

# EXAMINING THE ROLE OF SLEEP AND DREAMING IN FUNCTIONAL NEUROLOGICAL DISORDER

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## Introduction

- Patients with Functional Neurological Disorder (FND) frequently report experiencing sleep disturbance (Ducroizet et al., 2023).
- Sleep quality can potentially exacerbate nightmares and impact the emotion of dreams, which in turn may worsen the physical function of FND patients (Conte et al., 2021).
- The impact of sleep and dreams on FND symptoms is not well described.

## Aim

This study investigated self-reported characteristics of sleep and dreaming in, and their relationship with FND symptoms.



## Participants

- 373 participants aged over 18 with a self-reported diagnosis of FND.
- Female (86.1%), 31-50 years old (48.5%).

Participants who reported zero dream recall (18%, n= 67 of 373) were excluded from the dream-related questions in this questionnaire.

## Measures

- BMI, FND symptoms, diagnosis of Sleep disorders and Psychiatric disorders.
- Sleep assessment (sleep quality, sleep duration).
- Dream assessment (dream content, nightmare frequency).
- Changes related to sleep/dream (mood, symptom change).

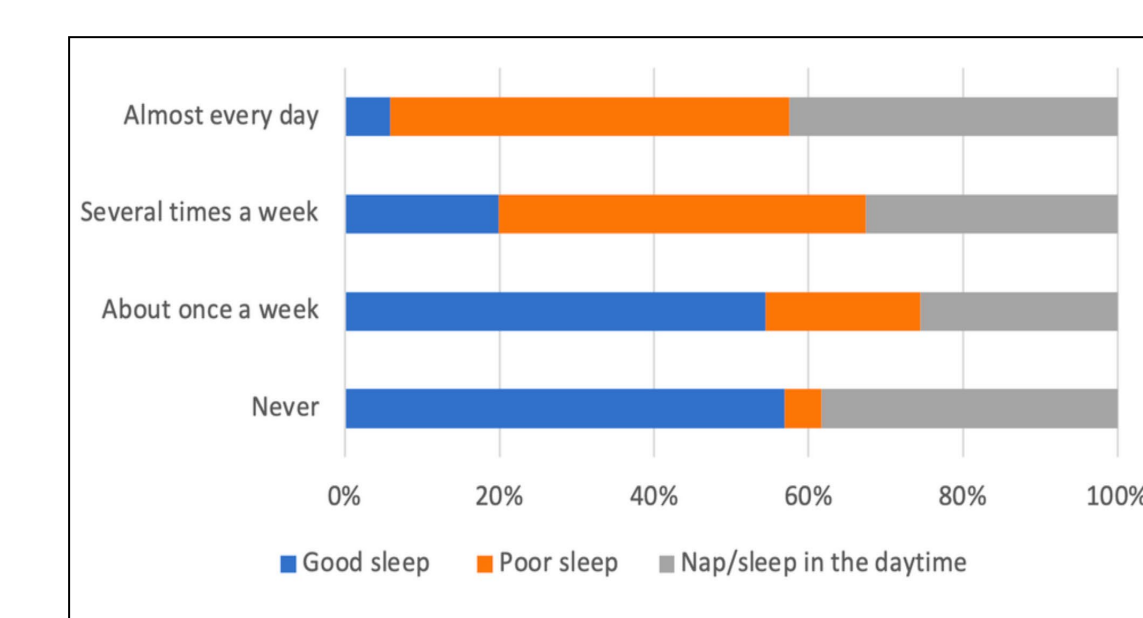
## Analysis

- Descriptive statistics
- Spearman rank correlation coefficients
- Unadjusted odds ratios (OR)

## Results

### Poor sleep

- Poor self-rated sleep quality (bad, very bad) (72.6%), at least 1/w poor sleep (97.6%).
- < 6 hours of sleep (41%), (in the UK, only 10.1% of people sleep for less than 6 hours (Lamote de Grignon Pérez et al., 2019).



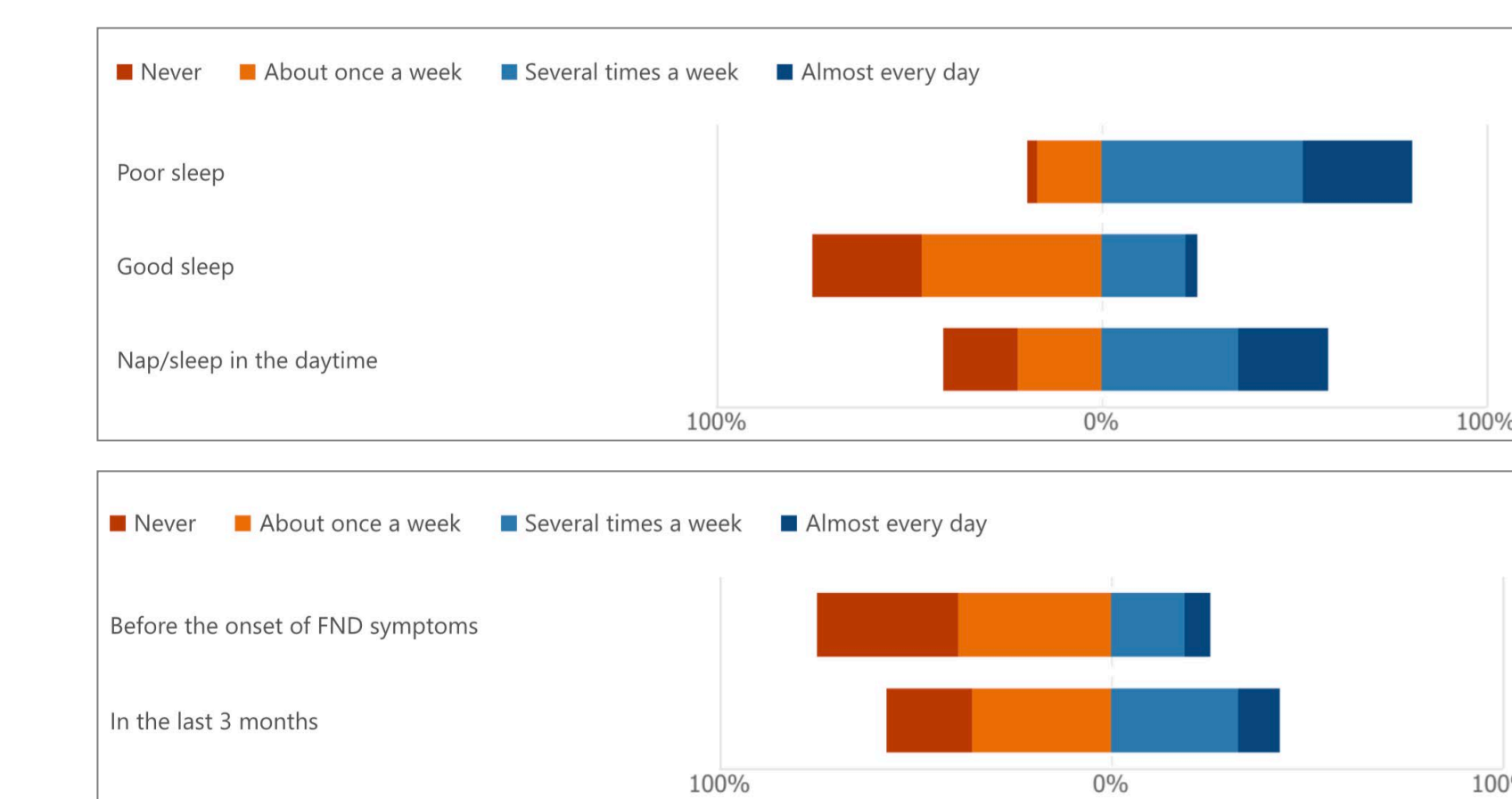
The frequency of good sleep / poor sleep / nap or sleep during daytime in the last 3 months (n=373)

### Negative dreams and Nightmares

- Nightmares at least 1/w (78.4%), compared to just 5.1% in the general population (Li et al., 2010).
- Negative dream content (71.9%).
- 58.5% had dreams related to FND symptoms.
- Do things in dreams that are unable to do in daily life (50%) (Walk/ run/ move normally (55.6 %)).

### Deterioration of sleep and dreams during FND

- From 'before the onset of FND symptoms' to 'the last 3 months', self-rated 'good' sleep quality decreased by 21.8%, and the prevalence of nightmares increased by 14%.



The self-rated sleep quality and nightmares frequency before the onset of FND symptoms and in the last 3 months.

### Symptoms change related to sleep

- Worsening of functional symptoms related to sleep (88.2%).

- Participants with frequent poor sleep were more likely to experience a variety of worsened changes ( $r = 0.261$ ,  $p < 0.001$ ).
- Symptom improvement after a good night's sleep (45.7%).
- Individuals with sleep-related symptom improvement had a higher chance of experiencing good sleep (OR = 1.87) and insomnia (OR = 2.32), and a lower likelihood of poor sleep (OR = 0.69) and other sleep disorders.

### Symptoms change related to dream

- At least 1/w dreams affecting mood (65%), 87.2% found nightmares distressing.
- Symptoms change following specific dreams or nightmares (28.4%), 99% were negative changes (worsening of seizures, pain, and fatigue), and 9.0% recognized FND-related dreams as potential triggers for starting FND symptoms after the FND onset.
- These changes were more common in participants with Nightmares (OR= 8.19).

	All	Subjects with DFC	Subjects with no DFC	Unadjusted OR (95% CI)
No. of subjects	306	87	219	
Negative dream content	189(61.8)	75(86.2)	114(52.1)	5.76(2.96-11.19)
Nightmare in the last 3 months	240(78.4)	83(95.4)	157(71.7)	8.19(2.88-23.31)
Nightmare distress	232(87.2)	83(95.4)	149(68.0)	18.38(2.47-136.85)
Functional seizure while dreaming	60(19.6)	26(29.9)	34(15.5)	2.32(1.29-4.17)
Functional seizure after sleep paralysis	59(19.3)	29(33.3)	30(13.7)	3.15(1.75-5.68)
Believe dreams connected to FND	103(33.7)	57(65.5)	46(21.0)	7.15(4.13-12.37)

Dream characteristics of participants with dream-related FND symptom change (DFC) compared to those without DFC.

### Obesity and sleep disorders

- High prevalence of obesity in the cohort (41%), However, formally diagnosed sleep breathing disorders were rare (7.8%) and much lower than found in a study specifically assessing sleep apnoea in FND (49%) (Nepožitek et al., 2023), and than expected in the general population with these rates of obesity (Resta et al., 2001).
- An association was found between obesity and three sleep disorders; sleep-related breathing disorder (OR = 3.60), insomnia (OR = 1.88), and movement disorders (OR = 1.58).

	All	Subjects with SFI	Subjects with no SFI	Unadjusted OR (95% CI)
No. of subjects	373	173	200	
Good self-rated sleep quality in the last 3 months	28(7.5)	17(9.8)	11(5.5)	1.87(0.85-4.12)
Sleep duration (6-10hrs)	192(51.5)	97(56.1)	95(25.5)	1.41(0.94-2.12)
Good sleep >= 1/w	266(71.3)	129(74.6)	137(36.7)	1.35(0.86-2.12)
Poor sleep >= 1/w	364(97.6)	168(97.1)	196(98.0)	0.69(0.18-2.60)
Insomnia	28(7.5)	17(54.8)	11(34.4)	2.32(0.84-6.4)
Sleep related breathing disorder	29(7.8)	12(6.9)	17(27.0)	0.56(0.21-1.52)
Sleep related Movement disorder	18(4.8)	7(4.0)	11(17.5)	0.56(0.18-1.7)
Sleep paralysis	167(44.8)	66(38.2)	101(27.1)	0.61(0.4-0.91)

Sleep characteristics of participants with sleep-related FND symptoms improvement (SFI) compared to those without sleep-related improvement.

## Conclusion

- Our findings support the common perception of poor sleep quality, nightmares, and negative dreams in FND patients.
- Further, we demonstrated that self-reported sleep and dream content may also influence symptoms of FND.
- Finally, we identify further areas of interest such as the role of specific, or recurrent dreams.
- There is likely also a large underdiagnosis of formal sleep disorders, which have established treatments. These findings together may help to encourage more treatments targeting sleep for FND patients.

## Acknowledgements

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