Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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The psychological impact of COVID-19 among a sample of Italian patients with functional neurological disorders: A preliminary study

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Since February 2020 the coronavirus disease 2019 (COVID-19) has rapidly spread worldwide, becoming a pandemic. Besides the physical consequences of the infection, several studies have already shown how COVID-19 itself and the strict lockdown ordered by local authorities greatly impact also on mental health, especially on individuals with pre-existing psychiatric conditions [1]. Although specific data are still not available, we hypothesized that patients affected by functional neurological disorders (FND, also called conversion disorders), characterized by the presence of neurological symptoms that cannot be explained by typical neurological diseases or other medical conditions, might be at particularly high risk. This hypothesis is sustained by previous research studies that showed how intense and ubiquitously felt stressors, such as acts of terrorism, can increase the frequency of FND and other somatic complaints or can worsen preexisting disorders [2,3]. Here we aimed to explore the prevalence of stress, anxiety, depression and symptoms related to post-traumatic stress disorder (PTSD) across a sample of patients with psychogenic non-epileptic seizures (PNES) and a sample of patients with functional movement disorders (FMD) during the first two months of COVID-19 pandemic in Italy, with respect to a sample of healthy controls (HC). We also aimed to assess patients' subjective perception of their FND and their general health through an ad hoc questionnaire designed for the study.

This was a cross-sectional study, using a survey online to administer questionnaires to participants.

Ten consecutive patients with FMD and eight with PNES were recruited, and they were compared to and eighteen HC. Data collection took place between 4th May and 8th May 2020. All participants signed an informed consent form. The study was approved by the ASST Santi Paolo e Carlo Ethics Committee. The survey included: (i) the Depression, Anxiety and Stress Scale – 21 items (DASS-21), (ii) the Impact of Event Scale-Revised (IES-R), (iii) the Perceived Stress Scale (PSS). Patients with FND also completed an ad hoc questionnaire including the questions reported in Supplementary material.

Statistical analysis was performed using SPSS version 26 (Statistical Package for Social Science).

Sociodemographic information, results at the psychometric scales and at the ad hoc questionnaire are reported in Table 1. Participants' answers to the ad hoc questionnaire are reported in Supplementary material.

This study showed that patients with FMD only presented significantly higher levels of anxiety, symptoms related to PTSD and perceived stress than HC during the first two months of COVID-19 pandemic in Italy. Although we do not have a pre-epidemic psychometric assessment of our participants, our data are in line with previous studies showing that patients with FMD are more keen to develop stress, anxiety and PTSD related symptoms than HC, particularly in stressful situations [4]. However, we found patients with PNES to behave similarly to HC rather than patients with FMD. This result might be biased by the small number of patients recruited or by some intrinsic features of patients with PNES rendering them different from FMD in the psychological response to a stressful event. However, the majority of patients reported their FND and their general health to have remained stable or to have even improved during the first two months of the COVID-19 pandemic. This result is surprising since previous studies showed how ubiquitously felt stressors have led to increases in FND after large-scale traumatic events [2,3,5]. The discrepancy observed between our results and previous studies might be due to different factors: first, differently from previous studies, the assessment performed here was conducted in the acute phase of the outbreak and not in the long-term; second, we used a subjective measure to assess functional symptoms (ad hoc questionnaire) and not an objective one; third, it is important to mention that the first two months of the COVID-19 pandemic in Italy overlapped with a strict lockdown of the entire population. The lockdown arguably represented a risk factor for the development of different mental health problems both in the general population and in subgroups of psychiatric patients. However, it is possible that specific populations of patients, such as alexithymic patients, those with difficulties with social interactions or those with comorbid anxiety, such as most individuals with FND, might have benefited from the lockdown, since they had not to face with external factors (e.g. comparison with colleagues or social relationships). However, patients who paradoxically benefit from the lockdown condition might be at high risk of sudden worsening of their symptoms during the period immediately after lockdown, when they are forced to come back to their pre-lockdown life condition.

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Table 1
Participants' sociodemographic and psychometric information.

		PNES	FMD	HC	Statistical Index*	p	Post-hoc
Age, mean (SD)		30.3 (13)	46.8 (17.6)	41.5 (14.9)	213.81 (2, 33)	0.084	N/A
gender, N (%)	M	0	3	3	2.88 (2)	0.237	N/A
	F	8	7	15			
COVID-19_diagnosis, N (%)	No	8 (100)	10 (100)	18 (100)	N/A	N/A	N/A
COVID-19_relatives, N (%)	No	14	0	7	N/A	N/A	N/A
	Yes and this person lived with me	0	0	0			
	Yes but this person did not live with me	4	0	1			
DASS-21 Total Score, mean (SD)		14.3 (14.1)	20.2 (15.4)	9.6 (5.7)	2.933 (2, 33)	0.067	FMD > HC (p = 0.064)
DASS-21 Stress, mean (SD)		6.1 (5.6)	8.2 (5.3)	5.3 (2.7)	1.461 (2, 33)	0.247	N/A
DASS-21 Stress, N (%)	Normal	6 (75)	6 (60)	14 (77.8)	N/A	N/A	N/A
	Mild	1 (12.5)	0	4 (22.2)			
	Moderate	0	0	0			
	Severe	0	4 (40)	0			
	Extremely severe	1 (12.5)	0	0			
DASS-21 Anxiety, mean (SD)		3.5 (2.5)	5.6 (4.5)	1.5 (1.8)	**6.362 (2, 33)**	**0.005**	**FMD > HC (p = 0.004)**
DASS-21 Anxiety, N (%)	Normal	5 (62.5)	3 (30)	14 (77.8)	N/A	N/A	N/A
	Mild	1 (12.5)	2 (20)	4 (22.2)			
	Moderate	1 (12.5)	1 (10)	0			
	Severe	1 (12.5)	1 (10)	0			
	Extremely severe	0	3 (30)	0			
DASS-21 Depression, mean (SD)		4.6 (7.1)	6.4 (6.8)	2.8 (2.3)	1.672 (2, 33)	0.203	N/A
DASS-21 Depression, N (%)	Normal	6 (75)	6 (60)	15 (83.3)	N/A	N/A	N/A
	Mild	0	1 (10)	1 (5.69			
	Moderate	1 (12.5)	1 (10)	2 (11.1)			
	Severe	0	0	0			
	Extremely severe	1 (12.5)	2 (20)	0			
IES-R Total Score, mean (SD)		13.5 (10.6)	24.7 (17.4)	10.3 (9.4)	**4.496** (2, 33)	**0.019**	**FMD > HC (p = 0.016)**
IES-R Total Score, N (%)	Normal	6 (75)	4 (40)	15 (83.3)	N/A	N/A	N/A
	Mild psychological impact	2 (25)	3 (30)	3 (16.7)			
	Moderate psychological impact	0	1 (10)	0			
	Severe psychological impact	0	2 (20)	0			
IES-R Avoidance, mean (SD)		0.7 (0.5)	1.1 (0.9)	0.5 (0.6)	2.386 (2, 33)	0.108	N/A
IES-R Intrusion, mean (SD)		0.5 (0.4)	1 (0.9)	0.5 (0.5)	2.879 (2, 33)	0.070	FMD > HC (p = 0.094)
IES-R Hyperarousal, mean (SD)		(0.7 (0.8)	1.4 (1)	0.4 (0.4)	**6.03** (2, 33)	**0.006**	**FMD > HC (p = 0.004)**
PSS, mean (SD)		16.6 (10.1)	21.9 (7.3)	13.8 (4.7)	**4.452** (2, 33)	**0.019**	**FMD > HC (p = 0.016)**
PSS, N (%)	Low stress	4 (50)	1 (10)	9 (50)	N/A	N/A	N/A
	Moderate stress	3 (37.5)	6 (60)	9 (50)			
	High stress	1 (12.5)	3 (30)	0			
Lockdown_FNS, N (%)	Much worsened	1 (12.5)	1 (10)	N/A	N/A	N/A	N/A
	Worsened	0	0	N/A			
	Stable	5 (62.5)	6 (60)	N/A			
	Improved	1 (12.5)	3 (30)	N/A			
	Much improved	1 (12.5)	0	N/A			
Lockdown_Global health, N (%)	Much worsened	0	1 (10)	N/A	N/A	N/A	N/A
	Worsened	1 (12.5)	3 (30)	N/A			
	Stable	4 (50)	3 (30)	N/A			
	Improved	3 (37.5)	3 (30)	N/A			
	Much improved	0	0	N/A			
Patients with new FNS, N (%)		1 (12.5)	2 (20)	N/A	N/A	N/A	N/A

Abbreviations: DASS-21 = Depression, Anxiety and Stress Scale – 21 items; HC = Healthy controls; FMD = Functional Movement Disorders; FNS = Functional Neurological Symptoms; IES-R = Impact of Event Scale-Revised; N = Numerosity; PNES: Psychogenic Non-Epileptic Seizures; PSS = Perceived Stress Scale; SD = Standard Deviation; N/A = Not Applicable; *Statistical Index: when Pearson Chi Square (χ^2) test was run (categorical variables), χ (df) is reported; when ANOVA was run (psychometric assessment), F (df, error) is reported – differences amongst groups were investigated through Bonferroni post-hoc analysis, and only significant differences were reported.

Author's role

Veronica Nisticò: Analyzed the data; drafted the manuscript for intellectual content.

Diana Goeta: Major role in the acquisition of data.

Orsola Gambini: Revised the manuscript for intellectual content

Benedetta Demartini: Design and conceptualized the study; interpreted the data; revised the manuscript for intellectual content.

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Declaration of competing interest

Authors have no conflict of interests to declare.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.parkreldis.2020.07.019.

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