

## Role of Sexual Function in Prediction of Anxiety, Stress and Depression in Patients with Multiple Sclerosis

Negar Mota<sup>1</sup>, Adis Kraskian-Mujembari<sup>2</sup>, Bijan Pirnia<sup>3\*</sup>

<sup>1</sup>-M.A of Clinical Psychology, Islamic Azad University-International Kish Branch, Kish, Iran.

<sup>2</sup>-Assistant Professor, Department of Psychology, School of Psychology, Karaj Branch, Islamic Azad University, Karaj, Iran.

<sup>3</sup>-PhD Student of Clinical Psychology, Department of Psychology, Faculty of Humanities, University of Science and Culture, Tehran, Iran. Behavioral Sciences Research Center of Shahid Beheshti University of Medical Sciences, Tehran, Iran.

(\*Corresponding Author: Bijan Pirnia, Email: b.pirnia@usc.ac.ir ).

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### Abstract

**Introduction:** Multiple sclerosis is one of the most serious causes of neurodevelopmental disorder in young adults, which can reduce libido, self-esteem and emotional reactions. The aim of this study was to investigate the role of sexual function in predicting anxiety, stress, and depression in patients with multiple sclerosis.

**Method:** The present study was a cross-sectional study. The data of the present study were collected during April to July 2018. For this purpose, 132 patients were selected through purposive sampling method among women with Multiple Sclerosis under the coverage of MS Society of Iran. Demographic checklist, structured clinical interview, self-esteem scale, female sexual function index, and depression, anxiety and stress scale were used to collect data. Data were analyzed by Pearson correlation test, linear regression analysis and step-by-step analysis in SPSS software environment.

**Results:** Data analysis showed that sexual function among patients was a predictor of anxiety and stress (*all B's* > 2.44; *all p's* <0.035), but failed to predict depression (*p*>0.05).

**Conclusion:** The results of this study reflect the difference in the fundamental and multidimensional nature of depression compared to anxiety and stress indices. This findings showed sexual function in predicting depression index is insignificant. In fact, depression index is more complex than anxiety and stress, although they have common pathologic base. The results of this study can be used to design new pathologic approaches

**Declaration of Interest:** None.

**Key words:** Multiple sclerosis, Sexual function, Depression, Anxiety, Stress.

### Introduction

Multiple sclerosis (MS) is a multifactor inflammatory neurological disorder that imposes an additional burden on the treatment system worldwide (1). The high prevalence of these disease and chronic disabilities associated with these conditions has recognized this disease as a health priority (2). Multiple Sclerosis is a degenerative

neurological disease that usually occurs between the ages of 20 and 50 years (3).

This disease is rapidly increasing in the world, with more than 400,000 people diagnosed with MS in the United States (5). This disease causes a significant dysfunction in the occupational, educational, and social performance of patients (6).

Multiple sclerosis is more common in women than in men, and its age is from early to mid-adult (2). Patients with MS should deal with a negative and unpredictable course of health, changing social and friendly relationships and growing support needs. Also, the number of MS patients in women is 3 times greater than that of men (2).

Studies have showed that the prevalence of anxiety and depression in patients with multiple sclerosis is high (7, 8). Depression is a common comorbidity in patients with multiple sclerosis (9).

Avoidance and excitement-centered strategies are the predictors of anxiety and depression in these patients (7). On the other hand, psychosocial flexibility is considered as a protective factor against depression (10).

According to the existing literature, symptoms of depression in MS patients are associated with a decrease in quality of life and an increased risk of suicide and can affect the physical and psychological health of patients. In addition to the psychological effects of this disease, MS is associated with physical complaints such as, pelvic pain that damage the quality of life of the affected patients (11). In addition to high prevalence of depression in women with MS, sexual dysfunctions are common in these patients (12). Prevalence studies show that 40-80% of women with multiple sclerosis have sexual complaints (13). In this regard, the prevalence of sexual dysfunction in depressed women has been significantly higher than non-depressed women (12). This sexual dysfunctions in women with MS needs to be considered (14). Sexual function in MS patients is associated with dysfunction and seems to be accompanied by increased disability, pain and depression (15).

In terms of hormones, the interaction between the immune system and sex hormones has been observed in the development of sexual

dimorphism in MS patients (16). Based on the anti-inflammatory effects of estrogen on sytokinin, estrogen is used as an alternative in MS treatment (16).

Despite the prevalence of sexual dysfunction in MS patients, the relationship between this dysfunction and psychological components has been less studied (17).

Physical and neuropsychological syndrome due to MS along with psychosocial issues directly affects the patients' sexual life and reduces libido and self-esteem of the patients (13). Despite numerous studies on various aspects of mental health in patients with multiple sclerosis, the role of sexual function in the prediction of mood indices has not been evaluated to date. Since multiple sclerosis has many negative consequences on health, social interactions, sexual function, and emotional reactions of affected individuals, and these consequences play a significant role in reducing the quality of life of patients, the present study was conducted to investigate the role of sexual function in predicting anxiety, stress and depression in patients with multiple sclerosis.

### **Methods**

In a cross-sectional study in a relational design, during April to July 2018, among women with multiple sclerosis under the coverage of MS Society in Iran, 132 patients were selected by purposive sampling method and after obtaining entry criteria and informed consent were introduced into the research process. The Inclusion criteria were: 1) age range of 18 to 45 years old; 2) diagnosis of Primary-progressive MS (PPMS, ICD 9-CM 340); 3) ability to read and write; and 4) residence in the Tehran city and the suburbs with a standard deviation of 30 square kilometers. Exclusion criteria were also included: 1) acute psychiatric illness or personality disorders; 2) taking any medication

affecting emotional and sexual processes; 3) not receiving any psychological services in the last 6 months; and 4) Failure to obtain informed consent regarding participation in the study.

Primary-progressive MS (PPMS) is characterized by worsening neurologic function (accumulation of disability) from the onset of symptoms, without early relapses or remissions. Several studies have suggested that the PPMS may take two to three years longer to diagnose than relapsing-remitting MS. Only 10% to 15% of people with MS have this form. Therefore, the age criteria is important in diagnosis (number 2 of inclusion criteria).

The data were collected after coordination with the MS Society in Iran at a time period. To collect data, demographic checklist, structured clinical interview, female sexual function index, and depression, anxiety and stress scale were used. The data were analyzed by Pearson correlation test, linear regression analysis and step-by-step analysis in the software environment of SPSS version 22. All stages the study was carried out based on the latest version of the Declaration of Helsinki (18, 19).

**1. Demographic Checklist:** This questionnaire was prepared by the researcher to collect personal information such as age, education, occupation, duration of marriage, and duration of illness (20).

**2. The Structured Clinical Interview for DSM-4 (SCID-4):** It is a clinical interview that is used to diagnose axial disorders based on DSM-IV (21). The reliability coefficient for assessors for SCID is reported to be 60%. The diagnostic agreement of this instrument in Persian was favorable for most of the specific and general diagnosis with reliability greater than 0.6. Kappa coefficient for all current diagnoses and life expectancy diagnosis was obtained equal to 0.52 and 0.55, respectively (22).

### **3. Female Sexual Function Index Questionnaire:**

Sexual function of participants was evaluated through the Persian language version of the Female Sexual Function Index (P-FSFI) with 19 items. This index measures sexual function in six subsets of desire, stimulation, humidity, orgasm, pain and satisfaction. A higher score indicates a more favorable sexual function. Scores are in the range of 2-36. The validity and reliability of this scale have been reported as desirable in Iranian society (23). Cronbach's alpha for this tool was 0.88 in this study.

### **4. Depression, Anxiety, and Stress Scales:**

This scale was made by Lovibond and is a collection of three self-evaluation sub-scales designed to measure negative emotional states of depression, anxiety and tension. Each of its three sub-scales includes 7 items, which are graded in a four-point Likert scale, from at all to high. The lowest score is 21 and the highest score on this scale is 84, which refers to the high level of this syndrome. Lovibond assessed the reliability of this tool as acceptable for all three levels of depression, anxiety and stress using Cronbach's alpha (0.91, 0.84, and 0.90, respectively) (20).

### **Results**

Pearson correlation test, linear regression analysis and step-by-step analysis were used to analyze the data. The parameters of the parametric tests were examined before the statistical test was selected. The results of Kolmogorov-Smirnov test showed that the distribution of the scores of the participants in all three studied variables was normal ( $p > 0.05$ ). The assumption of linear relationship between the variables was also confirmed by the variance analysis and its pre-test ( $p < 0.01$ ). The average age of the participants was 31.92 with a deviation of 7.59. Regarding the level of education, 31.8% had a diploma, 29.5% had BSc, 13.6% had MSc, 12.1% had associate degree, 9.8% had PhD, and 3% had lower

diplomas degree. In terms of the duration of marriage, 47.7% were reported between 1 to 7 years, 33.3 between 8-14 years, 12.9 % between 21 and 15 years, and 6.1% between 22-28 years. Regarding the duration of disease, 47% reported between 1-5 years, 22% less

than one year, 16.7% between 6-10 years and finally 14.3% more than 10 years. In table 1, the results of Pearson correlation test are presented.

Table 1. Correlation coefficients between research variables

	Mean	Standard deviation	1	2	3	4
1. Depression	7.89	9.21	1.000			
2. Anxiety	7.51	10.16	0.879 **	1.000		
3. Stress	8.14	13.17	0.780 **	0.871 **	1.000	
4. Sexual function	33.26	45.80	-0.639 **	-0.696	-0.800	1.000

\*\* : P<0.0

As shown in Table 1, there is a reverse relationship between sexual function and depression, anxiety, and stress (*all p* <0.01). In

order to evaluate the prediction ability of mood variables by sexual function, stepwise regression analysis was used.

Table 2. The results of regression analysis to predict anxiety and stress based on sexual function

Variable	b coefficient	Standard deviation	Beta	T
Predictor: Sexual function	11.72	0.94	-	5.51*
Criterion: Stress	-0.59		-0.63	3.72*
Predictor: Sexual function	37.41	1.53	-	6.31*
Criterion: Stress	-0.88	0.35	-0.81	5.71*

\*: p<0.05

As shown in Table 2, the results showed that sexual function was a predictor of two components of anxiety and stress (*all p*'s<0.05). Depression component was not predicted by sexual function (*p* >0.05).

**Discussion**

This study was conducted to investigate the role of sexual function in predicting anxiety, stress and depression in patients with multiple sclerosis. The results of this study showed that sexual function was a predictor of anxiety and stress, but it could not predict depression.

According to the findings of the present study, the results of the study by Schairer et al. (24) showed that the severity of sexual dysfunction in patients with multiple sclerosis was associated with a decrease in mental health issues. Also, the results of Calabrò et al. (25) showed that multiple sclerosis is associated with decreased libido, self-esteem and emotional reactions. In line with our results, the results of Salomão et al. (26) showed that the experience of anxiety and depression syndrome is associated with an increased risk of sexual dysfunction in women. In this regard, the results of Perez-Lopez et al. (27) showed that there is a significant relationship

between low sexual function and mood syndrome in women. A part of our results showed that sexual function was not a predictor of depression index in patients. The results of Hosel et al. (12) showed that sexual dysfunction is associated with an increase in the depression in women with multiple sclerosis, although sexual dysfunction can be considered as a consequence of multiple sclerosis and act independently of depression. These findings are in line with our findings that showed sexual function in predicting depression index is insignificant. In fact, depression index is more complex than anxiety and stress, although they have common pathologic base.

The effects of multiple sclerosis on cognition and cognitive processes are of research support. This deficiency can also affect self-esteem in the form of a defective cycle of patient perceptions of his mood. As the research background shows, sexual function is a multi-factor index (12) and is affected by multiple mood, body image and pain in patients with multiple sclerosis. The role of self-care programs and coping strategies can also be mentioned. On the other hand, people with multiple sclerosis often use emotional coping strategies to deal with problems, and these strategies tend to increase the incidence of emotional reactions.

Along with our findings, anxiety in MS patients is due to an impairment of cognitive processes (28).

Biologically, oxidative stress plays an important role in the pathogenesis of multiple sclerosis, and high levels of oxidative stress are observed in MS patients (29). Therefore, the neurological treatment based on aggravating integrated response to stress is considered as a modern therapeutic approach (30).

This study was accompanied by some limitations in the implementation process. In assessing the degree of disability caused by the

disease, it is limited to the duration of the infection, although this index cannot be a good indicator of the disability variable. Also, data collection was carried out through interviews and questionnaires, and biomarker evaluations were not used, the limitations that could be considered in future studies. The findings of the present study can be used to design interventional approaches in patients with multiple sclerosis. A complementary study is recommended in men society with multiple sclerosis. Also, a clinical trial aimed at evaluating the effectiveness of sexual interventions on the promotion of mood indices could be a good route for future studies.

#### ***Conflict of interest***

The authors did not report any conflicts of interest.

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