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Original Article

Intrapsychic and Interpersonal Realms in Patients with Multiple Sclerosis and Their Comparison with Normal Individuals: A Look at Object Relations and Anger Management

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Abstract

Objective: This study was designed to compare object relations and anger control between MS patients and normal individuals.
Method: The present study was a cross-sectional case-control study with two groups: the case group (patients with MS) and the control group (normal controls without MS). 80 patients and 80 healthy individuals were selected according to the inclusion and exclusion criteria using a simple random sampling method. The research's data collection tool was a three-part questionnaire consisting of demographic information, the Bell Object Relations and the Reality Testing Inventory (BORRTI) and the State-Trait Anger Expression Inventory 2 (STAXI-2). The data were analyzed by the SPSS software version 26 using descriptive and analytical statistics (stepwise regression).
Results: The results showed that in terms of object relations, there was no significant difference between the two groups except in alienation of relations (P = 0.035). The results also showed that in general, there was no statistically significant difference between the anger index of the group of MS patients and the normal controls. However, 12.8% of MS patients were significantly different in state of anger, trait anger and anger control compared to normal individuals. This difference was especially higher in angry temperament (P = 0.025) and the anger expression-in (P = 0.04).
Conclusion: Although patients with MS were not significantly different from healthy individuals in terms of intrapsychic and interpersonal functions in the context of object relations and anger management, it seems that more complex and multifaceted explanations lie in the results that need further research.

Key words: *Anger; Case-Control Study; Iran; Multiple Sclerosis; Object Relations*

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Multiple sclerosis (1) is one of the most common neurological disorders and a leading cause of disability. According to the latest global atlases, about 2.8 million people in the world (35.9 per 100,000 population) have the disease, with an average age of 32 years. The incidence of this disorder in women is twice as high as in men. The cumulative incidence of this disease in the world is 2.1 per 100,000 individuals per year, according to the latest reports from 75 countries (2). The prevalence of MS in Iran is 29.3 per 100,000 population, which is higher than the global average, and its incidence is 3.4 per 100,000 people, which has significantly increased in recent years (3).

MS has a variety of clinical phenotypes from rapid disability to lower levels of disability. Between 80% and 85% of patients develop a recurrent form that affects the functional structures of the brain and causes emotional changes. Among the neuropsychological explanations for emotional and thinking changes in MS patients are personality-focused approaches. Some studies have shown that the emotional changes resulting from MS have profound effects on patients' personality factors and traits, and consequently their quality of life (4). On the other hand, some studies have shown that the relationship between MS and personality traits is a two-way relationship. In addition to the fact that the disease contributes to personality change through emotional changes, people's intrinsic personality and emotional characteristics can also affect areas such as cognition, mood, and psychological well-being (5).

Neuropsychological syndromes such as anxiety, depression, bipolar disorder, and psychotic symptoms have been reported in up to 60% of patients with MS (6-8).

Although the relationship between intrinsic and acquired personality traits and MS is still unclear (9), some studies have emphasized the mediating role of emotion and the pattern of interpersonal relationships in these patients. These studies have shown that MS patients with type D or high-stress personalities have a lower quality of life, psychological well-being, and adaptability due to negative emotional experiences and inhibition of the expression of emotions or behaviors in social relationships (10, 11). Object relations is a theory in the field of personality pathology, which focuses on the role of emotional changes and social relations in the formation of personality and was proposed in late twentieth century. Object relations are a person's interactions with other external and internal people in a real or imagined way and the connection between their internal and external subject worlds. According to this theory, the psychological structure of humans is a coherent organization based on the patterns of interpersonal and intrapersonal relationships and the underlying thoughts and feelings that are formed mainly from childhood (12). Although the pattern of object relations in patient populations has received little attention, some studies have shown that the pattern of these relations is related to the performance of interpersonal relationships and psychological well-being in healthy individuals (13). According to this theory (Figure 1), a subject's pattern of action or object relations, which is the product of defense mechanisms as well as the mental, emotional, and behavioral experiences of relationship with oneself and others, affect one's ability to regulate and integrate emotions in dealing with oneself and others. From the object relations perspective, individuals' relationships are effective in cognitive regulation of behaviors, such as anger, that are used to change and modify an emotional state (14).

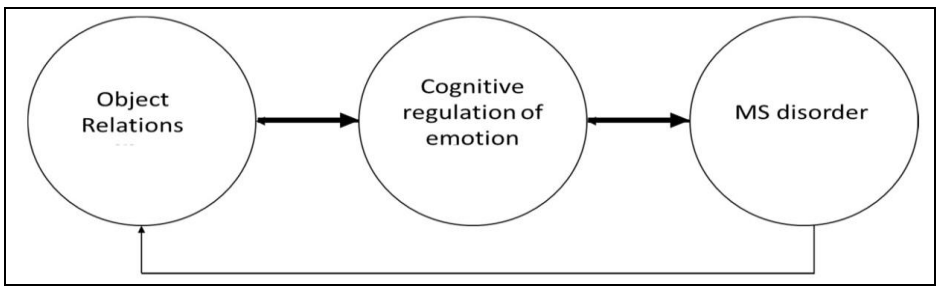

Figure 1. The Proposed Model of Object Relations Theory in the Present Study

The issues of anger expression-in and control, as common and dominant markers of cognitive regulation in MS patients, have been investigated in some studies. Angry temperament is the tendency to become angry very quickly and anger expression-in is redirection of the anger to the self, denial of thoughts or memories related to the situation that triggered anger or denial of the emotion of anger itself. These patients experience frustration and internal anger toward oneself and others due to limited daily functioning, feel that others are insensitive to changes caused by the disease process (15) and experience anger in the form of social cognitive deficits and negative social emotions (16).

In addition to the pattern of object relations as well as anger management in MS patients, another issue that requires further research is that most patients develop this disease in the fourth decade of life. Psychologically, this decade is associated with the development of social relationships and defects in the pattern of object relations and emotional regulation in healthy individuals at this

point can be manifested in the form of disorders in the quality of life and psychological well-being. A study on healthy individuals between the ages of 18 and 41 confirmed the association between object relationships and the severity of depressive symptoms (17).

Given what was mentioned above and the limited studies on the pattern of object relations and regulation of emotions such as anger in MS patients, the objective of the present study is to compare object relations and anger management of MS patients with those of the general population.

Materials and Methods

Study design

The present study is a cross-sectional case-control study with one case group (patients with MS) and one control group (individuals without MS). The study population included MS patients in the Ghaem Hospital (Mashhad, Iran) and the MS Association of Mashhad, their companions, and healthy individuals. It was conducted from March to May 2019. The sample size was estimated based on the stepwise regression method and 60 individuals were required for each variable. Considering the two outcome variables, the sample size was initially calculated to be 120, which was increased to 160 (80 patients with MS and 80 healthy individuals), taking into account a 70% response rate. Sampling was done using the simple random method. Patients who referred to Ghaem Hospital's MS Center as well as Mashhad MS Association were selected at random. They completed questionnaires about object relations and anger management. Also, healthy individuals who accompanied the patients and other healthy people were randomly selected. They completed the above questionnaires, too. For each patient in the exposure group, one normal control was considered. The age and sex matching of the two groups were taken into account in the statistical analysis. The eligibility criteria for the study group included: a definitive diagnosis of the disease based on the opinion of a specialist and Mc Donald's diagnostic criteria (2017) (18), an age range of 15-65 years, literacy and good sensory function as well as having one of the four MS subtypes including relapsing-remitting MS (RRMS), relapsing progressive MS (RPMS), secondary progressive MS (SPMS), and primary progressive MS (PPMS). The exclusion criteria included incomplete completion of the questionnaire and leaving more than 25% of the questions unanswered.

Participants

In the sampling process, a total of 100 patients and 100 healthy individuals were screened to check if they meet the inclusion criteria, and finally 80 individuals were selected for the patient (case) group and 80 people for the normal (control) group. The selected participants were assigned into two groups based on the purpose of the study. The response rate to the study tools or questionnaires was 100% and the number of excluded persons was zero in either group. Accordingly, the data obtained from all 80 participants in the exposure group and 80 individuals in the non-exposure group were analyzed (Figure 2).

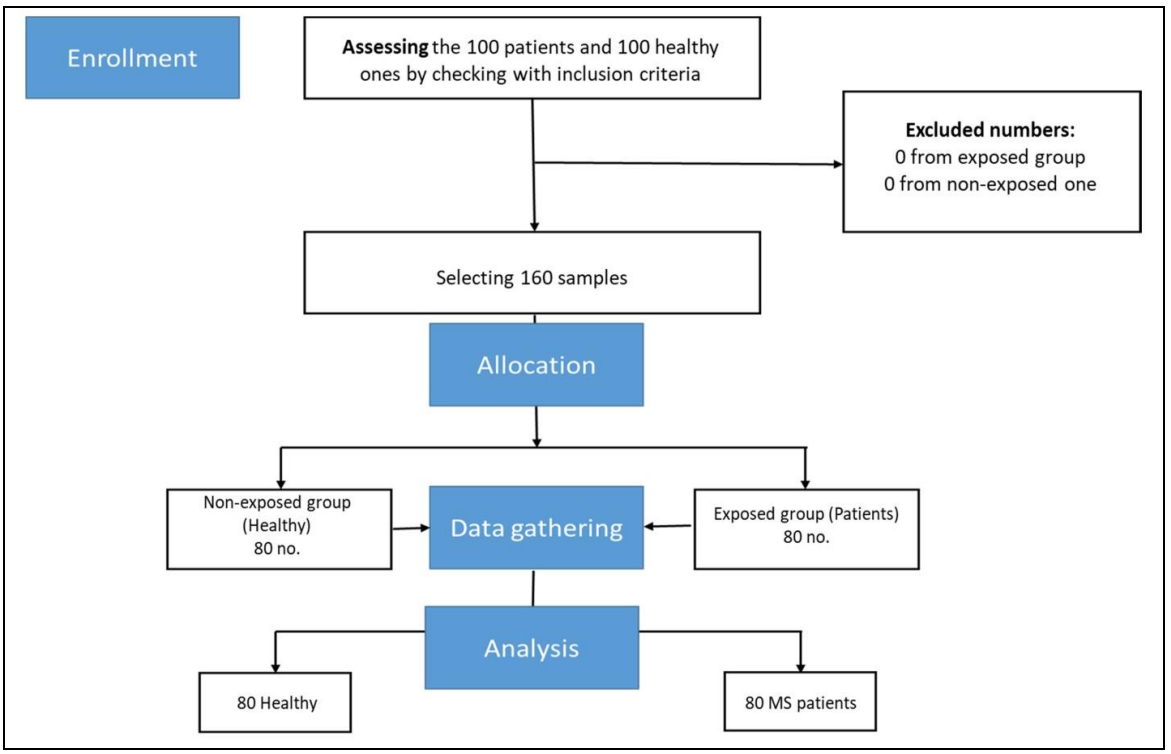

Figure 2. Flow Diagram of Sample Selection and Allocation Process in This Study

Measures

The data collection tool in the present study was a three-part self-report questionnaire that was completed by the study participants. To avoid differences and bias, the questionnaires were completed with the guidance of the same researcher who provided similar information and explanations to both groups. The first part of the data collection form included biographical and demographic information such as age and sex. The second part was the Object Relations and the Reality Testing Inventory (BORRTI) designed by Bell in 1995. In this questionnaire, 45 questions measure object relations and 45 questions are related to reality testing. Since the present study aimed to investigate the quality of object relations, only the 45 questions related to object relations were used. This form is known as FORM O (BORRTI FORM O). The questionnaire includes four subscales of social incompetence (SI), egocentricity (EGO), insecure attachment (IA), and alienation (ALN) (19). The psychometric properties of the Persian version of BORRTI were examined in an Iranian sample in 2020 and its validity was confirmed with Cronbach's [alpha of subscales from 0.66 to 0.77 (20). The scoring of this questionnaire is such that for each question, there are two options, yes and no. The yes and no options will get a score of 1 and 0, respectively. Some questions in the questionnaire are scored in reverse. It is also possible to score this questionnaire through a T-score. Bell considered a T-score above 60 as the cut-off point and believed that those who score above 60 are abnormal. The third part of the data form was the revised form of the STAXI questionnaire (1999), with the abbreviation STAXI-2. This final version provides useful and concise measurements of anger experience, expression, and control, and contains 57 items that provide scores for 6 scales, 5 subscales, and an overall anger expression index. The subject ranks his/her status on a 4-point scale, from seldom [1] to almost always [4]. The body of evidence provided by various studies (cited in the STAXI-2 Practice Guide) shows that this questionnaire has satisfactory validity and reliability. The validity and reliability of the Persian version of this questionnaire were confirmed in Iranian studies and this version has been used in various studies (21, 22).

In addition, necessary permits were obtained from the organizations where the study was conducted. During data collection, the questionnaires were coded while elaborating the objectives of the study and ensuring the confidentiality of information. Written or oral consent was obtained from all study participants.

Statistical analysis

The collected data were analyzed using SPSS software, version 26. To show the distribution of descriptive data, the mean and standard deviation of the two groups were reported. The independent variables were compared between the case and control groups using the t-test for independent samples. In addition, these variables were compared between the two groups by controlling for the effect of age and sex using multiple linear regression. The anger variable was compared between the two groups by independent chi-square test. The significance level was set at 5% in this study. To avoid bias in data analysis, the analyst was not aware of the attribution of the codes to the case and control groups.

Ethical issues

The Deputy of Research of Khayyam University of Mashhad approved the study protocol, which was conducted in accordance with the tenets of the Helsinki Declaration. All participants signed a written informed consent. The Ethics Committee of Khayyam University of Mashhad approved the study protocol.

Results

In this study, 80 patients with MS and 80 normal individuals were selected, of which 80 MS patients and 80 normal individuals participated and their results were analyzed. The mean age of MS patients and normal participants was 33.7 ± 8.5 and 31.1 ± 10.1 years, respectively (P = 0.078). 73.1% of MS patients and 69.6% of normal individuals were female. There was no statistically significant difference between the two groups in terms of sex (P = 0.632). Table 1 shows the mean ± SD of the parameters based on the BORRTI questionnaire in the two groups. As seen in Table 1, except for in the subscale of alienation, the two groups had no statistically significant difference in the other subscales. The mean of the alienation subscale was significantly higher in the MS group than in the normal group (P = 0.035). After scoring the questionnaire using T-scores, it was found that individuals are normal in terms of insecure attachment and alienation in both groups. However, the results of the analysis showed that 68.2% of MS patients and 64.7% of normal controls have problems in terms of egocentricity. This difference was not statistically significant (P = 0.670). The social incompetence problem was observed in 68.3% and 55.2% of MS patients and normal controls, respectively (P = 0.127).

Table 1. Mean and Standard Deviation of Indices based on Bell Questioner in Normal and Multiple Sclerosis Groups

	Normal		MS		
	Mean	SD	Mean	SD	P-value
Social Incompetence	10.27	2.87	11.11	3.36	0.126
Egocentricity	9.78	3.19	10.83	4.20	0.105
Insecure Attachment	4.73	2.27	5.34	2.29	0.111
Alienation	1.95	1.50	2.54	1.86	0.035

Results of multiple linear regression models for all Bell questioner components, after controlling the effects of age and sex, are shown in Table 2. Investigation of the subscales in the two groups using a linear regression model after adjusting for age and sex showed that in addition to alienation (coefficient = 0.63; 95% CI: 0.07 to 1.18; P = 0.027), social incompetence (coefficient = 0.96; 95% CI: -0.12 to 2.05; P = 0.081) and egocentricity (coefficient = 1.18; 95% CI: -0.10 to 2.46; P = 0.070) are marginally worse in the MS group.

Table 2. Association of Bell Questionnaire Component (Dependent Variables) with Normal Individuals and Multiple Sclerosis Patients After Controlling for the Effect of Age and Sex Using Multiple Linear Regression*

	Group(multiple sclerosis /Normal)	Age(year)	Gender(female/male)
Dependent variables	Coefficients(95%CI); p-value	Coefficients(95%CI); p-value	Coefficients(95%CI); p-value
Social Incompetence	0.96(-0.12 to 2.05); 0.081	-0.05(-0.10 to 0.01); 0.098	0.43(-0.76 to 1.62); 0.479
Egocentricity	1.18(-0.10 to 2.46); 0.070	-0.05(-0.12 to 0.02); 0.137	0.57(-0.83 to 1.98); 0.422
Insecure Attachment	0.59(-0.17 to 1.35); 0.125	0.00(-0.04 to 0.04); 0.899	0.48(-0.36 to 1.33); 0.261
Alienation	0.63(0.07 to 1.18); 0.027	-0.01(-0.04 to 0.02); 0.402	0.53(-0.07 to 1.14); 0.085

CI: confidence interval
*Each row is a multiple model that was run in Enter manner; Bell questionnaire component is the dependent variable in each model and independent variables are study groups, age and sex. The results of the groups are age and sex adjusted.

The results of anger analysis using the STAXI-2 questionnaire are presented in detail in Table 3. As seen in Table 3, components of angry temperament and anger expression-in (suppressed anger) were significantly worse in MS patients than in normal individuals, although the total anger index was not significantly different between the two groups.

Table 3. Mean of Anger Indices based on Spielberger Questionnaire in Multiple Sclerosis and Normal Groups

Components	Normal		MS		
	Mean	SD	Mean	SD	P-value
Feeling Angry	8.06	2.66	8.79	3.31	0.129
Feel like expressing anger verbally	7.48	2.88	7.91	3.41	0.395
Feel like expressing anger physically	5.91	2.05	6.17	2.34	0.469
S-Ang	21.46	6.85	22.87	8.27	0.224
Angry Temperament	7.35	2.41	8.32	2.93	0.025
Angry Reaction	12.27	3.14	12.90	4.21	0.288
T-Ang	19.62	4.69	21.22	6.31	0.074
Anger expression - Out	17.08	3.34	16.32	4.24	0.216
Anger expression - In	18.53	3.51	19.88	4.60	0.040
Anger Control - Out	22.33	4.94	22.78	5.12	0.573
Anger Control - In	22.61	5.01	22.28	5.73	0.705
AX Index	38.67	12.48	39.14	13.41	0.820
Total	121.62	12.03	125.36	17.62	0.122

The relationship between all components of anger indices based on the Spielberger questionnaire with the presence or absence of MS was investigated using separate multiple linear regression models after controlling the effects of age and sex. The results of these models are presented in Table 4. All of the above findings were maintained after adjusting for age and sex . As the results of this model show, the components of angry temperament (coefficient = 0.97; 95% CI: 0.11 to 1.82; P = 0.027), T-Ang (coefficient = 1.72; 95% CI: -0.04 to 3.48; P = 0.055), and anger expression-in (coefficient = 1.38; 95% CI: 0.08 to 2.69; P = 0.038) were significantly worse in MS patients after adjusting for age and sex, while other components did not have a significant relationship with MS.

After grouping the anger index, it was found that 12.8% of patients in the MS group had a score higher than 143, which was statistically significantly higher than in the normal control group (3.8%) (P = 0.047).

Table 4. Association of Anger Indices based on Spielberger Questionnaire with Normal Individual and Multiple Sclerosis Patients after Controlling for the Effect of Age and Sex Using Multiple Linear Regression*

	Group (multiple sclerosis /Normal)	Age (year)	Gender (female/male)
Dependent variables	Coefficients(95%CI); p-value	Coefficients(95%CI); p-value	Coefficients(95%CI); p-value
Feeling Angry	0.80(-0.16 to 1.75); 0.102	-0.03(-0.08 to 0.02); 0.251	0.42(-0.64 to 1.48); 0.436
Feel like expressing anger verbally	0.51(-0.49 to 1.51); 0.316	-0.04(-0.09 to 0.02); 0.176	0.47(-0.64 to 1.58); 0.400
Feel like expressing anger physically	0.34(-0.36 to 1.04); 0.341	-0.03(-0.07 to 0.01); 0.114	-0.11(-0.88 to 0.67); 0.783
S-Ang	1.65(-0.77 to 4.06); 0.180	-0.10(-0.23 to 0.03); 0.140	0.78(-1.88 to 3.45); 0.562
Angry Temperament	0.97(0.11 to 1.82); 0.027	-0.01(-0.06 to 0.04); 0.714	0.67(-0.27 to 1.61); 0.163
Angry Reaction	0.76(-0.42 to 1.93); 0.206	-0.06(-0.12 to 0.01); 0.082	0.72(-0.58 to 2.01); 0.276
T-Ang	1.72(-0.04 to 3.48); 0.055	-0.07(-0.16 to 0.03); 0.180	1.39(-0.56 to 3.33); 0.160
Anger expression - Out	-0.58(-1.78 to 0.64); 0.349	-0.06(-0.13 to 0.00); 0.063	-0.51(-1.84 to 0.83); 0.456
Anger expression - In	1.38(0.08 to 2.69); 0.038	-0.02(-0.09 to 0.05); 0.57	0.67(-0.78 to 2.11); 0.361
Anger Control - Out	0.15(-1.35 to 1.65); 0.845	0.15(0.07 to 0.23); < 0.001	-2.46(-4.12 to -0.81); 0.004
Anger Control - In	-0.60(-2.23 to 1.03); 0.467	0.14(0.05 to 0.22); 0.003	-2.43(-4.23 to -0.63); 0.009
AX Index	1.26(-2.65 to 5.18); 0.525	-0.37(-0.58 to -0.16); 0.001	5.05(0.73 to 9.38); 0.022
Total	3.72(-1.10 to 8.55); 0.129	0.04(-0.22 to 0.30); 0.766	-2.56(-7.88 to 2.77); 0.345

CI: confidence interval

*Each row is a multiple model that was run in Enter manner; Spielberger questionnaire component is the dependent variable in each model and independent variables are study groups, age and sex. The results of the groups are age and sex adjusted.

Discussion

The present study aimed to compare the intrapsychic and interpersonal realms of 80 MS patients with 80 normal individuals. The results showed that in terms of object relations, there was no significant difference between the two groups except in alienation; although, the scores of alienation were almost in the normal range in both groups. Alienation means withdrawing or separation of a person or a person's affections from an object or position of former attachment.

The object relations theory is based on the relational-structure model of personality in which instead of classification of the mind into three parts (ID, Ego, and Super-Ego), object relations are known as the primary cognitive-emotional unit (Primordial) of the mind. Object relationships consist of three parts: self-representation, object-representation and interactive experience-representation (23). Some studies support the role of object relations in balancing and adjusting mind and behavior (24). According to the results of the present study, the primary cognitive-emotional states of MS patients and healthy individuals were not significantly different from each other, but the disease slightly influenced the alienation of relations in patients, as well as egocentricity, and social incompetence. According to Captu (2018), a phenomenological study of the experiences of patients with amyotrophic lateral sclerosis (ALS) shows that communications with the self and the outside world are impaired in patients and focusing on interpersonal relations could be an effective restorative strategy in rebuilding these relations (25). Defects in self-awareness (26), personality changes (9) and fragile relationships occur simultaneously with the development of physical symptoms (27) in patients with MS. Some other studies, such as the study by Mahmoudi *et al.* (2018) have not shown a difference in the perception of social support and self-compassion between patients with MS and the general population (28). Despite these differences, some neuroscience studies have confirmed that in illness and health, the intrapsychic and interpersonal realms of individuals create each other (1). The issue of communications between self and others seems to be more complex in patients with MS and more detailed explanations are needed of the effect of the disease on the basic personality traits.

The results of the present study also showed that in general, anger index was not statistically significant between the two groups of MS patients and normal controls. However, 12.8% of MS patients were significantly different in state of anger, trait anger and anger control compared to normal individuals. This difference was especially higher in angry temperament (as an inherent feature) and anger expression (as an anger control feature).

In a study on the nature of anger in patients with MS, Laing (2020) stated that the occurrence of periodic outbursts of anger in these patients is related to frustration caused by the inability to overcome the limitations caused by the disease and insensitivity of others to the effects of the disease (15). A study by Ramio *et al.* in 2017 found that the reason for the difference in anger occurrence between MS patients and healthy individuals was the difference in their mental

function or their Theory of Mind. This mental function was significantly related to the executive functioning of the patients and not cognitive symptoms such as anxiety and depression (29). Based on the theory of mind (ToM), it seems that in patients with mild to moderate MS cognitive deficits can occur independent of behavioral disorders. On the other hand, the absence of major differences in anger between MS patients and normal individuals can be attributed to social cognitive deficits in MS patients due to amygdala dysfunction, which results in impaired recognition of negative emotions such as fear and anger (16).

Limitation

One of the limitations of the present study was the small sample size of both groups and the need for multivariate analysis in relation to anger in these patients. Another limitation of the study is the lack of more detailed information about the MS patients, such as symptom severity and MRI results. Considering neurological explanations along with psychoanalytic variables can create new windows in the interplay of intrapsychic and interpersonal realms in these patients.

Conclusion

Although in general, patients with MS were not significantly different from healthy individuals in terms of intrapsychic and interpersonal functions in the context of object relations and anger management, it seems that more complex and multifaceted explanations lie in these results that need further research.

Acknowledgment

None.

Conflict of Interest

None.

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