

# Personality traits in multiple sclerosis: association with mood and anxiety disorders in a Romanian patients sample

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**Abstract.** Objectives: The purpose of the present study was to examine the association between anxiety, mood, and the five factor personality traits in multiple sclerosis (MS) patients and also to document personality differences between MS patients and controls. Material and Methods: The sample comprised 63 patients with MS and 49 individuals drawn from the general population, who did not have MS. Results: In our study MS patients did not differ from controls in the five personality domains. Results show a significant relationship between mood/anxiety symptoms and personality traits in MS patients. Conclusion: MS patients with higher anxiety and depression exhibited higher neuroticism and less extroversion, agreeableness, and conscientiousness than MS patients with lower anxiety and depression scores and normal controls.

**Key Words:** multiple sclerosis, personality, depression, anxiety.

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## Introduction

Multiple sclerosis (MS) is a progressive disease of the CNS and is characterized by the production of widespread lesions, or plaques, in the brain and spinal cord.

According to published data (Benedict et al 2005; Arnett et al 2008) the neurological symptomatology of MS is accompanied by a variety of neuropsychological and personality abnormalities, among which anxiety states and affective disorders (depression) are very important in the clinical picture and are especially significant for patients.

Personality can be defined as a set of enduring traits that characterize a person's typical thought patterns, beliefs, behaviors, and interpersonal interactions. Five dimensions of personality capture the vast majority of variance in an individual's personality (Mc Crae & Costa 1987). Known as the Five Factor Model (or Big Five Model), these core personality traits include neuroticism, extraversion, openness, conscientiousness, and agreeableness. There has been a recent interest in the ways personality is affected by neurological disease and, conversely, how personality may influence brain activity and adaptation to illness. Changes in personality and affect have been recognized in patients with multiple sclerosis (MS). Often, these changes may result from psychological reactions to the stress of MS (Benedict, et al 2001). Personality characteristics may predispose patients to make different choices or strategies for coping with this disease-related

distress. Extraversion and optimism, have been generally recognized as beneficial in MS patients. In particular, the patients with high Extraversion values might tend to employ more functional coping strategies to adapt to the disease-related stressors (Rätsep et al 2000).

Several studies have documented personality differences between MS patients and controls (Merkelbach et al 2003; Christodoulou et al 1999; Johnson et al 1996). However, relatively few have used instruments that measure the five core personality domains. The most common finding suggests that MS patients have increased neuroticism when compared to controls (Merkelbach et al 2003; Christodoulou et al 1999; Ozura et al 2010). Studies have also found low conscientiousness and high harm avoidance among MS patients (Christodoulou et al 1999).

The purpose of the present study was to examine the association between anxiety, mood, and the five factor personality traits in multiple sclerosis patients and also to document personality differences between MS patients and controls.

## Material and methods

### Participants

The study was conducted at the Hospital of Psychiatry and Neurology Oradea. The sample comprised 63 patients with SM and 49 individuals drawn from the general population, who did not have MS. The individuals from the general population

sample were screened for the presence of a chronic illness. The healthy group was selected after being matched in terms of age and level of education with the patients.

### Instruments

The Big Five Personality Inventory Short Form (NEO FFI) was developed by Costa and McCrae (1992) and adapted to Romanian language by Iliescu et al (2010). It consists of 60 items grouped into five subscales: Extraversion, Neuroticism, Agreeableness, and Openness to experience and Conscientiousness. Each subscale has 12 items. Respondents rated each item on a 5-point Likert type scale anchored by “fully false=1” and “fully true=5”. It is the most widely used and robust measure of personality traits with sound psychometric properties established by previous researchers (Costa & McCrae, 1992). Consistent with standard procedures outlined in the NEO-FFI manual, domain scores were transformed to t scores using published population-based normative data.

To measure anxiety, we used the Romanian version of the State-Trait Anxiety Inventory (STAI) (Spielberg 2007). The STAI is comprised of two scales: the state and trait forms. Each scale consists of 20 items that indicate the presence or absence of anxiety symptoms. The State-Trait-Anxiety Inventory is one of the self-rating anxiety scales most commonly used in research and clinical practice. Consistent with standard procedures outlined in the State-Trait Anxiety Inventory (STAI) manual, domain scores were transformed to t scores using published population-based normative data.

To measure depression Beck Depression Inventory (BDI) (Beck et al, 1969) was used. Beck Depression Inventory is a 21 items scale. Scores were marked as follows: normal = 0–9; minimal depression = 10–15; moderate depression = 16–19; moderate-severe depression = 19–29; and severe depression 30–63.

### Procedure

Written consent was obtained from the participants. Completion of the questionnaires was voluntary. A trained psychologist scored the personality questionnaire. Permission was obtained from Ethical Committee of University of Medicine and Pharmacy Oradea prior to the start of the study.

### Statistical analysis

Data were analysed using Statistical Package for Social Sciences (SPSS) version 20 for OS 10.9.1.

Distributions of the studied variables were examined using Shapiro-Wilk's tests. Statistical significance was assumed at  $\alpha \leq 0.05$ . Because the data wasn't normally distributed we used non-parametric statistics - Mann-Whitney U and Spearman correlation coefficients. Spearman correlations were used to investigate the relationship among personality variables anxiety and depression.

### Results

The main demographic and clinical characteristics of the study sample are reported in Table 1.

Mean score on the BDI was  $9.87 \pm 5.63$ . Specifically, 32 (50.8%) patients had moderate to severe depression and the remaining 31 (49.2%) were not depressed.

58.7% patients had a relapsing remitting (RR), 19% had primary progressive, and the remaining 22.2% a secondary progressive (SP) course of disease.

Table 1. Characteristics of the study sample (N=112)

	Controls (N=49)	MS Patients (N=63)
<b>Gender (woman/male, %)</b>	46/54	83/17
<b>Mean age <math>\pm</math> SD (years)</b>	48.49 $\pm$ 10.29	46.26 $\pm$ 8.49
<b>Mean education <math>\pm</math> SD (years)</b>	13.2 $\pm$ 3.78	13.6 $\pm$ 3.72
<b>Mean disease duration <math>\pm</math> SD years</b>	19.33 $\pm$ 11.37	
<b>Mean EDSS <math>\pm</math> SD</b>	6.62 $\pm$ 1.47	

The subjects were categorized as having elevated symptoms of anxiety if they scored higher than 1.5 standard deviations above the normative group mean.

There were not any significant differences between MS patients and controls in term of state anxiety ( $\chi^2=3.02$ ,  $p>0.05$ ).

Comparing with controls, a higher number of MS patients showed elevated anxiety ( $\chi^2=14.76$ ,  $p<0.05$ ).

About 55.6% of the MS patients and 44.9% of the controls have higher level of extroversion, the difference is not statistically significant ( $\chi^2=3.33$  and  $p>0.05$ ).

About 58.7% of the MS patients 57.1% of the controls have higher level of extroversion, the difference is not statistically significant ( $\chi^2=0.225$  and  $p>0.05$ ).

About 9.5 % of the patients and 38.8% of the controls have higher level of openness, the difference is statistically significant ( $\chi^2=22.63$  and  $p<0.001$ ).

About 15.9% of the MS patients and 20.4% of the controls have higher level of agreeableness, the difference is not statistically significant ( $\chi^2=0.78$  and  $p>0.05$ ).

74.6% of the MS patients and 61.2% of the controls have higher level of conscientiousness, the difference is not statistically significant ( $\chi^2=5.8$  and  $p>0.05$ ).

In MS patients, neuroticism is negatively associated with agreeableness and positively with depression and trait-anxiety. Extroversion is negatively associated with trait-anxiety. Agreeableness, openness and conscientiousness are negatively associated with trait anxiety.

### Discussions

The purpose of this study was to examine the association between anxiety, mood, and the five factor personality traits in multiple sclerosis patients and also to document personality differences between MS patients and controls. Previous research examining core personality change in MS has found mixed results. Some studies have found significant personality differences between MS patients and controls (Benedict et al. 2001) while others have not (Ratsep et al., 2000). In our study MS patients did not differ from controls in the five personality domains. Results suggest that a diagnosis of MS alone is not necessary significantly associated with personality change. However, MS patients with Axis I mood or anxiety disturbances are likely to experience concomitant personality changes (Bruce & Lynch, 2011).

Table 2. Personality, depression, and anxiety differences between MS patients and controls

	Controls (N=49)		MS Patients (N=63)		Mann-Whitney U	p
	mean	SD	mean	SD		
<b>Emotional Functioning</b>						
Anxiety -state	42.556	7.524	39.082	6.068	1169	0.028
Anxiety-trait	44.349	8.002	41.184	6.660	1155.5	0.023
Depression	9.873	5.638	4.163	1.007	408	0.001
<b>NEO-FFI</b>						
Neuroticism	26.206	8.413	28.674	10.020	1695	0.372
Extroversion	32.651	6.243	31.694	6.684	1394	0.38
Openness	26.524	3.632	28.245	6.685	1746	0.232
Agreeableness	26.762	5.994	27.429	9.539	1561	0.911
Conscientiousness	39.937	6.000	37.918	6.268	1266	0.103

Table 3. State anxiety in SM patients and controls

STAI-Y1 State anxiety		group		$\chi^2$	p
		MS patients	controls		
normal state	N	47	43	3.02	>0.05
	%	74.6%	87.8%		
elevated anxiety	N	16	6		
	%	25.4%	12.2%		

Table 4. Trait anxiety in SM patients and controls

STAI-Y1 Trait anxiety		group		$\chi^2$	p
		MS patients	controls		
normal state	N	29	40	14.76	<0.001
	%	46.0%	81.6%		
elevated anxiety	N	34	9		
	%	54.0%	18.4%		

Table 5. Neuroticism in MS patients and controls

Neuroticism		group		$\chi^2$	p
		MS patients	controls		
lower	N	10	5	3.33	>0.05
	%	15.9%	10.2%		
medium	N	18	22		
	%	28.6%	44.9%		
higher	N	35	22		
	%	55.6%	44.9%		

Table 6. Neuroticism in MS patients and controls

Extroversion		group		$\chi^2$	p
		MS patients	controls		
lower	N	9	6	0.225	>0.05
	%	14.3%	12.2%		
medium	N	17	15		
	%	27.0%	30.6%		
higher	N	37	28		
	%	58.7%	57.1%		

Table 7. Openness in MS patients and controls

		group		$\chi^2$	p
		MS patients	controls		
lower	N	18	20	22.63	<0.001
	%	28.6%	40.8%		
medium	N	39	10		
	%	61.9%	20.4%		
higher	N	6	19		
	%	9.5%	38.8%		

Table 8. Agreeableness in MS patients and controls

Agreeableness		group		$\chi^2$	p
		MS patients	controls		
lower	N	25	21	0.78	>0.05
	%	39.7%	42.9%		
medium	N	28	18		
	%	44.4%	36.7%		
higher	N	10	10		
	%	15.9%	20.4%		

Table 9. Conscientiousness in SM patients and controls

Conscientiousness		group		$\chi^2$	p
		patients	control		
lower	N	1	6	5.8	>0.05
	%	1.6%	12.2%		
medium	N	15	13		
	%	23.8%	26.5%		
higher	N	47	30		
	%	74.6%	61.2%		

Limitations of this study include the use of a relatively small normal control group and the lack of a neurologically intact psychiatric control group. Additional studies may wish to examine personality differences among MS patients with psychiatric illness and depressed/anxious controls.

Table 10. Association between MS patients' personality, depression, and anxiety variables

	1	2	3	4	5	6	7	8
<b>Anxiety -state</b>	1							
<b>Anxiety-trait</b>	0.218	1						
<b>Depression</b>	0.600**	0.420**	1					
<b>Neuroticism</b>	0.442**	0.175	0.540**	1				
<b>Extroversion</b>	-0.289*	-0.046	-0.49**	-0.43**	1			
<b>Openness</b>	-0.286*	0.244	-0.275*	-0.229	0.300*	1		
<b>Agreeableness</b>	-0.243	-0.22	-0.268*	-0.358**	0.205	0.008	1	
<b>Conscientiousness</b>	-0.411**	-0.005	-0.378**	-0.805**	0.322*	0.303*	0.347**	1

\*\* Correlation is significant at the 0.01 level (2-tailed); \* Correlation is significant at the 0.05 level (2-tailed)

## Conclusions

Results show a significant relationship between mood/anxiety symptoms and personality traits in MS patients.

MS patients with higher anxiety and depression exhibited higher neuroticism and less extroversion, agreeableness, and conscientiousness than MS patients with lower anxiety and depression scores and normal controls.

MS patients did not differ from controls in the five personality domains.

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