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Fibromyalgia: heterogeneity in personality and psychopathology and its implications

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ABSTRACT

The fibromyalgia syndrome (FM) is a chronic widespread pain condition whose etiology remains unknown and no treatment has satisfactory levels of success. A meta-analysis has identified a distinct Minnesota Multiphasic Personality Inventory-2 (MMPI-2) clinical profile between FM female patients and healthy controls, and differences between FM and other chronic pain condition with clear etiology have also been found. However, heterogeneity in this population has been suggested in several studies. We aim to assess clinical aspects in FM patients, based on personality psychopathology characteristics, in order to explore heterogeneity and the existence of core common aspects. In this cross-sectional study, a relatively homogeneous sample of 56 female FM patients ($M_{age} = 45.95$, $SD_{age} = 9.39$) was assessed through MMPI-2. A K-Means cluster analysis identified two clusters, one ($n = 24$) with clinically significant levels in *Negative Emotionality* and *Introversion* scales. Subsequent MANOVAs identified important features of this cluster on several MMPI-2 dimensions. Moreover, several dimensions are clinically elevated in both clusters. In conclusion, the combination of psychopathological negative emotionality, interpersonal isolation, and low hedonic capacity, in a group of patients, has implications for the daily living and treatment of FM patients, and several core aspects of FM need to be addressed.

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Fibromyalgia (FM) is a syndrome characterized by chronic widespread pain, which is frequently associated with fatigue, sleep disorder, other functional somatic syndromes, mental and physical disorders, as well as disability and diminished quality of life. Although a central sensitization phenomena has been associated to FM (Ablin et al., 2012; Arnold et al., 2016) the etiopathology of FM remains unknown (Thieme, Mathys, & Turk, 2017). Some authors conceptualize this syndrome as part of a group of affective spectrum disorders (e.g., Arnold et al., 2004), as it has a high comorbidity with psychiatric disorders. In addition, a high prevalence of alexithymia has been found in FM patients (Di Tella et al., 2018). The fact that FM is a medically unexplained syndrome, and the quality of evidence of a large range of treatments for FM are only modest and has

not shown significant improvement over the past two decades (Thieme et al., 2017) presents a challenge to clinical psychology and its contribution to the understanding and treatment of FM.

In the scope of an integrative biopsychosocial approach to FM, psychological aspects may play an important role as predisposing factors to FM, and personality is one of those aspects (Eich, Hartmann, Muller, & Fischer, 2000; Malin & Littlejohn, 2012; Van Houdenhove, Luyten, & Egle, 2009). Within a diathesis-stress model of disease, some personality and psychopathology features that make people more vulnerable to stressors would be antecedent to FM, interacting with physiological vulnerabilities to the development of the syndrome (Thiagarajah, Guymier, Leech, & Littlejohn, 2014).

A recent meta-analysis focused on the Minnesota Multiphasic Personality Inventory (MMPI-2) has shown that female FM patients have a psychopathology profile significantly different than the profile of healthy volunteers (Novo, Gonzalez, Peres, & Aguiar, 2017a, 2017b). Nevertheless, it also acknowledged that the FM patients are probably a heterogeneous group regarding personality and psychopathology profiles.

Pertaining to psychopathology, with the original MMPI, Ahles, Yunus, Riley, Bradley, and Masi (1984) found a large group of FM patients with a clinical profile within the normal range, followed by a group with the typical chronic pain profile (clinically significant scores on the 'neurotic triad scales', i.e., hypochondriasis, depression and hysteria), and a smaller group with the psychopathological profile (significant elevations in several clinical scales) was found. On the contrary, some studies found a larger cluster with the psychopathological profile (Claros et al., 2006; Porter-Moffitt et al., 2006).

Pertaining to personality only, within the five factor model of personality, a cluster with higher Neuroticism and lower Conscientiousness is identified (Bucourt et al., 2018; Torres et al., 2013) and also with lower Extraversion (Torres et al., 2013) associated with more self-reported pain (Bucourt et al., 2018).

Finally, the distressed type or Type D personality, a specific combination of Negative Affectivity and Social Inhibition, has been more recently studied in this population, and it constitutes our main interest. Van Middendorp et al. (2016) found a high prevalence within an FM sample, and Ablin, Zohar, Zaraya-Blum, and Buskila (2016) found a higher prevalence of Type D personality in one of the FM clusters, associated with a less adaptive pattern.

In conclusion, we intend to explore heterogeneity based on structural personality psychopathology dimensions (as most of the studies focus on clinical psychopathology dimensions), within a community sample with a homogeneous age range. We hypothesize that different clinical levels in the psychopathology and personality dimensions will be found.

Method

Participants

The participants were 56 FM female patients between 30 and 60 years old ($M = 45.95$; $SD = 9.39$). The inclusion criteria were: Having a pure FM diagnosis (not having another rheumatic disease or painful condition) for at least six months. Finally, all the participants had the response consistency levels (VRIN and TRIN validity scales) within the normal range.

Instruments

We used MMPI-2 (Butcher, Dahlstrom, Graham, Tellegen, & Kaemmer, 1989) in a Portuguese version (Silva, Novo, Prazeres, & Pires, 2006), is a self-administered inventory to assess clinical and personality psychopathology. The results are converted into normalized T-scores, and in general terms, $T > 65$ are clinically significant. In clinical scales, internal consistency coefficients range between .34 and .87, most of them in .80.

Procedure

Most of the FM patients were recruited through a patient's association, contacted by telephone and asked about the inclusion criteria and availability to participate in the study. The remaining FM patients were recruited within the scope of a psychological assessment service in a university centre open to the community. Research with MMPI-2 was approved by the ethic committee of the North Lisbon Hospital Center. The informed consent was obtained and the privacy was observed in accordance with the principles of the Declaration of Helsinki.

Data analysis

We conducted K-means non-hierarchical cluster analysis, based on the five MMPI-2 personality psychopathology scales (PSY-5: *Agressiveness*, *Psychoticism*, *Disconstraint*, *Negative Emotionality/Neuroticism*, and *Introversion/Low Positive Emotionality*) testing a three clusters solution in the first place. As it was not appropriate, we tested a two clusters solution. We used Chi-Square test to identify the differences between the clusters in the sociodemographic nominal and ordinal variables and a one-way analysis of variance (ANOVA) to test the differences in age and diagnosis duration. We used multivariate analysis of variance (MANOVA) to test the differences between the two clusters in the MMPI-2 clinical scales.

Results

In the K-means two-cluster solution, based on the scores of the PSY-5 MMPI-2 scales, convergence was achieved after three iterations. The distance between final cluster centers was 23.945. The characterization features are presented in Table 1.

The larger cluster ($n = 32$) has no clinically significant elevation, and the other cluster ($n = 24$) has clinically significant elevations ($T \geq 65$) in two scales: *Negative Emotionality* ($M = 65.25$, $SD = 9.66$; $t = -3.38$; $p = .001$) and *Introversion* ($M = 68.38$, $SD = 9.90$; $t = -8.61$; $p = .000$ (Figure 1).

The MANOVA showed significant differences between the clusters in the composite of clinical scales (Wilk's $\Lambda = .415$; $F(10,45) = 6.344$; $p = .000$; $\eta^2_{\text{par}} = .585$). Both clusters had clinically significant elevations in *Hypochondriasis*, *Depression*, *Hysteria*, and *Schizophrenia* (Figure 2), and Cluster 2 also had it in *Psychasthenia* ($M = 69.63$, $SD = 8.99$; $t = -3.54$; $p = .001$).

Table 1. Sociodemographic characteristics of FM participants.

	Cluster 1		Cluster 2		<i>F</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Age	44.38	9.34	48.04	9.22	2.14	.250
Diagnosis Duration	4.98	2.56	5.78	3.66	.896	.348
	<i>N</i>	%	<i>N</i>	%	χ^2	<i>p</i>
Marital Status					2.21	.331
Single	5	15.6	2	8.3		
Married/cohabiting	21	65.6	20	83.3		
Divorced/separated	6	18.8	2	8.3		
Educational level					5.65	.464
1 st cycle	0	0	2	8.3		
2 nd cycle	2	6.3	2	8.3		
3 rd cycle	3	9.4	4	16.7		
Secondary	12	37.5	7	29.2		
Bachelor	1	3.1	2	8.3		
University graduation	12	37.5	5	20.8		
Master	2	6.3	2	8.3		
Occupational status					2.34	.505
Working	22	68.8	15	62.5		
Unemployed	4	12.5	1	4.2		
Retired	4	12.5	5	20.8		
Other	2	6.3	3	12.5		

Note. Cluster 1 (*n* = 32); Cluster 2 (*n* = 24).

Figure 1. Personality Psychopathology Five Scales (PSY-5) profiles for clusters 1 and 2.

Note. AGGR = Agressiveness; PSYC = Psychoticism; DISC = Disconstraint; NEGE = Negative Emotionality/Neuroticism; INTR = Introversion/Low Positive Emotionality.

Discussion

As hypothesized, we found different clinical levels in the psychopathology and personality dimensions of FM patients, organized in two clusters. One of them (cluster 2) is in line with Type D personality found by Ablin et al. (2016), and it is relevant that this cluster has higher *Introversion* mean levels than the *Neuroticism* ones. As the presence of positive affect protects against the experiencing of negative affect in times of stress and pain (Davis, Zautra, & Smith, 2004), this protective aspect is absent in this cluster. As Vendrig, Derksen, and Mey (2000) found that pretreatment higher scores in Introversion predicted decreased satisfaction with the treatment, decreased self-perceived emotional

Figure 2. MMPI-2 clinical profiles for clusters 1 and 2.

Note. Hs = *Hypochondriasis*; D = *Depression*; Hy = *Hysteria*; Pd = *Psychopathic Deviate*; Mf = *Masculinity/Femininity*; Pa = *Paranoia*; Pt = *Psychasthenia*; Sc = *Schizophrenia*; Ma = *Hypomania*; Si = *Social Introversion*.

change, and a probability of investing less energy in the treatment process, this could be a relevant implication to any intervention with these patients.

Cluster 2 has an extremely high mean level of *Depression*, as the most elevated scale of the neurotic triad, a configuration that does not characterize chronic pain patients in general, as *Hypochondriasis* and *Hysteria* are usually the more elevated scales in these patients (Ahles et al., 1984; Claros et al., 2006; Keller & Butcher, 1991; Porter-Moffitt et al., 2006). Cluster 2 has also clinically significant levels of *Psychasthenia*, which corresponds to a diagnosis close to Obsessive-Compulsive Disorder (Graham, 2012).

Apart from heterogeneity, we identified common features of the FM patients. Both clusters have clinically significant levels in the neurotic triad, and in *Schizophrenia*, reflecting a pathological clinical profile, predominantly neurotic but also reflecting social alienation, unusual beliefs, confusion and lack of adequacy, which differentiates FM from other chronic pain samples, in which the neurotic triad only is expected to be elevated (e.g., Keller & Butcher, 1991).

A group of FM patients have relevant personality, clinical and specific features that undoubtedly may compromise any regular chronic pain treatment. This personality pattern has a double implication, at both emotional and relational level, as high Negative Emotionality hinders relations with others, and high Introversion leads to emotional and social disengagement (Friedman, Lewak, Nichols, & Webb, 2001). Beyond heterogeneity, affective distress is a common aspect to the sample and it should require psychological intervention as part of any medical intervention.

This work has some limitations, mainly the sample dimension, and the absence of a control group. The fact that the sample is composed by women only makes the interpretations appropriate to female fibromyalgia patients only. As strengths of the study, we aimed for a FM community sample, with a homogeneous age range and, to our best knowledge, it is also the first study exploring the heterogeneity in the clinical and

psychopathological symptomatology in FM patients, based exclusively on structural and relatively stable personality characteristics.

In future research it would be important to study the adherence of FM patients to medical and psychological interventions, the treatment results, and relate them to the personality and psychopathology features.

Disclosure statement

No potential conflict of interest was reported by the authors.

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