

Comparison of Personality Characteristics and Coping Strategies in Patients With Multiple Sclerosis and Control Group

Shahnaz Mohammadi,¹ Maryam Izadi-Mazidi,^{2,*} and Negin Kazemi¹

¹Department of Psychology, Kharazmi University, Tehran, IR Iran

²Department of Psychology, Department of Psychology, Shahed University, Tehran, IR Iran

*Corresponding author: Maryam Izadi-Mazidi, Department of Psychology, Shahid Chamran University, Ahvaz, IR Iran. Tel: +98-9171346040, E-mail: maryam.izadi.psy@gmail.com

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Background: The present study aimed to investigate personality traits and coping strategies in patients with multiple sclerosis (MS) who were admitted to Sina hospital compared with healthy individuals.

Objectives: The aim of the present study was to compare personality characteristics and coping strategies between patients with MS and healthy controls.

Materials and Methods: The study sample included 55 patients with MS and 57 matched healthy control individuals. The data were gathered via a demographic form, the ways of coping questionnaire, and the NEO five-factor inventory. The data were analyzed by multivariate analysis of variance (MANOVA), Pearson's correlation coefficient, and logistic regression.

Results: No significant differences in personality characteristics were observed between patients and healthy controls (all $P > 0.05$). Only the coping strategy subscale of Distancing was significant between patients and healthy controls ($P < 0.05$; all other subscales $P > 0.05$). Only the Neuroticism personality trait and the Distancing coping strategy were predictive of group membership (i.e., healthy or patient).

Conclusions: Our study suggests that the personality traits of patients with MS and healthy individuals are not significantly different. Patients with MS are likely to use the same coping strategies as healthy individuals, except in the subscale of Distancing.

Keywords: Multiple Sclerosis; Multiple Sclerosis; Multiple Sclerosis; Coping

1. Background

Multiple sclerosis (MS) is an inflammatory autoimmune disease that debilitates the central nervous system (CNS) (1-3). Women and young and middle-aged adults have an increased risk for this disorder (3-7). Patients with MS experience a range of motor (e.g., muscle weakness and poor balance) and non-motor (e.g., fatigue, pain, and memory impairment) symptoms (8). The variation in symptoms reflects the multifocal pathology of MS, including inflammation, demyelination, and axonal damage (2). In addition to specific illness-related stressors, demands, and limitations of this disease, problems with occupational performance, social functioning, economic status, and other stressful events have adverse effects on its course and nature (4). Therefore, patients develop certain coping strategies directed toward overcoming the challenges associated with these problems (4).

Coping strategies include both behavioral and psychological efforts to manage stressful events (4). Lazarus classified two broad types of coping strategies: problem-centered and emotion-centered. Problem-centered strategies attempt to reduce or eliminate the stressor. Emotion-centered strategies aim to change emotional reactions to the stressful event (9).

In another classification scheme, coping strategies are

divided into two types: adaptive strategies that reduce stress levels and maladaptive strategies by which stress levels increase (10). To date, a number of investigations have studied coping strategies in patients with MS. For instance, Mohr et al. (1997) (11) and Lynch et al. (2001) (12) both observed emotional coping skills among patients with MS. In a study by Milanlioglu et al. (2014), non-functional coping strategies were significantly higher among patients with a secondary-progressive type of MS compared with patients with a relapsing-remitting type of MS and a healthy control group (4).

Mikula et al. (2013) reported that coping is a significant mediator of the relationship between fatigue and mental health-related quality of life in all fatigue dimensions, whereas coping appears to be much less important in the association between fatigue and physical health-related quality of life (13). In a study conducted by Jean et al. (1999), higher levels of psychological distress were associated with a higher use of emotion-focused coping strategies (14). Similarly, Arnett et al. (2002) found that cognitive impairment was more likely to be related to depression when patients used low levels of active coping or high levels of avoidance (15). In contrast, Lynch, Kronencke, and Denney (2001) reported that the association

between MS and depression was not mediated by the use of various emotion-centered or problem-centered coping strategies (12).

Other studies have pointed to the role of personality characteristics in the course of MS, comorbid psychopathology (16), health-related quality of life of patients (17), and poor adherence to therapy (18). For example, Benedict et al. (2001) reported that patients with MS with cognitive impairment were more neurotic and less empathic, agreeable, and conscientious compared with healthy individuals (19). Bruce and Lynch (2011) showed a relationship between psychopathology and personality dysfunction in MS. Patients with MS and comorbid anxiety and/or depression exhibit more neuroticism and less extraversion, agreeableness, and conscientiousness than mentally healthy patients with MS and healthy individuals (16). Merkelbach, Konig, and Sittinger found that increased levels of neuroticism and excitability and decreased levels of extraversion had a higher impact than physical impairment on feelings of fatigue in patients with MS (20).

In a study conducted by Dubayova et al. (2013), type D personality was associated with both physical and mental dimensions of health-related quality of life in patients with MS. However, the role of anxiety and depression on physical and mental dimensions of health-related quality of life were stronger than personality type (17).

In addition to these controversial findings, the study of personality characteristics and coping strategies in patients with MS has received little attention in Iran. Therefore, the present study aimed to compare the personality characteristics and coping strategies in Iranian patients with MS and healthy individuals.

2. Objectives

The aim of the present study was to compare the personality characteristics and coping strategies in patients with MS and healthy individuals.

3. Materials and Methods

3.1. Subjects

The study was conducted over a period of 12 months from August 2013 to June 2014. A total of 55 patients diagnosed with MS and 57 matched healthy controls participated in the study. The patients had been admitted to Sina hospital in Tehran, Iran. The diagnosis of MS was performed by a neurologist. The control group included hospital staff as well as relatives of the patients, who had no history of MS. The inclusion criteria were as follows: volunteering to participate, literacy, between 18 and 65 years of age, no other neurological diseases or psychiatric disorder, and no abuse of alcohol or other substances.

After describing the procedures and purposes of the study, written informed consent was obtained from pa-

tients who met the inclusion criteria. Each subject was asked to complete the Persian version of the NEO Five-Factor Inventory (NEO-FFI) and Lazarus' ways of coping questionnaire as well as a questionnaire to obtain demographic data about gender, age, level of education, and marital status. Participants with incomplete questionnaires were excluded.

3.2. Questionnaires

3.2.1. Ways of Coping Questionnaire (WCQ)

Lazarus' ways of coping questionnaire (WCQ) consists of 66 items graded from 0 to 3. Fifty of the items are divided into four subscales, including Seeking social support, accepting responsibility, positive reappraisal, and Planful problem solving, to identify problem-focused strategies, and four subscales, including confronting coping, distancing, self-controlling, and escape-avoidance, to identify emotion-centered strategies (21, 22). In a study conducted by Dardas (2014), Cronbach's alphas for the eight subscales were reported to range from moderate to high (21). Santoro et al. (2014) reported that the construct validity of the questionnaire has been supported by consistency with theoretical predictions (22).

3.2.2. Neo Five-Factor Inventory (NEO-FFI)

The NEO Five-Factor Inventory (NEO-FFI) is a 240-item questionnaire. Each item requires a response on a 5-point Likert-type scale from strongly disagree to strongly agree (23). The items are grouped into 5 sub-scales including neuroticism, extraversion, openness, agreeableness, and conscientiousness (24-26). The inventory has considerable internal consistency and convergent and discriminant validity (27). In Haghshenas' study, Cronbach's alphas for the Persian form of the inventory were reported from 0.57 - 0.83 for the five subscales. The range of the test-retest reliability coefficient was reported to be from 0.53 - 0.76, with an average of 6.7 months between tests (28).

3.3. Statistical Analysis

Data were analyzed using multivariate analysis of variance (MANOVA), Pearson's correlation coefficient, and logistic regression. $P < 0.05$ was considered significant. Statistical analyses were carried out using SPSS v16 software.

4. Results

The demographic features of the participants are listed in Table 1. The personality characteristics of patients and healthy subjects were compared using MANOVA. There were no significant differences observed between patients and healthy individuals on the Neuroticism ($F = 3.15, P > 0.05$), Extraversion ($F = 0.06, P > 0.05$), Openness ($F = 2.02, P > 0.05$), Agreeableness ($F = 1.86, P > 0.05$), or Conscientiousness ($F = 0.11, P > 0.05$) characteristics. A

comparison of all 5 characteristics is shown in Table 2.

As shown in Table 3, there was a significant difference between patients and healthy individuals on the Distancing ($F = 7.62, P < 0.05$) coping strategy subscale. No significant differences in Seeking Social Support ($F = 0.08, P > 0.05$), Accepting Responsibility ($F = 0.69, P > 0.05$), Positive Reappraisal ($F = 0.03, P > 0.05$), Planful Problem Solving ($F = 1.06, P > 0.05$), Confrontive Coping ($F = 3.93, P > 0.05$), Self-Controlling ($F = 0.37, P > 0.05$), or Escape-Avoidance ($F = 3.72, P > 0.05$) were observed.

Correlations between the different dimensions of coping strategies and subscales of personality characteristics in patients with MS and healthy individuals are reported in Tables 4 and 5, respectively. As shown in Tables 4 and 5, there are significant correlations between some of the personality traits and coping strategies in both patients and healthy individuals. Despite some differences between the two groups, positive strategies were generally correlated with less neuroticism and more extraversion, openness to experience, agreeableness, and conscientiousness.

Predictions of group membership (i.e., patient or healthy) using logistic regression are shown in Table 6. The results show that there is a minimum amount of error in predicting group membership before adding variables of personality traits and coping strategies. In step 1, after adding the personality characteristics and coping strategies to the predictive equation, the prediction percentage increases from 53.1% to 70.4%. In patients with MS, the prediction percentage increases from 0 to 65.8%.

Table 1. The Demographic Features of the Participants

Demographic Variables	Values ^a
Group	
Patients with MS	55 (49.1%)
Healthy individuals	57 (50.9%)
Gender	
Male	20 (17.9%)
Female	92 (82.1%)
Marital status	
Single	51 (45.5%)
Married	58 (51.8%)
Divorced/widowed	0
Education	
Diploma and lower	50 (44.7%)
Associate's degree	2 (1.8%)
Bachelor's degree	52 (46.4%)
Postgraduate degree	8 (7.1%)
Age, y	
< 26	32 (28.6%)
26 - 40	67 (59.8%)
> 40	13 (11.6%)

^a Data are presented as No. (%).

Table 2. Comparison of Personality Characteristics Across Groups Using MANOVA^a

Personality Characteristic	Patients With MS ^b	Healthy Individuals ^b	F _{1,96}
Neuroticism	21.07 ± 7.47	18.25 ± 5.85	3.15
Extraversion	23.42 ± 5.97	23.48 ± 5.34	0.06
Openness	27.08 ± 3.92	28.30 ± 4.47	2.02
Agreeableness	32.67 ± 4.61	34.25 ± 4.26	1.86
Conscientiousness	29.21 ± 5.83	28.77 ± 5.73	0.11

^a P value is > 0.05.

^b The values are presented as mean ± SD.

Table 3. Comparison of Coping Strategies Across Groups Using MANOVA

Coping Strategy	Patients With MS ^a	Healthy Individuals ^a	F _{1,124}	P Value
Seeking social support	9.35 ± 3.69	9.67 ± 3.61	0.08	P > 0.05
Accepting responsibility	6.77 ± 5.33	6.39 ± 1.96	0.69	P > 0.05
Positive reappraisal	11.94 ± 3.36	12.27 ± 3.59	0.03	P > 0.05
Planful problem solving	8.98 ± 2.72	8.56 ± 2.23	1.06	P > 0.05
Confrontive coping	7.76 ± 2.76	6.7 ± 2.42	3.93	P > 0.05
Distancing	9.79 ± 3.20	7.91 ± 2.97	7.62	P < 0.05
Self-controlling	10.76 ± 3.22	10.44 ± 2.87	0.37	P > 0.05
Escape-avoidance	9.62 ± 3.91	7.95 ± 3.15	3.72	P > 0.05

^a The values are presented as the mean ± SD.

Table 4. Correlations Between Different Dimensions of Coping Strategies and Subscales of Personality Characteristics in Patients With MS.

Coping Strategies/ Neuroticism	Extraversion	Openness	Agreeableness	Conciseness
Seeking social support				
R = -0.29	R = 0.51	R = 0.11	R = 0.29	R = 0.25
P = 0.03	P < 0.001	P = 0.4	P = 0.03	P = 0.05
Accepting responsibility				
R = -0.04	R = 0.22	R = -0.09	R = -0.03	R = 0.013
P = 0.7	P = 0.1	P = 0.5	P = 0.8	P = 0.9
Positive reappraisal				
R = -0.38	R = 0.5	R = 0.13	R = 0.2	R = 0.5
P = 0.004	P < 0.001	P = 0.3	P = 0.04	P < 0.001
Planful problem solving				
R = -0.28	R = 0.38	R = 0.03	R = -0.03	R = 0.28
P = 0.03	P = 0.005	P = 0.8	P = 0.7	P = 0.03
Confrontive coping				
R = 0.08	R = -0.07	R = -0.08	R = -0.48	R = -0.09
P = 0.55	P = 0.58	P = 0.53	P < 0.001	P = 0.4
Distancing				
R = -0.45	R = 0.38	R = -0.13	R = 0.2	R = 0.4
P = 0.001	P = 0.004	P = 0.3	P = 0.04	P = 0.001
Self-controlling				
R = -0.32	R = 0.33	R = -0.14	R = 0.33	R = 0.42
P = 0.01	P = 0.01	P = 0.3	P = 0.01	P = 0.001
Escape-avoidance				
R = 0.39	R = -0.20	R = -0.36	R = -0.4	R = -0.41
P = 0.003	P = 0.13	P = 0.006	P = 0.002	P = 0.002

Table 5. Correlations Between Different Dimensions of Coping Strategies and Subscales of Personality Characteristics in Healthy Individuals

Coping Strategies/ Neuroticism	Extraversion	Openness	Agreeableness	Conciseness
Seeking social support				
R = -0.29	R = 0.51	R = 0.11	R = 0.29	R = 0.25
P = 0.03	P < 0.001	P = 0.4	P = 0.03	P = 0.05
Accepting responsibility				
R = -0.04	R = 0.22	R = -0.09	R = -0.03	R = 0.01
P = 0.7	P = 0.1	P = 0.5	P = 0.8	P = 0.9
Positive reappraisal				
R = -0.38	R = 0.52	R = 0.13	R = 0.27	R = 0.59
P = 0.004	P < 0.001	P = 0.3	P = 0.04	P < 0.001
Planful problem solving				
R = -0.28	R = 0.38	R = 0.03	R = -0.03	R = 0.28
P = 0.03	P = 0.005	P = 0.8	P = 0.7	P = 0.03
Confrontive coping				
R = 0.08	R = -0.07	R = -0.08	R = -0.48	R = -0.09
P = 0.5	P = 0.5	P = 0.5	P < 0.001	P = 0.4
Distancing				
R = -0.45	r = 0.38	R = -0.13	R = 0.28	R = 0.44
P = 0.001	P = 0.004	P = 0.3	P = 0.04	P = 0.001
Self-controlling				
R = -0.32	R = 0.33	R = -0.14	R = 0.33	R = 0.42
P = 0.017	P = 0.01	P = 0.3	P = 0.01	P = 0.001
Escape-avoidance				
R = 0.39	R = -0.20	R = -0.36	R = -0.4	R = -0.4
P = 0.003	P = 0.13	P = 0.006	P = 0.002	P = 0.002

Table 6. Prediction of Group Membership Before and After Entering Predictive Variables

Step	The Predicted Values		Percent Correct Prediction
	Group		
	Healthy Individual	Patients With MS	
Step 0			
Group			
Healthy individual	43	0	100%
Patients with MS	38	0	0
Total percentage			0.53
Step 1			
Group			
Healthy individual	32	11	74.4
Patients with MS	13	25	65.8
Total percentage			70.4

Table 7. Predictive Coefficients of Variables for Predicting Group Membership (Step 1)^a

Variable	β Coefficient	Wald	P	Odd Ratio
Neuroticism	0.11	4.78	0.02	1.12
Extraversion	0.06	1.03	0.3	1.06
Openness to experience	-0.03	0.32	0.5	0.96
Agreeableness	-0.02	0.05	0.8	0.98
Consciousness	0.04	0.4	0.5	1.04
Confrontive coping	0.03	0.04	0.8	1.03
Distancing	0.3	7.95	0.005	1.45
Self-control	-0.2	3.36	0.06	0.80
Seeking social support	-0.02	0.05	0.8	0.97
Acceptance responsibility	-0.008	0.007	0.9	0.99
Escape-avoidance	0.09	1.007	0.3	1.1
Planful problem solving	0.23	2.709	0.1	1.26
Positive reappraisal	-0.15	1.44	0.2	0.85
Constant	-5.37	1.46	0.22	0.005

^a Degrees of freedom (Df)=1.

The results of the Hosmer-Lemeshow goodness-of-fit showed that there was no significant difference between the observed and predicted results ($\chi^2 = 4.98, P > 0.05$). Therefore, this model is appropriate for predicting group membership. The findings also indicate that the predictive equation explains 24 to 32% of the variance in group membership based on personality characteristics and coping strategies.

Of 13 possible interactions [(8 coping strategies + 5 personality dimensions) \times 1 multiple sclerosis], only the interactions of Distancing ($\beta = 0.3, Wald = 7.95, OR = 1.45, P = 0.005$) and Neuroticism ($\beta = 0.11, Wald = 4.78, OR = 1.12, P =$

0.02) with MS were significant. The β coefficients indicate that higher scores on Neuroticism and Distancing scores increase the risk for MS.

5. Discussion

Our results showed that the majority of participants were women. This finding strengthens the notion that MS is more prevalent in women than men (5-7). However, it should be noted that women were more cooperative with the researcher in our study. Our results also indicate that MS was more prevalent among participants

in the 26 - 40 years old age subgroup. Previous studies have reported that MS is more prevalent among 20 - 40 years patients (3, 4).

We did not find significant differences in personality dimensions between the two groups. This finding is inconsistent with the results of Benedict et al. (2001), which found that patients with MS were more neurotic and less empathic, agreeable, or conscientious than healthy controls (19). In addition, Dubayova et al. (2003) found that type D personality was associated with both physical and mental dimensions of health-related quality of life in patients with MS (17).

This gap may be due to our small sample size or the characteristics of our participants, who were outpatients with little neurologic impairment. The results of Lynch (2011) (12), in which patients with MS and comorbid anxiety and/or depression exhibited more neuroticism and less extraversion, agreeableness, and conscientiousness than mentally healthy patients with MS and healthy individuals, may justify our findings. However, we did not assess the psychological status of patients to determine the presence of comorbid psychiatric conditions.

In terms of coping strategies, there was a significant difference between patients with MS and healthy individuals in the subscale of Distancing only. Differences in the Seeking Social Support, Accepting Responsibility, Positive Reappraisal, Planful Problem Solving, Self-Controlling, and Escape-Avoidance subscales were not significant. Consistent with our findings, Mohr et al. (1997) (11) and Lynch et al. (2001) (12) both observed emotional coping skills among patients with MS.

Patients with MS experience high levels of stress due to the unpredictable nature of their illness and uncertainty about the future. Therefore, some emotion-centered strategies, including Distancing, may be adoptive and help them to get relieved of stress.

In contrast to our results, Milanlioglu et al. (2014) reported higher levels of acceptance in patients with MS compared with healthy controls (4). They also found lower scores in positive reinterpretation and growth, suppression of competing activities, and planning in patients with a secondary-progressive type of MS compared with patients with a relapsing-remitting type of MS and healthy controls (4). Several studies have reported emotion-focused coping strategies in patients with comorbid psychological distress (12, 13) or cognitive impairments (30). We did not compare coping strategies in subtypes of MS or conduct psychological assessments to determine the presence of comorbid psychiatric disorders in the present study.

Our findings revealed significant correlations between some personality traits and coping strategies in both patients with MS and healthy individuals. In general, positive strategies were correlated with less neuroticism and more extraversion, openness to experience, agreeableness, and conscientiousness. Consistent with this finding, Ratsep et al. (2000) indicated that neuroticism was

significantly associated with emotion-centered coping in both patients with MS and healthy individuals. By contrast, they reported that agreeableness was correlated with avoidance-oriented coping strategies only in the patients with MS, and extraversion and openness to experience were linked to task-oriented coping strategies only in healthy controls (30).

We also found that personality characteristics and coping strategies have an impact on MS. The personality trait Neuroticism and the coping strategy subscale Distancing was able to predict group membership (i.e., patient or healthy).

Considering the current findings and the results of previous studies, clinicians need to be sensitive to coping strategies in patients with MS. It is important to develop educational programs, including strategies that help patients to more readily adjust to their condition. Moreover, more research is required in the future to increase the power of the current findings.

There were several limitations of the current study. First, the sample size was relatively small. Thus, a larger sample size is suggested for further studies. Second, our study used a cross-sectional design. Thus, we do not know the personality traits and coping strategies of the patients before the onset of disease.

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Authors' Contributions

Shahnaz Mohammadi was the project leader and was responsible for the project design. Negin Kazemi prepared the samples. All the authors were responsible for the psychological appraisal and for performing the statistical analyses and interpretation of the data. Maryam Izadi Mazidi drafted the manuscript, and Shahnaz Mohammadi and Negin Kazemi revised the manuscript. All the authors read and approved the final manuscript.

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