several of the studies, the applicability of these two techniques capitalise on the link between attention and person's FND symptoms (Nicholson et al., 2020a).

Both disciplines utilise in-depth initial assessments as a tool for history gathering and rapport building in FND, looking for patterns between behaviours and actions that influence the intensity and frequency of symptoms, and delving into the persons level of understanding and acceptance of their FND diagnosis (Nicholson et al., 2020a; Nielsen et al., 2015). Occupational therapy however differs slightly in the overall approach taken in their initial assessments; initial assessments completed by Occupational Therapists for people with FND examine their life over a 24 hour period, explores occupational habits and roles that may influence fatigue management, investigates potential vocational needs and sources of stressors in this area, alongside building a picture of what functional activities are most important for the person to return to immediately to build intrinsic motivation with the creation of meaningful goals (Gardiner et al., 2018; Nicholson et al., 2020a).

Occupational Therapist Interventions:

Occupational therapy is well suited for working with this population as therapists have training in both physical health and mental health alongside models of holistic non-impairment-based models of practice (Frucht et al., 2021; Gardiner et al., 2018).

A number of specific occupational therapy skills were utilised in the studies profiled in this review including sensory modulation (Frucht et al., 2021; Ranford et al., 2018). Ranford et al. (2018) spoke anecdotally of successfully utilising sensory modulation approaches in people with FND, with and without co-morbid mental health issues, Frucht et al. (2021) spoke of the challenge for many people with FND who developed sensory based symptoms that were exacerbated by the dysfunctional levels of attention paid to these symptoms in the FND population. Nicholson et al. (2020a) promoted Occupational Therapists as being leaders in sensory modulation and discussed the benefit of including sensory processing questions in the initial assessment completed by therapists at the start of the treatment journey.

Other skills the occupational therapy consensus guidelines encouraged therapists to bring from mental health practice as was mindfulness and fatigue management, these techniques were also promoted as an intervention by Yam et al. (2016) for their veteran with co-morbid depression and Post-traumatic stress disorder (PTSD).

Physiotherapy Interventions:

Physiotherapy's primary background in musculoskeletal health is a strong fit for a condition that is based on abnormal movement and strength changes (Nielsen et al., 2015) and their consensus guidelines encourage therapists to build on their core physical skills and neurorehabilitation knowledge while acknowledging the need to adapt their treatment approach to accommodate the more present psychosocial components that weigh on a person with FND. Neilsen et al. (2015) asks therapists to entwine their physiological skills with psychological approaches like CBT, visualisation and operant conditioning as their service allows. Additionally, Fruct et al. (2021) and Hardin and Carson (2019) found that when the therapists utilised video or mirrors in the course of the treatment it was well received by the participants.

Ness (2007) and Hardin and Carson (2019) chronicled the journey of four people with profound physical limitations from their FND, with Hardin and Carson's (2019) participant being power wheelchair bound at the start of the admission. In these cases, the role for physiotherapists in the step-wise reconditioning of the individuals was a vital component in their recovery. This was seconded by Richardson et al. (2018) in their cohort with new onset FND, acknowledging how quickly people can decondition from FND.

Discharge planning / onward referrals:

McKee et al. (2018) detailed a recommended discharge planning process for people admitted to the acute setting with FND, citing anecdotal experience that rapid same day discharge without MDT based assessment can lead to re-admissions and further relapses of symptoms, they recommended that time be taken for occupational and physiotherapy reviews, psychology reviews to ascertain if any outpatient follow-up of any comorbid issues was required, alongside time for updates to be provided to the persons General Practitioner (GP) and referral to outpatient therapies be completed if needed.

For a planned discharge post rehabilitation several studies had provisions in place for vocational rehabilitation and community reintegration (Frucht et al., 2021; McKee et al., 2018; Yam et al., 2016), while Frucht et al. (2021) recommended the provision of home exercise programmes and both the occupational therapy focussed articles highlighted the importance of assisting the person to develop self-management and relapse prevention strategies (Gardiner et al., 2018; Nicholson et al., 2020a).

The majority of the participants in the interventional studies made enormous gains and walked unaided out of the wards at the end of their admissions. Richardson et al. (2018), Jordbru et al. (2014), Ness (2007), Yam et al. (2016) and Faul et al. (2020) reported that their participants remained independent and symptom free up to six months post discharge from their service.

Summary:

The findings that emerged from this scoping review provided insight into several different structured programmes for inpatient FND management in the hospital setting, whilst the approaches or service set up differed, there were four points on which all agreed: Firstly, positive communication is vitally important from the day of diagnosis and admission, through to the day of discharge. Secondly, the services and practice guidelines chronicled in this scoping review promoted an IDT approach to care, couching their interventions across three or more disciplines. Thirdly, the articles that discussed rehabilitation for FND recognised the importance of coupling physical rehabilitation skills with psychosocial rehabilitation skills in order to effectively meet the unique needs of people with FND. Finally, the recognition that FND straddles neurology, physical health and mental health domains was echoed throughout the literature profiled for this scoping review.

Discussion:

This chapter will draw together the findings of the scoping review while comparing these with the wider body of evidence, nestling this within an Aotearoa / New Zealand bicultural context. Key findings of the scoping review are discussed, including an analysis of the themes that emerged from this review. A comparison of key findings and the wider body of evidence in FND rehabilitation will be completed whilst providing an Aotearoa / New Zealand practice lens. Finally, directions for future research, limitations to this scoping review and broad practice recommendations will be presented.

The purpose of this scoping review was to explore what the literature had reported about the rehabilitation of adults diagnosed with FND in the physical hospital setting. The findings and insights from the 17 included articles in this scoping review were broadly divided into four main themes: *Positive communication, Creating an enabling environment, Charting the person's journey,* and *Promoting recovery*. *Positive communication* was the most prominent theme reported by all included publications as an essential facet of quality care. The need to present a clear explanation of the person's presentation, regardless of the author's standpoint on FND's aetiology, and a cohesive team approach to facilitating symptom resolution for each person in their care featured frequently. The interpersonal communication between health team members was also noted and emphasised widely as an essential component for case management for this cohort of people when *creating an enabling environment*, with all services profiled promoting an inter-disciplinary lens to care, and a unified philosophical approach to care i.e. nestling the service inside a biopsychosocial model of care.
The specific challenges of *charting the person's journey* via the appropriate use of outcome measurement and *promoting recovery* using FND specific methods of rehabilitation, all featured prominently in the literature and consensus guidelines - these themes have been echoed and expanded upon in the wider literature also and will be discussed in greater depth in this chapter. The mechanics of rehabilitation and the recovery pathway for participants with FND were comprehensively detailed in the literature chronicled in this review, particularly with the inclusion of two consensus guidelines from both Physiotherapy and Occupational Therapy discussing the relevance of bringing techniques from both physical and mental health practice to the FND rehabilitation space i.e. CBT and motor control theory.

An overview of the identified themes:

Positive Communication:

Positive communication was a prominent theme that emerged from this scoping review. While the literature included in this review advocated for a common vernacular to be used to improve clarity and acceptance of the FND diagnosis, many authors discussed the challenges in getting widespread clinician agreement on a singular diagnostic label or analogy due to involved parties individual viewpoints on FND's aetiology (Baizabal-Carvallo et al., 2019; Cretton et al., 2020; Dahlhauser et al., 2017; den Boeft et al., 2017; O'Neal & Baslet, 2018; Stone et al., 2014). The phrasing and presentation of the diagnosis has been suggested by several authors in the wider FND sphere to have a significant impact on the acceptability and perceived offensiveness of the diagnosis (Barnett et al., 2020; Carson et al., 2012; Gardiner et al., 2018; Lehn et al., 2019; Nicholson et al., 2020a; Nielsen et al., 2015; O'Neal & Baslet, 2018). Ding and Kanaan (2016) sought to explore this idea further by completing survey research on non-FND participants in an outpatient clinic waiting room to examine how the common terms used to label FND were perceived, then adding a full explanation to each diagnostic label. Participants were then asked how offensive each label was perceived to be for them i.e. medically unexplained symptoms, FND, somatoform disorder, psychosomatic disorder and conversion disorder. The explanation given of each term changed the participants levels of offense significantly, suggesting that a diagnostic label is only as helpful as the explanation of it given to the person receiving it. This study acknowledged the limitation of using participants without FND in their study. The use of strengths-based language in presenting the diagnosis, and, in utilizing recovery focused language in the proposed treatment pathways were highlighted by all the interventional studies as being a specific tool to set the scene for the journey to come for people presented with this diagnosis.

Jordbrau et al.'s (2014) unique approach of not communicating a diagnosis to their service users diverged significantly from the other studies included in this review, and those based in the FND out-patient clinic settings (Czarnecki et al., 2012; Dahlhauser et al., 2017; Maggio et al., 2020). The decision to not provide a diagnosis would be a potential ethical challenge when viewed through an Aotearoa/New Zealand health service lens. The Code of Rights (Health and Disability Commissioner, 2012) is used as a guiding document for health service provision, and states that each consumer has the right to both open and honest

communication (Right 5.2) and the right to be fully informed about their condition and the options available to manage that condition (Right 6.1). Both Right 5 and Right 6 provide reassurance to involved parties that the person is able to make an informed decision about their care plan (Right 7). In contrast to the Jordbrau et al. (2014) study, Richardson et al.'s (2018) service continued the documented FND diagnosis with their service users, but provided an alternative conceptual framework for the person to understand their symptoms, therefore would not be seen to be withholding important health information that would be required to enable informed consent to be given. It is worth nothing that the Richardson et al. (2018) study was based in Aotearoa / New Zealand, thus was required to meet the standards laid out in the Code of Rights.

Creating an Enabling Environment:

Many of the studies included in the review discussed the role of a unified team approach to working with people with FND in their hospitals and the challenges this presented in an environment with ever changing staff across shifts and clinical rotations (Jordbru et al., 2014; Lehn et al., 2020; Ness, 2007; Yam et al., 2016). The challenges presented in those studies were echoed in survey-based research within the wider FND sphere, with Lehn et al. (2019) and Klinke et al. (2019) also raising the challenge of stigma and bias from staff towards working with this cohort of people as not just an obstacle to a united team approach to care, but also suggesting this was also an unfortunate determiner of the level or type of therapy a person might receive. Over the last 10 years an increasing number of studies have been examining the effect that the clinician's personal viewpoints have on the type, and level of active therapy input a person receives after being diagnosed with FND (Barnett et al., 2020; Lehn et al., 2020; Nicholson et al., 2011; Stone, 2014). Klinke et al.'s (2019) focus group study discussed the role of the health professionals underlying beliefs about FND, suggesting that if the health professional themselves believe the person was manipulating or manufacturing their symptoms, that it then provided a barrier to an effective therapeutic alliance. That was seconded by Barnett et al. (2020) in their qualitative synthesis study that reviewed 11 qualitative studies of clinicians working with people with FND. They reported that an overarching theme from interviews with clinicians was of negative attitudes, with phrases like "attention seeking", "troublesome", "annoying" or "impossible to help" appeared frequently in interviews with therapists and clinicians. Many of these issues appeared when the people with FND were being treated on general acute or rehabilitation wards where "real" unwell or impaired people were also being treated (Barnett et al., 2020;

Klinke et al., 2019; Lehn et al., 2019; Yam et al., 2016). Lehn et al.'s (2020) FND Masterclass programme appeared purpose designed to address those barriers to equitable care in the hospital setting and presented some promising early results in their paper. The Masterclass itself was held biannually and ran over two days, as a training opportunity that involved specialist speakers, role play with trained actors, presentations from people with FND about their experiences and opportunities for open discussion to share perspectives and learning.

Charting the Person's Journey:

The clinical dilemma of how to meaningfully assess a person's abilities who has FND is a unique and challenging element to FND rehabilitation was discussed at length in many of the studies (Faul et al., 2020; Hardin & Carson, 2019; Nicholson et al., 2020a; Nielsen et al., 2015; Pick et al., 2020). The consensus among these authors, and within the wider FND research sphere is the feedback loop that links dysfunctional attention and symptom generation can be triggered by impairment-based testing of their symptoms in the early stages of recovery (Czarnecki et al., 2012; Jacob et al., 2018). The challenge then becomes, how do real-world therapists move away from the assessments designed to elicit impairment that they are well acquainted with, and move towards more strengths-based or observational activity-based assessment methods within an impairment-based hospital system? In the findings chapter a range of available assessments for use with the FND population were presented (see Table Four), though the challenge of assessment selection needs careful consideration, particularly when therapists in a real-world setting approach the process of FND assessment with people on a generic hospital ward. Additionally, the physical hospital work setting has long been recognized as being a work setting dominated by the medical model, with standardized or score based outcome measures being seemingly preferred to facilitate decision making (Bowman, 2006; Crennan & MacRae, 2010; Pick et al., 2020). Marrying the risk of exacerbating FND symptoms by using the 'usual' assessments in the physical hospital setting and the perceived need for the lead clinicians to have information they are at ease with, presents a unique challenge for the hospital-based IDT.

Promoting Recovery:

As FND sits at the intersection of physical health, mental health and neurology, so do the therapy techniques recommended to treat FND (Gardiner et al., 2018). The therapy techniques discussed in the profiled literature and captured in the charting table contain a mix of traditional physical rehabilitation skills and psychosocial rehabilitation skills. It was interesting that many of the skills considered to be psychosocial therapy skills could be

implemented by hospital-based physiotherapists or occupational therapists with some added training building on their existing knowledge.

Psychosocial therapy skills like visualization, cueing for operant conditioning, mindfulness, relaxation and diversionary techniques were recommended to be used to augment the more standard therapy techniques commonplace in the hospital setting, i.e. occupation-based assessment, mobility assessment and practice, transfers reviews, through to motor retraining practice or bobath style facilitation techniques for neurological therapists (Nicholson et al., 2020a; Nielsen et al., 2015). In contrast the outpatient studies that sit in the wider FND sphere of literature have a more defined, concrete role boundary between the physical based therapists and the psychology support provided in the studies (Czarnecki et al., 2012; Dahlhauser et al., 2017; Jacob et al., 2018; Maggio et al., 2020). Both inpatient and outpatient studies set the expectations and role boundaries for their own service. The physical interventions provided across inpatient and outpatient therapy settings were consistent and recognized in the consensus guidelines for occupational therapy and physiotherapy.

Aotearoa / New Zealand Context:

The literature search completed for this scoping review identified one study based in Aotearoa / New Zealand (Richardson et al., 2018) which was set within a specialist inpatient neurological rehabilitation unit in Dunedin. However, the study made no reference to the bicultural practice context found in Aotearoa / New Zealand, nor did it provide the overall cultural demographics of the cohort of the service-users during the period the study profiled the FND intervention having been routinely used. Richardson et al. (2018) drew parallels to Jordbrau et al's. (2014) approach to FND management where both services did not focus on any potential psychosocial components related to the persons development of FND, and this may potentially be why cultural components were not discussed in the Richardson et al. (2018) study.

While the literature provided did not directly address practices to acknowledge and support their service users cultural needs, several authors suggested that stepping away from the dualist approach traditionally found inside the physical hospital setting was a key component in increasing the quality of the recovery journey for those diagnosed with FND (Frucht et al., 2021; Hardin & Carson, 2019; Lehn et al., 2020; Nicholson et al., 2020a; Yam et al., 2016). This recommended shift to integrating physical and mental health approaches meshes well with the Māori and Pacifica models of health and well-being found in Te Whare

Tapa Whā (Boulton & Gifford, 2014), the Fonofale Model and The Fonua Model (Mauri Ora Associates, 2015) which recognize the interrelationship between the physical, spiritual and the mental elements while considering the overarching presence of the person's culture. Many of the studies profiled in this review endorsed the value of open conversation and history taking to understand each person's unique context and presentation and to build rapport with the person and their family/whānau. The concept of Te Waka Oranga (Elder, 2017) appears to fit well within the FND context, this model was originally developed for Māori mental health service consumers at the start of the journey with their clinicians to help provide a familiar narrative with which to understand each element of their journey with the service they were engaging with. This concept appears quite transferrable to a Māori service user with FND as many of the components remain the same. The underlying purpose of Te Waka Oranga is to ensure that all parties are paddling the waka in the same direction towards a goal that is meaningful for the service user (Elder, 2017) which holds true for Māori people with FND.

Additionally, the Meihana Model (Pitama et al., 2007, 2014) would add value and guidance for clinicians working with Māori with FND, as it places the person and their whanau at the centre of the intervention, and provides an operationalised version of Te Whare Tapa Whā for therapists, with guiding questions to examine the resources that Māori bring to their recovery journeys.

There is a considerable gap in the existing literature at the time this scoping review was conducted, particularly around the acknowledgement of culture being a recognized component in any person with FND. Further studies based in Aotearoa/New Zealand are needed to explore this facet of care.

Limitations of this Scoping Review:

A key limitation of scoping review methodology is the caution it asks for when considering making any specific recommendations for practice as this methodology does not involve robust critique of the studies included in it. This scoping review is one of the first to draw together the many elements represented in the hospital based FND literature, a larger scale review study would be very helpful in drawing out further information that could be used to more widespread practice recommendations.

The search terms the Researcher generated to locate FND specific material attempted to capture all possible names used to describe this condition, as it varies widely between

countries and service briefs. The Researcher acknowledges the potential that there may be other terms used that were not included in the search strategy in this review.

The setting specific parameters excluded a significant number of hospital-based articles during the screening process that took place in inpatient psychiatric units that utilised the very similar interventions with the same population that the included studies did. The application of the physical hospital limiter however better matched the setting the Researcher was endeavouring to chronicle to answer the research question posed for this review.

Recommendations for Future Research:

The topic of FND is a complex one with many facets that need to be explored and understood more fully before robust practice recommendations for the hospital setting could be presented. The Researcher recommends further research be completed into the entire hospital journey of people with FND. There was a paucity of studies that examined the lived experience of those with FND in the hospital setting, that if completed would allow therapists to better understand the impact of current service provision on this vulnerable cohort of people. Developing a study to better understand how real-world therapists select and use assessments in general practice inside the physical hospital setting would be helpful in adding to the outcome measure discussions underway in the wider FND literature sphere. Of the 16 studies included in this scoping review, only one was based in Aotearoa/New Zealand, though it did not examine the unique practice context working in this country provides. It would be beneficial research to be carried out in Aotearoa/New Zealand that examines the effect of this country's bicultural practice setting has on people with FND.

Recommendations for practice:

The primary starting point for practice change for FND inside the hospital setting could be viewed as the need for an evolution in mindset for a range of clinicians away from a dualistic view of health within the hospital setting. When FND is viewed as a purely psychiatric condition, and, with hospital beds being viewed as meant for people with physical illnesses only, then a fundamental dissonance would be expected for many staff. However, when the view of FND is expanded to see it as a neurological issue, then acceptance of people with FND in the hospital, involvement of the interdisciplinary team would likely come with more ease.

When considering the dissonance that seemed to plague staff profiled in the wider FND literature, the need to have therapists enter their careers with a clear understanding, and acceptance of the interaction between physical health, mental and spiritual health and cultural balance would be large step forward towards having clinicians who would act with authentic compassion and understand the complexity and nuances found in working with this cohort of people.

The establishment of a clinical pathway for people presenting with FND to the physical hospital would be very helpful. It would be recommended to include criteria for referrals to other services i.e. when to involve allied health or mental health services in the admission, the overarching philosophy to be taken for those involved in FND cases in the hospital, alongside the accepted vernacular and psychological approaches to be taken (i.e., operant conditioning, CBT etc.). Criteria for community-based services for onward referrals would also be beneficial to include to help round out the admission for those with residual symptoms on discharge. The occupational therapy and physiotherapy consensus guidelines (Nicholson et al., 2020a; Nielsen et al., 2015) presented a detailed explanation of how their documents were developed and a similar approach could be used for services aiming to set up an interdisciplinary service delivery document for their organisation.

Underlying the clinical pathway, the development and delivery of a robust training programme for hospital staff would be the bedrock on which a clinical pathway could be constructed.

Conclusion:

This Masters Project scoping review sought to answer the question "What is known about the rehabilitation management of Functional Neurological Disorder after diagnosis, in the physical hospital setting?" applying the methodological framework recommended by the JBI (Peters et al., 2020) and the PRIMSA-ScR (Tricco et al., 2018) for scoping review research. This Masters Project was developed by the Researcher to explore the current body of knowledge in the management of FND in the Researcher's physical hospital work setting, to both help inform the development of clinical practice and to provide the backbone for the eventual development of a care pathway for FND in the physical hospital setting in the Researcher's home District Health Board.

This scoping review drew on research elements from the areas of allied health, medicine, nursing, and mental health using search terms and databases designed to cast a wide net to examine the hospital-based management of FND. Multi-level filtering of the search results was completed, and ultimately 16 articles met the inclusion criteria for this review ranging in methodologies from case study research, consensus guidelines, literature reviews, survey, and qualitative research designs. Four themes were identified during the charting process; Positive Communication, Creating Enabling Environments, Charting the Person's Journey and Promoting Recovery and their subthemes were explored in the Findings chapter. The Discussion chapter placed the findings within the wider sphere of FND literature and an exploration of the Aotearoa/New Zealand context highlighting potential models of practice that could provide the framework for culturally sensitive practices for people with FND of Māori and Pacifica decent. Finally, limitations, and research and practice recommendations were outlined that could further develop the FND literature space and enhance the care received by people with FND in the physical hospital setting.

The reconceptualization of FND as a neurological condition appears to be in its infancy in the settings examined in wider FND literature, as indeed it is seen to be in the Researcher's own work setting. The literature profiled for this scoping review however demonstrated programmes that had moved away from the traditional dualistic thinking that has long been dominant in the hospital setting. The FND practice context provides the opportunity to have teams of both physical and mental health clinicians working together in the inpatient setting, each bringing important skills to the table. This could provide a non-dualistic learning

environment that in time could eventually flow on to the wider hospital setting (Lehn et al., 2020; Nicholson et al., 2020a).

Stephenson and Baguley (2018) reported that an estimated that 40% of people with FND experience persistent disability. This statistic suggests that there are some significant gaps in the provision of rehabilitation in all settings for this vulnerable population. The management of FND in the hospital setting for those presenting with the most severe symptoms, provides an important opportunity for intervention from the wider IDT present in most acute and rehabilitation hospitals. The ways in which this could be done is worthy of further research and examination.

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Appendix One:

Database search record – search completed 23rd April 2021:

Database:	Search Strings:	Hits
CINAHL	FMD, FND, FNSD, CD	
	AND allied health OR stigma OT Occupational therap*	9
	AND intervention* OR management OR treatment*	314
	AND adult* OR culture* OR New Zealand*	859
	AND challenge* OR experi?nce* OR training	170
Medline via EBSCO	FMD, FND, FNSD, CD	
	AND allied health OR stigma OT Occupational therap*	20
	AND intervention* OR management OR treatment*	812
	AND adult* OR culture* OR New Zealand*	1808
	AND challenge* OR experi?nce* OR training	443
PsychINFO via OVID	FMD, FND, FNSD, CD	
	AND allied health OR stigma OT Occupational therap*	114
	AND intervention* OR management OR treatment*	2141
	AND adult* OR culture* OR New Zealand*	2317
	AND challenge* OR experi?nce* OR training	547