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Fibromyalgia and Personality

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Resumo

Introdução: A fibromialgia é uma doença caracterizada por dor crónica generalizada sem causa orgânica aparente, frequentemente associada a outros sintomas debilitantes, sendo fonte de grande sofrimento e de forte impacto económico. A sua etiologia permanece indeterminada, com alguns estudos a sugerir causas psicológicas e psiquiátricas.

Objectivos: Este estudo pretende avaliar eventuais diferenças de perfil de personalidade (de acordo com o Modelo dos 5 Grandes Factores) entre pacientes e as suas irmãs sem a doença, com o objectivo de definir factores que possam estar relacionados com os mecanismos de desenvolvimento desta patologia e das comorbilidades associadas.

Metodologia: 21 díades familiares, compostas por uma doente com fibromialgia e a sua irmã saudável, responderam ao questionário "Revised NEO Personal Inventory – versão portuguesa", enquanto parte do projecto conjunto ScanFM.

Resultados: Foram encontradas diferenças estatisticamente significativas entre os 2 grupos, apresentando as doentes com fibromialgia níveis mais elevados de Neuroticismo e Amabilidade. Ao nível das facetas, as doentes mostraram, com significado estatístico, níveis mais altos de N1 (Ansiedade), N2 (Hostilidade), N3 (Depressão), N6 (Vulnerabilidade) e A5 (Modéstia) e mais baixos de E3 (Assertividade).

Conclusões: As doentes com fibromialgia apresentam diferenças estatisticamente significativas em traços e facetas de personalidade, que podem estar relacionados com algumas características clínicas e fisiopatológicas da fibromialgia, dando motivos para estudos mais aprofundados destes factores.

Palavras-chave: Fibromialgia, Personalidade, NEO-PI-R, Neuroticismo, Modelo dos 5 factores, Extroversão, Depressão.

Abstract

Introduction: Fibromyalgia is characterized by the presence of generalized and chronic pain without apparent organic explanation, often associated with other disruptive symptoms, causing great suffering and impacting a significant economic burden. Its etiology remains undetermined. Some studies suggest psychological and psychiatric factors to be the underlying cause.

Objectives: This study aims to evaluate the differences in personality profiles (according to the Big Five Model of personality) between fibromyalgic patients and their unaffected sisters, in order to search for factors that can be related with the mechanisms underlying this condition and its related comorbidites.

Methods: 21 family dyads, composed of a fibromyalgic patient paired with her unaffected sister, answered to the Portuguese version of the "Revised NEO Personal Inventory", as a part of the joint ScanFM project.

Results: Statistically significant differences were found between the two groups, with fibromyalgic presenting higher scores of Neuroticism and Agreeableness. At the level of the facets, the patients showed, with statistical significance, higher scores of N1 (Ansiety), N2 (Hostility), N3 (Depression), N6 (Vulnerability) and A5 (Modesty) and lower scores of E3 (Assertiveness).

Conclusions: Fibromyalgic patients presented statistical significant differences in certain traits and facets, that may be related with fibromyalgic clinical and physiopatological characteristics. These findings deserve further and deeper study.

Palavras-chave: Fibromyalgia, Personality, NEO-PI-R, Neuroticism, Big Five Model, Extraversion, Depression.

Introduction

According to the criteria of American College of Rheumatology, fibromyalgia (FM) is a condition defined by the presence of generalized chronic pain (in all four major quadrants of the body and the axial skeleton for at least 3 months) in addition to demonstrable tenderness evoked by 4kg of manual thumb pressure in at least 11 of 18 predefined tender points^[1]. It is also marked by multiple symptoms, including fatigue, sleep disturbances, cognitive dysfunction and depressive episodes^[2]. These features cause a lot of suffering and impairment in daily life and make it an enormous economic burden It has been estimated that FM has annual incremental costs of up to approximately €12 billion for a population of 80 million^[3].

Fibromyalgia is recognized as a common condition in the clinic and a major cause of morbidity worldwide. Its prevalence is estimated to be about 3,6% in Portuguese population^[4], being one of the most frequent diagnosis in the rheumatologic practice.^[5] It affects mostly women, with a female-to-male ratio of approximately 9:1.^[6] The syndrome predominantly affects middle aged women, and females usually present a richer symptomatology and a greater number of tender points than men.^[5]

Its etiology remains unknown, although some biological mechanisms have been proposed to mediate the condition^[7-8]. Genetic^[9], hormonal^[10], neurological^[11-12], psychiatric and psychological^[13] factors have been implied. Fibromyalgia resembles has been suggested to be a manifestation of hysteria^[14], depression^[15], or affective spectrum disorder^[16]. Indeed, FM patients show a significantly higher prevalence of depressive and anxiety disorders, reported in 20-80% and 13-68% of cases, respectively^[17]. On the other hand, others have asserted that fibromyalgia has no psychiatric roots^[18], rather developping as a response to an overactive lifestyle^[19] in the absence of psychological factors^[20].

Cognitive behavioural therapy and antidepressant drugs are useful in the treatment of FM, suggesting a link between fibromyalgia and psychiatric, psychological and behavioral factors.^[17] Almost 30 years have passed since the publication of the first study associating

psychological factors with fibromyalgia^[21]. Since then, many studies have found correlation between fibromyalgia and harm avoidance^[6], catastrophizing^[22], hypervigilance^[23], altered cognitive capacities^[24] and higher prevalence of psychiatric disorders^[18], which led to the concept of "psychogenic rheumatism".^[25] Some studies have suggested the hypothesis of a predisposing personality.^[26]

Personality can be defined as a dynamic and organized set of characteristics possessed by a person that uniquely influences his or her cognitions, motivations, and behaviors in various situations. The five factor model of personality proposes a hierarchical organization of personality traits in terms of five basic dimensions (each with 6 facets): Extraversion (E), Agreeableness (A), Conscientiousness (C), Neuroticism (N) and Openness to Experience (O).^[27] These can be assessed by the Revised NEO Personal Inventory (NEO-PI-R), which has been validated to the Portuguese population.^[28] The five over-arching domains have been found to contain and subsume most known personality traits and are assumed to represent the basic structure behind all personality profiles. They provide a rich conceptual framework for integrating all the research findings and theories in personality psychology. Several contemporary authors think that, despite some limitations, this model is one of the most valid personality models to explore the relation between personality and physical and mental health.^[29-30] For a better understanding of these traits and facets consult Appendix 2.

In this paper we aim to study the differences in personality traits and facets between FM patients and their non-affected sisters, in order to evaluate the possibility of a relation between personality and that condition.

Methods

In order to maximize the efficiency of the whole investigation, this study was conducted in partnership with other colleagues, as part of a project called ScanFM. Each of the investigators involved conducted their own study on fibromyalgia, but all data was cooperatively gathered from the same population on a single occasion.

We decided to study female patients with fibromyalgia paired with their mother and an unaffected sister, in order to minimize the impact of socio-cultural confounders. Participants were drawn from a list of 712 patients with an established diagnosis of FM from a single site (all diagnosed and followed by Prof. J.A.P. da Silva). The following criteria were used to screen patients for the study: Female gender, age between 18 and 55 years, absence of any other chronic pain condition, residence within an radius of 100 Km from the study centre.

Selected patients were contacted by phone and invited to participate if i) they had at least one unaffected sister, ii) the mother of both was the same person, still alive and capable of participating and providing reliable information, and iii) all these family members were willing to travel to the research site and participate in the study, which involved signing an informed consent, responding to questionnaires, providing a blood sample and undergoing physical examination. Participants were reimbursed for transportation costs but no other compensations were offered. The study was approved by Ethical Committee of the Faculty of Medicine of the Universidade de Coimbra.

All research proceedings were performed in the morning. After receiving an explanation of the study procedures and having an opportunity to present any questions and discuss all issues, participants signed an informed consent form. This was followed by a fasting blood sample collection. Breakfast was offered to participants before following with the procedures.

Besides a custom demographic questionnaire, this paper made use of the validated Portuguese translation of the Revised NEO Personality Inventory (NEO-PI-R) – Appendix 2.

This is a self-report questionnaire designed to measure the five major domains of personality as well as the more specific six facets incorporated in each domain. It is composed of 240 questions consisting of statements about one self's perceptions and feelings, to be scored in a five-point Likert item format (Strongly disagree, Disagree, Neither agree nor disagree, Agree, Strongly agree). Each trait had a set of 8 questions (all mixed up and some of them with inverted scoring), and the total score was obtained by the sum of the points for each question, with a possible range of 0 to 32. Each trait was calculated by the sum of its facets scores. The Cronbach's α for the translated version was of 0,85 in the validation study. The questionnaire was sent to the patients and their sisters and collected at their arrival to the research site.

Statistical Analysis

Results were analyzed using PASW Statistics 18. Participants were paired according to the family. Exploratory data analysis (by Kolmogorov-Smirnov test) showed that the normal distribution required for parametric testing was not met for all comparisons. Therefore, the hypothesis of a difference in personality traits and facets between patients with FM and unaffected sisters was tested with a Wilcoxon signed-rank test for N4 (Self-consciousness), E1 (Warmth), E5 (Excitement seeking), O1 (Fantasy), O2 (Aesthetics), O6 (Values), A1 (Trust), C1 (Competence), C5 (Self-discipline) and C (variables that didn't have a normal distribution) and with a paired two-sample Student's t-test for the rest of the variables.

Results

Population

The screening criteria used reduced the potential population to 317 individuals, which were contacted by phone. Of these, 278 were excluded for the following reasons: 121 did not have an unaffected sister, 27 had their sister living too far away to attend, 73 were already orphans or their mother was not capable of participating, 57 were not reachable through the phone. Of the remaining 39 families satisfying inclusion criteria, 11 refused to participate and 6 never made themselves available to attend the research centre.

Altogether, 22 family triads, composed of a fibromyalgia patient, one unaffected sister and the mother of both were included in the study. One of the patient's sister was found to satisfy criteria for classification of FM, thus leaving for comparison only 21 matched FM – healthy pairs, the sample analyzed in this paper. The demographic characteristics of the 21 families are presented in table I.

Table I – Demographic characteristics of the sample in study.

\mathcal{E}_{-1}			
		FM patients	Sisters
Age	Mean (SD)	40,9 (10,3)	40,1 (10,3)
(years)	Range	18,7 - 55,0	19,5 – 52,5
Formal education	Mean (SD)	12,6 (4,2)	12,1 (5,4)
(years)	Range	5 - 21	4 - 24
	Single	4 (19,0%)	7 (33,3%)
Marital status	Married	17 (81,0%)	12 (57,1%)
	Divorced	0 (0%)	2 (9,5%)
	Employed	14(66,7%)	14 (63,6%)
Professional	Self-employed	4 (19,0%)	1 (4,8%)
activity	Unemployed	2 (9,5%)	2 (9,5%)
	Student	1 (4,8%)	3 (14,3%)
	Unknown	0 (0%)	1 (4,8%)

Personality traits

The results are summarized in tables II to VI. Each corresponds to a trait and the respective facets: table II to Neuroticism, table III to Extraversion, table IV to Openness to

Experiences, table V to Conscientiousness and table VI to Agreeableness. In each line, "A" stands for FM patients and "B" to their unaffected sisters. Each table shows the mean for each facet or trait in the sample (and the respective standard-deviations), the mean of the differences (and the respective standard-deviation). The last column of the table shows the statistical significance (p<0,05 in bold) of the comparison between "A" and "B", obtained by statistical analysis either by paired-sample Student's t-test or by Wilcoxon signed-rank test.

Neuroticism

Significantly higher global scores of neuroticism (difference of 20,81; p=0,003) were found in the FM patients (table II). The difference was significant in facets Anxiety (p<0,001), Angry Hostility (p=0,021), Depression (p=0,013) and Vulnerability (p=0,005). They also showed a strong trend towards higher scores in Self-consciousness (p=0,069), but not in Impulsiveness.

Table II – Results for Neuroticism and its facets.

			Paired t-student			
	Mean (SD) Mean		Mean Difference (SD)	Sig. (2-tailed)		
Anxiety	A	25,86 (3,54)	5 (5 (5 50)	.0.001		
(N1)	В	20,19 (4,80)	5,67 (5,70)	<0,001		
	A	17,33 (3,85)				
Angry Hostility (N2)	В	14,10 (4,36)	3,24 (5,93)	0,021		
Depression	A	21,62 (5,64)				
(N3)	В	17,14 (5,06)	4,48 (7,52)	0,013		
Self-consciousness	A	18,86 (4,33)				
(N4)*	В	16,19 (4,50)	2,67 (6,23)	0,069*		
	A	18,29 (5,06)				
Impulsiveness (N5)	В	17,62 (5,99)	0,67 (5,63)	0,583		
Vulnerability	A	17,52 (5,38)				
(N6)	В	13,43 (3,64)	4,10 (5,93)	0,005		
Neuroticism	A	119,48 (21,18)				
(N)	В	98,67 (22,11)	20,81 (28,68)	0,003		

^{* :} Results for thus facet were obtained with Wilcoxon signed-rank test.

Extraversion

No significant difference was found for global Extraversion scores (table III). However, a significant difference was found in Assertiveness, with FM patients showing lower scores. In addition, FM patients showed an almost significant tendency for higher scores of Activity (p=0,056) and lower scores of Positive Emotions (p=0,077).

Table III – Results for Extraversion and its facets.

Table III Results to	LAHUV	ersion and its facets.					
			Paired t-student				
		Mean (SD)	Mean Difference (SD)	Sig. (2-tailed)			
	A	22,48 (4,27)					
Warmth (E1)*	В	22,00 (2,57)	0,48 (5,77)	0,667*			
	A	14,71 (5,26)					
Gregariousness (E2)	В	16,62 (4,79)	-1,91 (8,15)	0,297			
	A	13.81 (4,12)					
Assertiveness (E3)	В	15,19 (3,86)	-1,38 (2,99)	0,047			
	A	19,24 (4,73)					
Activity (E4)	В	17,19 (2,94)	2,05 (4,63)	0,056			
Excitement seeking	A	15,38 (4,91)					
(E5)*	В	16,14 (4,91)	-0,76 (5,26)	0,368*			
Positive emotions	A	18,19 (6,11)					
(E6)	В	20,95 (4,06)	-2,76 (6,79)	0,077			
Extraversion	A	103,81 (21,81)					
(E)	В	108,10 (15,53)	-4,29 (23,23)	0,408			

^{* :} Results for thus facet were obtained with Wilcoxon signed-rank test.

Openness to Experience and Conscientiousness

No significant difference was found either in both Openness to Experience or Conscientiousness traits. None of the respective facets presented significant differences (tables IV and V). Only Feelings, a facet of Openness to Experience presented a suggestive trend for higher scores in FM (p=0,073).

Table IV – Results for Openness to Experience and its facets.

	•	mess to Experience and its	Paired t-student			
	Mean (SD)		Mean Difference	Sig. (2-tailed)		
Fautan		10.00 (4.02)	(SD)			
Fantasy	Α	18,00 (4,83)	-0,05 (6,14)	0,861*		
(O1)*	В	18,05 (5,23)				
Aesthetics	A	19,71 (5,99)	1.40 (6.45)	0.250*		
(O2)*	В	18,24 (4,89)	1,48 (6,45)	0,359*		
Feelings	A	21,19 (3,94)	1.01.(4.20)	0.072		
(O3)	В	19,38 (3,40)	1,81 (4,38)	0,073		
Actions	A	16,14 (4,35)	0.14 (4.00)	0,897		
(O4)	В	16,29 (3,66)	-0,14 (4,99)	0,897		
Ideas	A	17,29 (4,89)	0.71 (6.24)	0.606		
(O5)	В	16,57 (6,26)	0,71 (6,24)	0,606		
Values	A	19,95 (3,25)	0.71 (2.22)	0.210*		
(O6)*	В	19,24 (2,95)	0,71 (3,23)	0,219*		
Openness to	A	112,29 (21,28)	4.52 (21.00)	0.257		
Experience (O)	В	107,76 (20,33)	4,52 (21,98)	0,357		

^{*:} Results for thus facet were obtained with Wilcoxon signed-rank test.

Table V – Results for Conscientiousness and its facets.

Table V Results It	<i>-</i>	icitiousiiess and its facets	•		
			Paired t-stu	ident	
		Mean (SD)	Mean Difference	Sig. (2-tailed)	
			(SD)	Sig. (2-tailed)	
Competence	A	20,38 (3,65)	0.57 (4.12)	0.560*	
(C1)*	В	20,95 (3,20)	-0,57 (4,13)	0,569*	
Order	A	21,76 (4,65)	1 67 (5 29)	0.162	
(C2)	В	20,10 (4,99)	1,67 (5,28)	0,163	
Dutifulness	A	24,33 (3,10)	1,00 (4,45)	0.215	
(C3)	В	23,33 (2,76)	1,00 (4,43)	0,315	
Achieve Striving	A	20,86 (4,45)	1,10 (4,68)	0,296	
(C4)	В	19,76 (3,42)	1,10 (4,08)	0,290	
Self-discipline	A	18,24 (3,85)	1 14 (4 20)	0,230*	
(C5)*	В	19,38 (3,65)	-1,14 (4,29)	0,230	
Deliberation	A	17,52 (5,68)	0.10 ((.09)	0.002	
(C6)	В	17,33 (5,70)	0,19 (6,98)	0,902	
Conscientuosness	A	123,10 (17,05)	2 24 (20 05)	0.702*	
(C)*	В	120,86 (16,87)	2,24 (20,05)	0,702*	

^{*:} Results for thus facet were obtained with Wilcoxon signed-rank test.

<u>Agreeableness</u>

The global Agreeableness score was significantly higher in FM patients (p=0,027; table VI). FM patients presented higher scores than their siblings in all of its facets, although this only reached statistical significance in Modesty (p=0,026).

Table VI – Results for Agreeableness and its facets.

Table VI – Results for Agreeableness and its facets.					
			Paired t-stu	ident	
		Mean (SD)	Mean Difference	Gi - (2 (-11-4)	
			(SD)	Sig. (2-tailed)	
Trust	A	18,24 (4,64)	0,33 (6,94)	0,778*	
(A1)*	В	17,90 (4,82)	0,33 (0,94)	0,778	
Straightforwardnes	A	21,14 (4,69)	1 42 (5 10)	0.222	
s (A2)	В	19,71 (4,03)	1,43 (5,19)	0,222	
Altruism	A	21,19 (3,94)	1 01 (4 20)	0.072	
(A3)	В	19,38 (3,40)	1,81 (4,38)	0,073	
Compliance	A	19,05 (4,53)	0,67 (4,14)	0,469	
(A4)	В	18,38 (4,48)	0,07 (4,14)	0,409	
Modesty	A	22,86 (3,51)	2.52 (4.92)	0.027	
(A5)	В	20,33 (3,01)	2,52 (4,82)	0,026	
Tender-mindedness	A	23,38 (4,32)	0.96 (4.01)	0.422	
(A6)	В	22,52 (2,98)	0,86 (4,91)	0,433	
Agreeableness	A	125,86 (15,34)	7.62 (14.65)	0.025	
(A)	В	118,24 (8,29)	7,62 (14,65)	0,027	

^{*:} Results for thus facet were obtained with Wilcoxon signed-rank test.

Discussion

This study examines the differences in personality profiles between FM patients and their unaffected sisters. The use of sibling pairs intends to reduce background confounders, including those related to socio-economic and genetic factors.

In our study, FM patients show significantly higher scores of Neuroticism (N), Anxiety (N1), Angry Hostility (N2), Depression (N3), Vulnerability (N4), Agreeableness (A), Modesty (A5) and lower scores of Assertiveness (E3) – tables II to VI.

There is considerable theoretical and experimental evidence that Neuroticism and Extraversion represent the primary manifestations in personality of sensitivity to reward and sensitivity to threat and punishment, respectively. Neuroimaging and psychopharmacological studies have demonstrated that these traits are supported by specific neuro-circuitries in the brain. [31].

Neuroticism, sometimes called emotional instability, is linked to the tendency to experience negative emotions and a low tolerance for stress or aversive stimuli. [31] Neurotics show greater distress and depressive symptomatology following stressful life events, such as unemployment, spousal caregiving, and breast cancer surgery. In laboratory settings, people with higher levels of neuroticism are more sensitive to negative mood inductions than are emotionally stable individuals. [32] These characteristics are consistent with the high levels of stress, negative emotions and paucity of positive emotions described in FM patients.

Some studies indicate that negative emotions amplify pain in women with and without FM.^[33] It has been reported that an approximately 50% lower stimulus intensity is needed to evoke a pain response in patients with FM compared with normal controls.^[34] The increased sensitivity to negative emotions associated with Neuroticism could, thus, predispose to central amplification of pain, a mechanism that is thought to play a major role in FM.^[35]

High Neuroticism has also been implicated in the development of stress-induced disorders, such as depressive and anxious disorders.^[17] So, high neuroticism can also be a

predisposing factor to the high frequency of such comorbidities in patients with FM. Our observations of higher global scores of Neuroticism is in agreement with previous studies.^[5, 36]

Significantly higher scores of Anxiety (N1), Depression (N3) and Vulnerabilty (N6) were found among our FM patients. An enhanced susceptibility and even propensity to stress is a common denominator of these facets. Stress alone is an important predisponent to pain^[37], but a tendency to other negative emotions (and the aforementioned consequences) is also present. In addition, these facets can be linked with the depressive and anxious disorders that frequently escort FM.

It has been reported that the perception or presence of social support attenuates pain perception^[38]. Higher scores of hostility (N2) were found in FM patients. It can be hypothesized that hostility contributes to lower actual or perceived social support and may, therefore, contribute to higher pain perception. Social rejection has been linked with higher sensitivity to pain.^[38]

On the contrary, Extraversion is linked to a tendency to experience positive emotions, which typically stem from experiences of reward or the promise of reward. Extraversion encompasses an array of facets, such as assertiveness, gregariousness, and warmth, that appear to feed sensitivity to reward.^[31] It has been reported that FM patients show lower global scores of Extraversion^[39]. This wasn't confirmed by our observations for the trait but significant differences or trents were found for some of its facets: lower levels of Assertiveness (E3), and nearly significant higher scores of Activity (E4) and lower scores of Positive Emotions (E6). So, on average, FM patients seems to lead more active lives than their sisters and experience higher difficulties in asserting themselves and experiencing positive emotions.

Negative emotions amplify pain^[33]. Experiencing positive emotions acts in the opposite direction. Evidence suggests an association between Positive Emotions and

decreased pain^[40] and anxiety^[41]. Thus, a lower score in Positive Emotions (E6) could act as a risk factor to generalized pain.

It seems reasonable to hypothesize that difficulties in affirming one self (Assertiveness - E3)^[42] and a more hectic pace of life (Activity – E4) may contribute to stress, that is closely related to pain.^[43]

Openness reflects the tendency to process abstract and perceptual information flexibly and effectively, and includes traits such as imagination, intellectual engagement, and aesthetic interest.^[31] Globally, no significant difference was found in this trait. However, among its facets, Feelings (O3) was near the limit of statistical significance, with FM patients showing a tendency to higher scores on this facet. Again, as the patients have a predominance of negative emotions, ruminating on them could contribute to amplified pain.

Agreeableness involves the humane resonance aspects of personality - characteristics such as altruism, nurturance, caring, and emotional support lye at one end of the dimension, while hostility, indifference to others, self-centeredness, spitefulness, and jealousy are at the other. Agreeableness showed a significant difference between groups, with FM patients presenting higher scores. This suggests that FM patients take others' suffering more personally than their normal counterparts. Again, in the absence of appropriate balances and compensations, this increased compassion may result in additional negative emotions contributing towards amplified pain.

FM patients showed higher scores in Modesty (A5). Modesty has been linked with low generativity^[44]. We could hypothesize that low generativity brings negative emotions, such as a lack of fulfillness, and less social involvement, that predispose to higher levels of pain.

Conscientiousness is a tendency to show self-discipline, act dutifully and thoroughly, and aim for achievement against measures or outside expectations. The trait shows a preference for planned rather than spontaneous behavior. It influences the way in which we

control, regulate, and direct our impulses^[27]. No significant differences were found neither in this trait nor in its facets.

This study has to be interpreted in light of several limitations. The reduced sample size is certainly relevant. However, the advantages of having a paired population with similar social and familial background, allowing for paired samples analysis can go a long way to diminish the negative impact of small numbers. Other possible cause of bias is the large range of ages of the sample, possibly including personalities not completely formed, although the results of cross-sectional studies demonstrate that the mean levels of Neuroticism, Extraversion, Agreeableness, and Conscientiousness among adolescents resemble quite closely the respective scores of the adult population and only self-reported scores of Openness seem to be lower during adolescence than during adulthood. However, interesting results were found, claiming for further study.

Conclusions

In this study, FM patients showed high scores on the traits of Neuroticism and Agreeableness than their healthy sisters. Among the facets, they showed high Anxiety (N1), Angry Hostility (N2), Depression (N3), Vulnerability (N6) and Modesty (A5) and low Assertiveness (E3).

These findings enable the drafting of a fibromyalgic personality that may have implications on its pathophysiology, though enhancement of pain by negative emotions and stress. In addition, this personality profile has been associated with a higher risk for psychiatric disorders often seen as comorbid conditions in these patients.

Further studies with larger patient samples and/or a prospective design are warranted to further scrutinize a possible personality profile favouring the development of FM and to allow a better understanding of the pathophysiological implications of such a profile.

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Appendix 1

Appendix 1 – Definition of the Big Five Model's facets.

	tion of the Big Five Model			
Trait	Facets	Definition		
	N1 - Anxiety	level of free floating anxiety		
	N2 – Angry Hostility	tendency to experience anger and related		
	1.2 ringly mostility	states such as frustration and bitterness		
Neuroticism	N3 – Depression	tendency to experience feelings of guilt,		
		sadness, despondency and loneliness		
(N)	N4 – Self-Consciousness	shyness or social anxiety		
	N5 – Impulsiveness	tendency to act on cravings and urges rather		
		than reining them in and delaying gratification		
	N6 - Vulnerability	general susceptibility to stress		
TE 4	E1 – Warmth	interest in and friendliness towards others		
Extraversion	E2 – Gregariousness	preference for the company of others		
	E3 – Assertiveness	social ascendancy and forcefulness of		
(E)		expression		
	E4 – Activity	pace of living		
	E5 – Excitement Seeking	need for environmental stimulation		
	E6 – Positive Emotion	tendency to experience positive emotions		
	O1 – Fantasy	receptivity to the inner world of imagination		
	O2 – Aesthetics	appreciation of art and beauty		
Openness to	O3 – Feelings	to inner feelings and emotions		
Experience	O4 – Actions	openness to new experiences on a practical level		
(O)	O5 – Ideas	intellectual curiosity		
	O6 – Values	readiness to re-examine own values and those		
	00 – Values	of authority figures		
	C1 – Competence	belief in own self efficacy		
	C2 – Order	personal organization		
	C3 – Dutifulness	emphasis placed on importance of fulfilling moral obligations		
Conscientiousness	C4 – Achievement	need for personal achievement and sense of		
(C)	striving	direction		
		capacity to begin tasks and follow through to		
	C5 – Self Discipline	completion despite boredom or distractions.		
	CC Daliband	tendency to think things through before acting		
	C6 – Deliberation	or speaking.		
	A.1 Trust	belief in the sincerity and good intentions of		
	A1 – Trust	others		
Agreeableness	A2 – Straightforwardness	frankness in expression		
Agrecablelless	A3 – Altruism	active concern for the welfare of others		
(4)	A4 – Compliance	response to interpersonal conflict		
(A)	A5 – Modesty	tendency to play down own achievements and be humble		
	A6 – Tender mindedness	attitude of sympathy for others		
	110 I officer filling carroom	average of Sympathy for Official		

Appendix 2





INSTRUÇÕES DE PREENCHIMENTO Este questionário é confidencial e para uso Este questionário vai ser submetido a leitur Por favor use tinta preta ou azul evitando t caixas.	a óptica.		Preench	assim assim não	Z C
Iniciais: Data de nascimento://		8 J	DF-	CODIFICA DAS RESPO Discordo F D-Disco N-Neutr C-Conco	OSTAS Fortemente rdo ro rdo
ITEM	DF	D	N	С	CF
Não sou uma pessoa preocupada					
Gosto mesmo da maioria das pessoas que encontro					
Tenho uma imaginação muito activa					
Tendo a ser descrente ou a duvidar das boas intenções dos outros					
Sou conhecido(a) pela minha prudência e bom senso					
Muitas vezes, aborrece-me a maneira como as pessoas me tratam					
Não gosto de multidões, por isso as evito					
Não dou grande importância às coisas da arte e da beleza					
Não sou matreiro(a) nem espertalhão (espertalhona)					
Antes quero deixar as coisas em aberto que planear tudo, com antecedênci	a 🗆				
Raramente me sinto só ou abatido(a)					
Sou dominador(a), cheio(a) de força e combativo(a)					
Sem emoções fortes, a vida não teria interesse para mim					
Algumas pessoas pensam que sou invejoso(a) e egoísta					
Tento realizar conscienciosamente todas as minhas obrigações					
Ao lidar com as outras pessoas, tenho sempre receio de ser mal sucedido(a					
No trabalho e nos tempos livres, gosto de fazer as coisas com calma					
Sou bastante agarrado(a) às minhas próprias maneiras de proceder					
Preferia colaborar com as outras pessoas do que competir com elas					
Sou distraído(a) e pouco determinado(a)					
Raramente me deixo levar pelos meus impulsos (caprichos)					
Sinto muitas vezes uma necessidade louca de me divertir		П		П	

Muitas vezes dá-me prazer brincar com teorias e ideias abstractas





ITEM	DF	D	N	С	CF
Não me custa nada gabar-me das minhas capacidades e dos meus sucessos					
Sou bastante capaz de organizar o meu tempo de maneira a fazer as coisas dentro do prazo				_ 🛭	
Sinto-me muitas vezes desamparado(a), desejando que alguém resolva os meus problemas por mim					
Para dizer verdade, nunca pulei de alegria					
Acredito que deixar os alunos ouvir pessoas com ideias discutíveis só os pode confundir e desorientar					
Os governantes deviam preocupar-se mais com os aspectos humanos					
Ao longo dos anos fiz algumas coisas bem estúpidas					
Assusto-me facilmente					
Não me dá muito prazer estar à conversa com as pessoas					
Tento sempre organizar os meus pensamentos em termos realistas, não dando asas à imaginação					
Acredito que a maioria das pessoas são, no fundo, bem intencionadas					
Não encaro os deveres cívicos, tais como votar, muito seriamente					
Não me zango facilmente					
Gosto de ter muita gente à minha volta					
Às vezes deixo-me absorver totalmente pela música que ouço					
Se for necessário, não hesito em manipular as pessoas para conseguir aquilo que quero					
Mantenho as minhas coisas limpas e em ordem					
Às vezes, sinto-me completamente inútil					
Às vezes não consigo afirmar-me tanto como devia					
Raramente sinto emoções fortes					
Tento ser delicado com todas as pessoas que encontro					
Às vezes, não sou tão seguro(a) ou digno(a) de confiança como deveria ser					
Poucas vezes, sinto-me inseguro(a) quando estou com outras pessoas					
Quando faço alguma coisa faço-a com todo o entusiamo					
Penso que é interessante aprender e cultivar novos hobbies (passatempos)					
Sei ser sarcástico(a) e cínico(a), quando necessário		- 🗆			
Tenho objectivos claros e faço por atingi-los de uma forma ordenada					
Custa-me resistir aos meus desejos					
Não gostaria de passar férias no Algarve					
Acho as discussões filosóficas aborrecidas					
Prefiro não falar de mim próprio(a) e das minhas realizações					
Perco muito tempo antes de me concentrar no trabalho					
Sinto que sou capaz de resolver a maioria dos meus problemas					
Já experimentei, algumas vezes, sensações de grande alegria ou de êxtase (arrebatamento)					

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ITEM	DF	D	N	C	CF
Acredito que as leis e as políticas sociais deviam mudar, de forma a reflectir as necessidades de um mundo em mudança					
Sou inflexível e duro(a) nas minhas atitudes					
Penso maduramente nas coisas, antes de tomar uma decisão	. 🗆 🖂		□ □		
Raramente me sinto amedrontado(a) ou ansioso(a)		- 0			
Sou conhecido(a) como uma pessoa amigável e simpática					D .
Tenho uma grande capacidade de fantasiar				. П	
Penso que a maior parte das pessoas abusa de nós, se as deixarmos					
Mantenho-me informado(a) e, geralmente tomo decisões inteligentes					
Sou conhecido(a) como uma pessoa de mau génio e irritável					
Normalmente prefiro fazer as coisas sozinho(a)					
Aborrece-me ver bailado ou dança moderna					
Mesmo que quisesse, não conseguiria enganar ninguém					
Não sou uma pessoa muito metódica (ordenada)					
Raramente estou triste ou deprimido(a)					
Já fui muitas vezes líder de grupos a que pertenci					
É importante para mim a maneira como eu vejo as coisas					
Algumas pessoas consideram-me frio(a) e calculista					
Pago as minhas dívidas a tempo e horas					
Já houve alturas em que fiquei tão envergonhado(a), que desejava meter-me num buraco					
Trabalho devagar, mas persistentemente (de forma contínua)					
Quando encontro uma maneira correcta de fazer qualquer coisa não mudo mais					
Hesito em expressar a minha raiva, mesmo quando justificada					
Quando inicio um programa de modificação pessoal, deixo de o cumprir após alguns dias					
Não me é dificil resistir a tentações					
Já fiz algumas coisas só pelo gozo ou gana de as fazer					
Gosto de resolver problemas e puzzles					
Sou melhor do que a maioria das pessoas e tenho consciência disso		- 🗆			
Sou uma pessoa aplicada, conseguindo sempre realizar o meu trabalho					
Quando estou numa grande tensão sinto-me às vezes como se me estivessem a fazer em pedaços					
Não sou um(a) grande optimista					
Acredito que devemos ter em conta a autoridade religiosa quando se trata de tomar decisões respeitantes à moral					
Nunca fazemos demasiado pelos pobres e pelos velhos					
Às vezes actuo primeiro e penso depois					
Muitas vezes sinto-me tenso(a) e enervado(a)					

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ITEM	DF	D	N	C	CF
Muitas pessoas veêm-me como uma pessoa um pouco fria e distante					
Não gosto de perder tempo a sonhar acordado(a)					
Penso que a maioria das pessoas com quem lido são honestas e dignas de confiança					
Sou frequentemente confrontado(a) com situações para as quais não estou totalmente preparado(a)					
Não sou considerado(a) uma pesssoa melindrosa ou irritável					
Sinto mesmo necessidade de estar com outras pessoas, quando estou sozinho(a) durante muito tempo					
Fico admirado(a) com os modelos que encontro na arte e na natureza					
Ser completamente honesto(a) é uma via inadequada para fazer negócios					
Gosto de ter as coisas no seu lugar, pois assim sei onde as encontrar					
Já senti, algumas vezes, uma sensação profunda de culpabilidade ou de ter pecado					
Normalmente, nas reuniões, deixo os outros falar					
Raramente presto atenção àquilo que sinto no momento					
Geralmente procuro ser atencioso(a) e delicado(a)					
Nos jogos de paciência, às vezes, faço batota					
Não fico muito atrapalhado(a) quando as pessoas se riem e fazem pouco de mim					
Muitas vezes sinto-me a rebentar de energia					
Frequentemente experimento comidas novas e desconhecidas					
Quando não gosto das pessoas, faço-lho saber					
Trabalho muito para conseguir o que quero					
Quando me apresentam o meu prato preferido tenho tendência a comer demasiado					
Procuro evitar filmes demasiado chocantes ou assustadores					
Às vezes perco o interesse quando as pessoas começam a falar sobre assuntos demasiado teóricos e abstractos					
Tento ser humilde					
Tenho dificuldades em me decidir a fazer o que devo					
Em casos de perigo conservo a cabeça fria					
Às vezes sinto-me a rebentar com tanta felicidade					
Penso que as ideias diferentes das nossas, sobre o que é bem ou o que é mal, das pessoas de outras sociedades, devem ter valor para elas					
Não gosto de pedintes					
Antes de agir, penso nas consequências					
Raramente me preocupo com o futuro					
Gosto muito de falar com as outras pessoas					
Dá-me gozo concentrar-me numa fantasia e explorar todas as suas possibilidades, deixando-a crescer e desenvolver-se					
Fico desconfiado(a) sempre que alguém me faz qualquer coisa agradável					

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ITEM	DF	D	N	C	CF
Tenho orgulho do meu bom senso					
Fico frequentemente aborrecido(a) com as pessoas com quem tenho de lidar	. 0		. 🗆	D .	
Prefiro trabalhos que eu possa fazer sózinho(a), sem ser incomodado(a) por outras pessoas	. 0			. 🗆	
A poesia pouco ou nada me diz					
Detestaria ser considerado(a) um(a) hipócrito(a)					
Parece que nunca consigo ser organizado(a)			. 0		
Tenho a tendencia a culpabilizar-me, se alguma coisa corre mal					
Muitas vezes as outras pessoas pedem-me para as ajudar a tomar decisões					
As minhas emoções e sentimentos são muitas e variadas					
Não sou muito conhecido(a) pela minha generosidade					
Quando assumo um compromisso podem sempre contar que eu o cumpra					
Sinto-me, muitas vezes, inferior às outras pessoas					
Não sou tão rápido(a) e vivo(a) como outras pessoas					
Prefiro passar o tempo em ambientes que me são familiares					
Quando sou insultado(a), tento apenas perdoar e esquecer					
Não sou ambicioso(a)					
Raramente cedo aos meus impulsos			- 🗆		
Gosto de estar onde está a acção					
Gosto de resolver puzzles dificieis					
Tenho uma opnião muito favorável acerca de mim próprio(a)					
Quando começo um projecto, quase sempre o termino					
Sinto quase sempre dificuldade em tomar decisões					
Não me considero uma pessoa alegre					
Julgo que é mais importante ser fiel aos próprios ideiais e princípios do que ter abertura de espírito					
As necessidades humanas devem ter sempre prioridade sobre considerações económicas					
Sou frequentemente levado(a) pelo impulso do momento					
Preocupo-me, muitas vezes, ao pensar que as coisas podem correr mal		- 🗆			
É fácil para mim sorrir e conviver com pessoas desconhecidas					
Quando vejo que estou a ser levado(a) pela imaginação, procuro concentrar-me ocupando-me com qualquer trabalho ou actividade					
A minha primeira reacção é confiar nas pessoas					
Não me parece que tenha sido bem sucedido(a), seja no que for					
É preciso muito para me arreliarem					
Prefiro passar férias numa praia concorrida do que numa cabana isolada nos bosques					
Certas formas de música têm um encanto infinito para mim					



		1	1		1
ITEM	DF	D	N	C	CF
Por vezes levo as pessoas a fazerem o que eu desejo					
Sou uma pessoa um tanto rigorosa: aprecio a ordem, em todas as coisas					
Tenho uma fraca opinião acerca de mim próprio(a)					
Prefiro tratar da minha vida a ser chefe das outras pessoas					
Poucas vezes me dou conta da influência que diferentes ambientes produzem nas pessoas					
A maioria das pessoas que conheço, gosta de mim					
Observo, rigorosamente, os princípios éticos que defendo					
Sinto-me à vontade na presença do meu patrão ou outras autoridades					
Normalmente, dou a impressão de estar sempre com pressa					
Por vezes mudo coisas em minha casa, só para experimentar a diferença					
Se alguém começa uma briga, estou sempre pronto(a) para lhe dar luta					
Esforço-me por conseguir tudo aquilo que eu puder					
Às vezes, como até me sentir mal					
Adoro as emoções da montanha russa					
Gosto pouco de me pronunciar sobre a natureza do universo e da condição humana			Ö		
Julgo que não sou melhor do que os outros, seja qual for a sua condição					
Quando um projecto se torna demasiado difícil, sinto-me inclinado(a) a começar um novo	- О.				
Consigo controlar-me bastante bem, em situações de crise					
Sou uma pessoa alegre e bem disposta					
Considero-me uma pessoa aberta e tolerante, no que respeita ao modo de vida das outras pessoas					
Penso que todos os seres humanos são dignos de respeito					
Raramente tomo decisões precipitadas					
Tenho menos receios que a maioria das pessoas					
Prendem-me aos meus amigos fortes laços afectivos					
Em criança, raramente achava piada aos jogos de faz-de-conta					
Tendo a pensar o melhor acerca das pessoas					
Sou uma pessoa muito competente		- 🗆			
Houve alturas em que experimentei ressentimento e amargura					
Os encontros sociais são, geralmente, aborrecidos para mim					
Às vezes, ao ler a poesia e ao olhar para uma obra de arte, sinto um arrepio ou uma onda de emoção					
Por vezes, meto medo ou lisonjeio as pessoas para as levar a fazer o que quero que elas façam					
Não tenho a obsessão da limpeza					
Às vezes, as coisas parecem-me bastante negras e desesperadas					
Nas conversas tendo a falar mais do que os outros					



	V SPECIAL COLUMN	n. (1 - 12 - 12 - 14 - 15 - 15 - 15 - 15 - 15 - 15 - 15			
ITEM	DF	D	N	C	CF
Acho fácil sentir empatia - quer dizer, sentir o que os outros sentem					
Considero-me uma pessoa caridosa		J. 0			□ :
Tento fazer as tarefas com todo o cuidado, para não ter necessidade de as fazer outra vez					
Se disser ou fizer algum mal a alguém, custa-me imenso conseguir encarar essa pessoa outra vez					
A minha vida decorre, a um ritmo rápido			. 0		
Quando estou em férias, prefiro voltar a um local genuíno e já conhecido					
Sou cabeçudo(a) e teimoso(a)					
Esforço-me por ser excelente em tudo o que faço					
Às vezes, faço as coisas de modo tão impulsivo que, mais tarde, me arrependo	· 🗆				
Atraem-me as cores alegres e os estilos exuberantes					
Tenho muita curiosidade intelectual					
Prefiro elogiar os outros a ser elogiado(a)					
Existem tantas pequenas coisas a fazer que, por vezes, simplesmente as ignoro					
Mesmo quando tudo parece correr mal, eu ainda consigo tomar boas decisões					
É raro utilizar palavras como fantástico ou sensacional, para descrever as minhas experiências					
Algo corre mal, se aos 25 anos as pessoas não sabem em que é que acreditam					
Tenho simpatia por pessoas com menos sorte do que eu					
Planeio, de antemão e com cuidado, as minhas viagens					
Às vezes, veêm-me à cabeça pensamentos aterradores					
Interesso-me, pessoalmente, pelas pessoas com quem trabalho					
Teria muita dificuldade em deixar a minha imaginação vaguear, sem controlo nem orientação					
Tenho bastante fé na natureza humana					
Sou eficiente e eficaz no meu trabalho					
Mesmo os pequenos contratempos podem ser frustrantes para mim					
Gosto de festas com muita gente					
Agrada-me mais ler poesia, que dá ênfase aos sentimentos e às imagens, do que uma história com princípio, meio e fim					
Orgulho-me da minha perspicácia em lidar com as pessoas					
Gasto muito tempo à procura de coisas que coloquei fora do lugar					
Muitas vezes, quando as coisas não me correm bem, perco a coragem e tenho vontade de desistir					
Não considero fácil controlar as situações					
Coisas estranhas, como certos sabores ou o nome de locais distantes, podem evocar em mim fortes emoções					

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ITEM	DF	D	N	C	CF
Quando posso, deixo o que estou a fazer para ajudar os outros					
Só se estivesse mesmo doente é que eu faltava a um dia de trabalho					
Fico embaraçado(a), quando as pessoas que eu conheço fazem asneiras					
Sou uma pessoa muito activa					
Sigo sempre o mesmo caminho, quando vou a qualquer sítio					
Frequentemente, arranjo discussões com a minha família e colegas de trabalho					
Tenho o vício do trabalho					
Consigo sempre manter os meus sentimentos sob controlo					
Nos acontecimentos desportivos, gosto de fazer parte da multidão					
Tenho uma grande variedade de interesses intelectuais					
Sou uma pessoa superior					
Tenho muita auto-disciplina					
Sou bastante estável, do ponto de vista emocional					
Rio facilmente					
Penso que a nova moralidade, que consiste em tudo permitir, não é moralidade nenhuma					
Gostaria mais que me considerassem "compreensivo(a)" (inclinado(a) a perdoar) do que "justo(a)" (inclinado(a) ao rigor)					
Penso duas vezes, antes de responder a uma pergunta	П				