

## Depression and associated demographic factors' correlation in Multiple Sclerosis patients

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### Abstract

**Introduction :** Depression is the most common mental disorder in patients with multiple sclerosis which is along with disability, disease recurrence and enormous economic burden. Hence, this study was designed to examine rates of depression in multiple sclerosis patients and relationship between depression and associated factors.

**Materials & Methods:** A descriptive study was carried out on a total of 110 multiple sclerosis patients from Iran MS Society applying selected convenient method. Data collection was conducted applying a questionnaire with both individual and disease characteristics related questions as well as the beck depression scale (BDI). The SPSS 16 software version and descriptive inferential statistics were used analyzing data.

**Results:** The data showed that 6% of multiple sclerosis patients had no depression, and the rest had suffered depression, ranged from mild (46%), moderate (26%) and severe (22%). Examination of the applied variables showed a significant difference for depression associated with education level, frequent disease recurrence and family economic status ( $p < 0.05$ ).

**Conclusion:** This study showed a high rate depression in multiple sclerosis patients which could jeopardize patients health. Hence, a timely diagnosis is recommended for depression treatment through psychiatric periodically examinations.

**Keywords:** Multiple sclerosis, Depression, Demographic factors

### Introduction

Depression is one of the most common mental disorders in the human population. Disability following depression is fourth main cause of death in world it is predicting by the World Health Organization that the depression could be became second cause of mortality by 2020 (1,2). The stressful life events, especially long-term problems such as physical illnesses could outbreak depression, as well as the disease would be chronic with persisting of the stressors (1). Francel believed that the depression emerge in response to grief with

regard to their physical condition in people with physical illness (3). Multiple Sclerosis is one of common disease that could lead to the depression due to chronic nature and low power consumption (3). MS is a chronic and destructive illness of the central nervous system and is the most common neurological disease (4). MS involves young people causes mood disorders, psychological symptoms with no defined prognosis (5). Depression in patients with MS comprising approximately 50-60% of cases (6). MS causes depression due to some factors such as treatment

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duration, disease unpredictability, disease recurrent attacks, loss of previous abilities and problems for instance job loss and medications side effects (3). Depression severity has devastating effect on life quality, physical abilities, cognitive strain and disease recurrences (7). In addition, MS patient's intentions to committed suicide are closely related to the depression and severity of depressive symptoms (8). The community support of multiple sclerosis patients reported that the risk of committing suicide in MS patients typically 7.7 times higher than the normal individuals. Suicidal thoughts in Iranian patients with MS are %30 which is 5 times higher than the rest of society (3).

In chronic diseases, Often overlooked Psychological aspects. Weather the most patients with these Psychological aspects that derived of chronic medical problems, would have consistency (9). In addition to physical disabilities patients with chronic diseases suffer from the psychological effects of these restrictive conditions. With regards to the characteristics of chronic and relapsing multiple sclerosis, the disease may obviously effect on various degrees of life, self-esteem, family, career and future patients. However, most of the literatures are given attention to the neurological symptoms of MS rather than psychological - social aspects, which is common in MS patients. In a research by Thornton et al. to study level of concern in MS patients and the relationship between concern with anxiety and depression, results showed that anxiety and depression in patients with MS was significantly higher than the control group (10). In a study conducted by the Goy et al., rate of depression in MS patients was reported between 15.8 to 47 % (11). In

addition, Patton and et al, reported the risk of major depressive disorder in lifetime of MS patients is over 50% (12). Paying attention is essential to the psychological symptoms, particularly depression disorder in multiple sclerosis patients.

Because of the depression in MS patients as one of the affecting marks of recurrent disease, and increasing risk of suicide in these patients therefore, it seems that paying attention is essential for mental health problems, especially depression in MS patients. Although some studies conducted on the depression rates, but due to effect of depression reduction in MS patient and efforts to improve their quality of life, it is necessary to investigate the psychological symptoms especially depression periodically. On the other hand these affords could more importantly lead to precise identification of causes and factors associated with depression in patients trying to solve their problem. Since most studies of depression in patients with multiple sclerosis were conducted outside of Iran, which could be due to the severity of the disease, race and different socioeconomic and cultural issues, therefore, it would be necessary to check related symptoms in Iranian patients seek to address the underlying causes of depression. The study aimed to determine the prevalence of depression in MS patients as well as identifying MS related factors.

### **Materials and Methods**

The current descriptive study was designed to determine the rates of depression and associated factors with depression in patients from Multiple Sclerosis Society, Tehran, Iran, 2011. All patients had 20 to 45 years old and

were member of the Iranian MS Society having continuous disease at least 6 months and expanded disability status rated 0 – 5.5 according to the Medical Board. Expanded disability status score ranging from 0-10; 10 represents death and zero indicates normal status and abilities in different organs especially nervous system (13). A main criterion for exclusion in selection of patients was any acute illness and requiring hospitalization (including debilitating disease of heart, respiratory, liver, skeletal muscle and kidney). In this survey totally 110 MS patients participated during spring 2011.

Data collection tool was applied to include personal demographic characteristics and MS patients' information about the disease. For each part related questionnaire was given. Demographic questions were composed age, sex, height, weight, marital status, education, number of children, occupation, income adequacy, type of financial support.

Illness questions were about duration of disease, number of relapses and hospitalizations during the past year, the first symptom and most difficult diseases, drug, type of MS, expanded disability status. Beck Depression Inventory questionnaire was applied to assess depression in patients with MS. Beck Depression Inventory consists of 21 questions, the minimum score for each question was zero and the maximum score was 3.

The questionnaire was fully explained by researcher subsequently completed by patients. In cases with visual impairment and who was unable to read the questionnaire, the questionnaire was completed by conversation. Subsequent to demographic data collection, depression score and its severity was

determined using Beck Standard test as patients with no depression (0-9), mild (10-18), moderate (19-29) as well as severe depression (30-63) through depression scoring system. The validity of the questionnaire was confirmed through evaluation of numerous studies (15-17). Internal consistency and Cronbach's alpha coefficient (0.89) was used to evaluate the reliability of the instrument (20). Questionnaire was randomly distributed to MS patients with noted criteria in different days and they voluntarily participated in the study. Sample size was determined according to below formula:  $N = z_{2pq} / d^2$

Descriptive statistics were used to analyze data. Inferential statistics (independent T test, 2 and ANOVA) were applied to compare the groups and to evaluate association between depression and demographic characteristics of MS patients through SPSS16 package. Normality of the data was performed by Kolmogorov-Smirnov Tests. P value <0.05 was considered significant.

### **Ethical Considerations**

The study was conducted according to ethical principles, including the World Medical Association Declaration of Tarbiat Modares University. A completed consent was obtained from contributors in the study and the patients were assured on top of the confidentiality of their privacy information. Alternatively a complete agreement of MS society was obtained.

### **Results**

According to achieved data 49.1%, 37.3% were married and housekeeper, respectively. 57.3% had average economic status and 21% of patients had children. A total of 55.5% of

respondents have been cited fatigue as the most important problem (Table 1).

The results showed that 6% of patients with multiple sclerosis are non-depressed and percentage of patients with mild, moderate and severe depression were 46%, 26% and 22%, respectively. In agreement with the findings, 94% of multiple sclerosis patients had also variable depression severity (mild to severe) (Table 2). Statistical tests showing no significant relationship between severity of

depression with factors such as age, gender, number of children, marital status, duration of illness, number of hospitalizations in the last year, the type of consumption drug, the type of MS and expanded disability status. On the other hand Spearman correlation test and regression test resulting significant relationship between severity of depression with level of education ( $p=0.008$ ), economic status of family ( $p=0.007$ ) and frequency of relapses in the last year ( $p=0.02$ ) (Table 3).

**Table 1: Frequency distribution of demographic characteristics and disease-related information of the study participants**

Variable	Number	Percent
Age(year)	20-28	31.8
	29-37	38.2
	38-45	30
Sex	Female	68.2
	Male	31.8
Marital status	Single	49.1
	Married	40.9
	Divorced	10
Education	Under high school diploma	10
	High school diploma	57.2
	Upper high school diploma	37.3
Relapse frequency during last year	Without relapse	.
	Once	.
	Twice	.
	More than twice	.
Hospitalization frequency during last year	Without hospitalization	.
	Once	.
	Twice and more	.
Length of disease (year)	1-5	.
	6-10	.
	11-20	.
Type of drugs	Moderator	.
	Symptomatic	.
	Synthetic	.
Type of MS	Not type of drug	.
	Relapse- Remitting	.
	Secondary Progressive	.
	Primary progressive	.
Disability expanded status	0-1.5	.
	2- 3.5	.
	4- 5.5	.

**Table 2: Frequency distribution, mean and standard deviation of the depression rate in multiple sclerosis patients**

Depression level	Frequency	Number	Percent
No Depression (0 – 9)			
Mild (10 – 18)			
Moderate (19 – 29)			
Severe (30 – 63)			
Sum			
Mean ± SD			12.37 ± 21.36

**Table 3: Relationship between multiple sclerosis patients' depression and their individual characteristics**

Individual demographic	Education (Spearman test)	The family Economic situation (Regression test)	Relapse frequency during last year (Regression test)
Depression	p = 0.008 df = 6	p = 0.007 df = 9	p = 0.02 df = 8

### Discussion

The analyzed data showed the majority of patients with multiple sclerosis had some degrees of depression and approximately one-fifth of participations suffering from severe depression. Several studies have confirmed the high rate of depression in patients with multiple sclerosis (18,19). MS patients due to several reason including the disease unpredictability, treatment process, the MS recurrent attacks, reducing ability of former and other problems such as job loss and side effects of administrated medications. Depression is a common reported mental disorder which has been associated with higher rates of suicidal incentive and risk of suicide (3,6,8).

Patten et al. and Sadovnik et al. reported that depression is common problems in MS patients. And risks of depression in MS patient have risen over 50% in their lifetime (1). Depression due to lack of predictability and disability in MS patients is considered as early

and secondary symptoms of multiple sclerosis. However, it should be noted that depression is not solely causes of destruction and functional disorder in patients (20), although there is enough evidence showing depression can exacerbate the inflammatory response in MS (20). Brown et al. reported prevalence of depression in MS patients of 23-54% (19). Many studies confirm the relation between of depression and chronic physical illness. Koike et al. during over 6-12 months surveillance on 1356 patients in America established that rate of depression in human with physical illness was significantly higher than rest of people and confirmed that more than 43% of people with physical illness were depressed (22). Therefore, according to achieved data from variety of researches, depression in MS patients needs to be considered and try to be control.

In the current study, despite the high rates of depression in MS patients and considering the depression as serious problem, but there was

no statistically significant association with depression against the majority of the demographic factors. The sample size could be one reason for this event. Another reason might be refers to homogeneous samples in the considered variables. Ghaffari et al. did not found significant relationship between depression and sex, age, marital status, education, income, type of MS, duration of disease and type of consumption medication (14). Patten et al. did not also observe noticeable association between mentioned variables with depression in MS patients (21). In the present study, the authors did not found significant relationship between depression and disability status of patients, while Ghaffari et al and Cicil and Johnson reported significant relationship between depression and disability status (14). Maybe one reason to this contradiction is due to low score of disability status (0-1.5) in participating MS patients. Patton et al. showed there was a significant relationship between depression and age of MS patients so that history of major depression in MS patients were under 35 years old was significantly more than older people (24). In the present study, most patients were in the age ranges of 20-28 years old and the number of persons in other age groups were very low so lack of a significant association between depression and age could be because of the sample size. Zabag et al. concluded risk of major depression in patients with primary progressive MS, was low compared with patients having relapsing-remitting form of MS in their lifetime (24) the mentioned results were disagreement with results obtained from the present study. In the current study the majority of patients had relapsing–remitting

form of MS and only 6.4% of patients suffered from primary progressive form.

In agreement to achieved data only three variables including education level, number of relapses during the last year and the family's economic status had significant relationship with depression. The patients with higher education showed elaboration depression scores and it should be should be considered that in the current study only %10 of patients were under high school. It should also be noted that the another reason the rate of multiple sclerosis is in early adulthood and middle age. Koike et al. reported significant relationship between level of education and depression in patients with chronic physical illness which is in agreement with the results of the current study (20). However, in patients with chronic disease by onset in adulthood there was not remarkable association with level of education and depression (1). Medanloo et al. did not found relationship between education and depression in hemodialysis patients (1). Another obtained data showed significant relationship between depression and the number of relapses and the economic situation of the family. Patients with recurrent disease indicated more than twice in a year and low income showed higher depression. The possible reason is increasing the frequency of relapses and elevation of hospital costs, especially for patients with low income that is consistent with results of Halper that observed significant relationship between depression and frequency of relapses in MS patients (25). One reason of low income in MS patients and following depression is negative impairment of physical and functional ability due to several factors such as impaired mobility, cognitive variations, mood swings,

impaired motor function, vision problems and urine control (26). Homogenous demographic variables which identify rates of depression and related factors were the positive points of this study. With regards to high rate of depression in MS patients, further study with larger numbers of patients with objective to recognize more associated factors such as stress and anxiety is recommended in future researches.

Limitations of current study were cultural and socioeconomic differences in patients, data collection methods, number of samples, sampling method and psychological condition of the patients during the study. Therefore, to confirm the present results, further study regardless mentioned limitations is required.

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## Conclusion

Based on given results, the majority of patients with multiple sclerosis showed evidence of degree of depression. The data suggest that depression in MS patients was common and serious. In multiple sclerosis extra to threaten of the health and relapse of MS exacerbations, depression could affect quality of life.

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