

# The Connection between Coping Mechanisms, Depression, Anxiety and Fatigue in Multiple Sclerosis

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## ABSTRACT

*The aim of this study was to show how different coping mechanisms influence the prevalence of anxiety and depression in people suffering from multiple sclerosis. We also aimed at showing how different coping mechanisms contribute to subjective prosperity of the patients emphasizing general health, cognitive functions and fatigue. A questionnaire was given to attendants of the VI Symposium of Patients Suffering From Multiple Sclerosis. Scales were taken from Multiple Sclerosis Quality of Life Inventory (MSQLI), Hospital Anxiety and Depression Scale (HADS) and COPE inventory. A total of 68 anonymous questionnaires were handed in. A total of 57.9% of examinees had symptoms of depression, and 63.2% suffered from symptoms of anxiety. However, majority of the examinees suffered from the combination of these entities. Hypothesis about impact of various coping factors on depression, anxiety, fatigue was validated except an impact on physical state was not proven significant. Predictors improving these states were positive reinterpretation, social emotional support and humor, Predictors worsening these states were planning, acceptance, focus on emotional ventilation and denial. Psychiatric comorbidity has a high prevalence in people suffering from MS. Different coping mechanisms can help in improvement of everyday life.*

**Key words:** multiple sclerosis, depression, anxiety, cope mechanisms, fatigue

## Introduction

Multiple sclerosis is a chronic demyelization disease of central nervous system leading to various focal neurological deficits. This disease is characterized by unpredictable and mutilating progression towards invalidity. Higher prevalence of psychiatric disorders in this group of patients has been confirmed by numerous studies<sup>1-3</sup>. But this problem has been underestimated in medical research and everyday clinical practice. Even the British Medical Journal editorial »Multiple sclerosis, depression, suicide: clinicians should pay more attention to psychopathology« has stated several concerns about little progress being made in this area of multiple sclerosis<sup>4</sup>.

There are two major proposed mechanisms of pathogenesis of psychiatric disorders in multiple sclerosis. First theory proposes that depression and anxiety are direct consequence of disease's activity; therefore these disorders are caused by demyelization lesions in certain areas of brain. Several authors have suggested that left frontal and temporal lesions and global atrophy of gray and white matter contributes to development of psychiatric comorbidity in multiple sclerosis<sup>5-6</sup>. These studies show only preliminary data and were carried on small sample of patients suffering from multiple sclerosis, therefore evidence for demyelization pathogenesis of depres-

sion is somewhat scarce. Second theory implies that psychiatric comorbidity is a result of maladaptive reaction to the disease. The individual diagnosed with multiple sclerosis is facing invalidity, social deterioration and as a consequence to dire social, psychological and physical changes is at higher risk of developing anxiety and mood disorders. Multiple sclerosis due to its relapsing and chronic course causes high number of stressful life events leading to susceptibility to these psychiatric disorders.

The main purpose of this study is to evaluate the role of various coping mechanism in psychiatric comorbidity in patients suffering from multiple sclerosis. We hypothesize that certain maladaptive coping mechanisms such as denial or avoidance are used by individuals suffering from depressive and anxiety disorders and, therefore, this coping strategies could have a role in pathogenesis of psychiatric disorders in this population. Other objects of our study are to show the connection of various maladaptive coping mechanisms with other multiple sclerosis symptoms such as fatigue, cognitive deficits and physical health.

## Subjects and Methods

The questionnaire was given to the attendants of VI<sup>th</sup> Symposium of Individuals Suffering from Multiple Sclerosis. 150 participants were randomly chosen and given the questionnaire to fill in. 68 subjects responded. The testing was anonymous. There was no possibility of reviewing their medical data or performing neurological examination. 75.7% of participants were female, 14.7% male, for other the sex is unknown. Male to female ratio is 5:1 which is consistent with current epidemiological data for multiple sclerosis in Croatia<sup>7</sup>. We divided sub-

jects in three different age groups; first group consisting of subjects 20–29 years old, second group including subjects 30–55 years old and third group consisting of subjects 56–80 years old. As expected, majority of subjects (63.2%) belonged to second group which is consistent with multiple sclerosis epidemiological data.

The questionnaire consisted of 150 questions. The first part was general questionnaire in order to acquire basic social and demographic data; age, sex, age of diagnosis, education etc. Second part included several psychometric taken from Multiple Sclerosis Quality of Life Inventory<sup>8</sup>. These scales were Health Status (SF36), Modified Fatigue Impact Scale (MFIS) and Perceived Deficits Questionnaire (PDQ). SF36 questionnaire assesses 8 dimensions of health, varying from physical roles to mental health. It was derived from General Health Survey of the Medical Outcomes Study<sup>9</sup> and modified for multiple sclerosis population. It consists of 31 items and 8 various subscales. MFIS measures an impact of fatigue on everyday life in multiple sclerosis and various subscales of fatigue such as physical, psychosocial and cognitive fatigue. MFIS consisting of 21 items has a range of score from 21 to 105 points. Cutoff values for this scale do not exist. The higher score signifies the greater impact of fatigue on subject's activities. PDQ is a measure assessing self reported cognitive deficits varying from concentration to retrospective and prospective memory. It consists of 20 items. Score ranges from 20 to 100, with higher score signifying the greater perceived cognitive dysfunctions. Third part consisted of Hospital Anxiety and Depression Scale<sup>10</sup> (HADS), a psychometric instrument used to detect depression and anxiety disorders. It consists of 14 items, 7 items for anxiety and 7 items for depression. Total score for each subscale ranges

**TABLE 1**  
DESCRIPTIVE DATA ABOUT COPE MECHANISM USED BY MULTIPLE SCLEROSIS PATIENTS

Coping mechanisms	$\bar{X}$	SD	C	D	v	Range	Min	Max
Positive reinterpretation and growth	13.27	1.88	14.00	14.00	3.53	8.00	8.00	16.00
Mental disengagement	10.67	2.51	11.00	9.00	6.30	12.00	4.00	16.00
Focus and venting of emotions	11.88	2.32	12.50	13.00	5.40	8.00	8.00	16.00
Use of instrumental social support	11.92	2.55	12.00	13.00	6.54	10.00	6.00	16.00
Active coping	12.52	1.76	12.00	12.00	3.11	8.00	8.00	16.00
Denial	9.50	2.92	10.00	10.00	8.53	12.00	4.00	16.00
Religious coping	12.25	4.83	13.50	16.00	23.29	25.00	4.00	29.00
Humor	11.73	2.60	12.00	12.00	6.79	11.00	5.00	16.00
Behavioral disengagement	9.67	2.80	10.00	10.00	7.87	12.00	4.00	16.00
Restraint	11.47	2.38	12.00	13.00	5.68	10.00	6.00	16.00
Use of emotional social support	11.57	2.83	12.00	13.00	8.06	12.00	4.00	16.00
Substance use	6.94	2.20	6.00	6.00	4.84	12.00	4.00	16.00
Acceptance	13.44	2.49	14.00	16.00	6.21	10.00	6.00	16.00
Suppression of competing activities	10.71	2.36	11.00	9.00	5.61	11.00	5.00	16.00
Planning	12.62	2.40	13.00	14.00	5.78	10.00	6.00	16.00

$\bar{X}$  – mean, SD – standard deviation, C – central value, D – dominant value, v – variance, Min – minimal value, Max – maximal value

from 0 to 21. Subjects, who score from 8 to 12 points, suffer from borderline mood disorder, and those who score above 12 points have definitely acquired either depression or anxiety or both. Last part consisted of COPE inventory, a questionnaire used to measure the use of various cope strategies. It consists of 14 various scales (each having 4 items, 56 items in total) measuring different coping mechanisms (Table 1). There are no cutoff values for each scale. Subjects were instructed to describe their cope mechanisms concerning multiple sclerosis and all stressful situations as a result from the disease.

After all data was collected, basic descriptive data was derived. To test our hypothesis of various cope mechanisms as predictor variables of scores on Hospital Anxiety and Depression Scale, Modified Fatigue Impact Scale, Perceived Deficits Questionnaire and Health Status Questionnaire, multiple regression analysis was performed. All statistical analyses were performed with the Statistical Package for Social Sciences for Windows, ver. 15.0 (SPSS Inc., Chicago, IL, USA). The level of statistical difference was set at  $p < 0.05$  or  $p < 0.001$ , as indicated.

## Results

Basic descriptive data of usage of different cope strategies is shown in table 1. Subjects have highest score in these subscales: »acceptance« (mean  $[\bar{X}] = 13.27$ , standard deviation  $[SD] = 1.88$ ), »positive reinterpretation and growth« ( $\bar{X} = 13.27$ ,  $SD = 1.88$ ). Generally, there is no predominating cope strategy used by subjects. Furthermore, subjects seem to employ both problem-focused and emotion-focused cope mechanisms equally. In reviewing these results, it must be accounted that no specific cut off score for COPE inventory exists.

**TABLE 2**  
FREQUENCIES OF DEPRESSIVE AND ANXIETY DISORDERS IN MS PATIENTS

Depression	Anxiety			Total
	Do not suffer from	Borderline	Suffer from	
Do not suffer from	17 (29.80%)	5 (8.80%)	2 (3.50%)	24 (42.10%)
Borderline	4 (7.00%)	6 (10.50%)	7 (12.30%)	17 (29.80%)
Suffer from	0 (0.00%)	1 (1.80%)	15 (26.30%)	16 (28.10%)
Total	21 (36.80%)	12 (21.10%)	24 (42.10%)	57 (100.00%)

The frequencies of depression and anxiety measured by HADS are shown in Table 2. Only 29.80% of subjects do not show symptoms of anxiety nor depression, with majority of subjects (50.9%) showing the symptoms of both affective and anxiety spectrum disorders. None of the subjects suffers from isolated depression. In average, subjects have scored more on anxiety ( $\bar{X} = 9.14$ ,  $SD = 4.83$ ) than on depression subscale ( $\bar{X} = 8.12$ ,  $SD = 4.32$ ) with maximum score on each subscale of 20.

Several coping strategies have been identified as predictor variables for depression as shown in Table 3. These are »positive reinterpretation and growth« ( $B = -0.90$ ;  $p = 0.030$ ), »humor« ( $B = -0.76$ ;  $p = 0.015$ ) and »religious coping« ( $B = 0.61$ ;  $p = 0.015$ ). With this set of predictors 65.8% of variance of depression was explained ( $R^2 = 0.658$ ). The hypothesis on impact of various cope mechanisms on depression was confirmed.

**TABLE 3**  
COPING MECHANISMS AS PREDICTOR VARIABLES OF DEPRESSION

Coping mechanisms	B	SE	$\beta$	t	p
Positive reinterpretation and growth	-0.90	0.39	-0.38	-2.33	0.030*
Mental disengagement	-0.03	0.29	-0.02	-0.12	0.908
Focus and venting of emotions	0.00	0.30	0.00	0.00	0.996
Use of instrumental social support	0.05	0.41	0.03	0.12	0.904
Active coping	-0.08	0.62	-0.03	-0.12	0.904
Denial	0.39	0.28	0.28	1.40	0.177
Religious coping	0.01	0.19	0.01	0.06	0.955
Humor	-0.76	0.29	-0.49	-2.64	0.015*
Behavioral disengagement	0.15	0.26	0.10	0.56	0.584
Restraint	-0.25	0.43	-0.13	-0.59	0.563
Use of emotional social support	-0.36	0.28	-0.24	-1.29	0.212
Substance use	0.21	0.41	0.11	0.51	0.615
Acceptance	0.67	0.34	0.35	1.94	0.065
Suppression of competing activities	-0.32	0.43	-0.16	-0.74	0.465
Planning	0.61	0.31	0.35	1.97	0.062

\*statistical significance at level  $p < 0.05$

**TABLE 4**  
COPING MECHANISMS AS PREDICTOR VARIABLES OF ANXIETY

Coping mechanisms	B	SE	$\beta$	t	p
Positive reinterpretation and growth	-0.22	0.37	-0.09	-0.61	0.548
Mental disengagement	-0.18	0.28	-0.10	-0.67	0.512
Focus and venting of emotions	0.37	0.28	0.19	1.31	0.205
Use of instrumental social support	-0.35	0.39	-0.19	-0.91	0.374
Active coping	0.21	0.62	0.07	0.33	0.741
Denial	0.54	0.26	0.36	2.06	0.050
Religious coping	0.11	0.18	0.08	0.57	0.572
Humor	-0.58	0.28	-0.35	-2.10	0.048*
Behavioral disengagement	0.63	0.25	0.40	2.54	0.019*
Restraint	-0.22	0.41	-0.11	-0.55	0.590
Use of emotional social support	-0.53	0.26	-0.33	-2.02	0.057
Substance use	-0.11	0.39	-0.06	-0.29	0.778
Acceptance	0.46	0.33	0.22	1.40	0.175
Suppression of competing activities	-0.18	0.40	-0.09	-0.44	0.661
Planning	0.58	0.29	0.31	1.98	0.048*

\*statistical significance at level  $p < 0.05$

In Table 4, coping mechanisms as predictors of anxiety are shown. Five predictors were statistically significant; »denial« ( $B=0.54$ ;  $p=0.050$ ), »humor« ( $B=-0.58$ ;  $p=0.048$ ), »behavioral disengagement« ( $B=0.63$ ;  $p=0.019$ ), »planning« ( $B=0.58$ ;  $p=0.048$ ). Whole set of predictors explained the 74.8% of variance ( $R^2=0.748$ ). The hypothesis on connection between cope strategies and anxiety was confirmed.

Subjects averagely scored 70.03 points ( $SD=10.26$ ), and 50% of subjects scored more than 71 points on MFIS.

This score signifies high impact of fatigue in this group. After multiple regression analysis, three cope mechanisms were proven to be statistically significant: »positive reinterpretation and growth« ( $B=-3.17$ ;  $p=0.009$ ), humor ( $B=-2.83$ ,  $p=0.003$ ) and »acceptance« ( $B=1.92$ ;  $p=0.046$ ). Whole set of predictors, as shown in Table 5, explains 66.4% of variance ( $R^2=0.650$ ).

Average score on PDQ was  $\bar{X}=52.42$ , with 50% subjects scoring more than 52. Although no cutoff values are

**TABLE 5**  
COPING MECHANISM AS PREDICTOR VARIABLES OF FATIGUE

Coping mechanisms	B	SE	$\beta$	t	p
Positive reinterpretation and growth	-3.17	1.13	-0.40	-2.79	0.009**
Mental disengagement	-0.30	0.90	-0.05	-0.34	0.734
Focus and venting of emotions	0.89	0.94	0.14	0.95	0.347
Use of instrumental social support	0.17	1.18	0.02	0.14	0.885
Active coping	-2.39	1.67	-0.26	-1.40	0.163
Denial	1.23	0.82	0.25	1.49	0.147
Religious coping	0.41	0.46	0.11	0.88	0.384
Humor	-2.83	0.88	-0.52	-3.20	0.003**
Behavioral disengagement	0.80	0.76	0.15	1.05	0.299
Restraint	0.57	1.18	0.09	0.48	0.631
Use of emotional social support	-0.32	0.84	-0.06	-0.38	0.706
Substance use	-1.46	1.17	-0.22	-1.25	0.221
Acceptance	1.92	0.91	0.33	2.09	0.046*
Suppression of competing activities	1.72	1.15	0.28	1.48	0.149
Planning	1.55	0.97	0.26	1.59	0.123

\*statistical significance at level  $p < 0.05$ ; \*\*statistical significance at level  $p < 0.01$

available, it can be concluded that a high level of self-reported cognitive deficits exists in this group. Several cope strategies were statistically significant; focus on and ventilation of emotions ( $B=1.99$ ;  $p<0.05$ ), use of emotional social support ( $B=-2.87$ ;  $p<0.05$ ) and planning ( $B=2.71$ ;  $p<0.05$ ). Whole set of predictors explain 65% of variance ( $R^2=0.650$ ).

After multiple regression analysis, significant predictors for subscales describing the physical status of status were not found. Only for vitality scale and mental health there were statistically significant predictor variables.

## Discussion

Traditionally, coping strategies are divided in two mayor groups: problem-focused coping and emotion-focused coping<sup>12</sup>. The use of specific mechanism highly depends on the stressor itself and use of emotion-focused coping is often connected with disease-related stressors. Although some authors suggest that coping toward multiple sclerosis-related stressors is generally emotion-focused<sup>13</sup>, our study suggests that both types of mechanisms are expressed in this population, although this distinction is sometimes too simplistic<sup>11</sup> not emphasizing the importance of adaptive/maladaptive cope strategies.

Other studies report using structured psychiatric interviews similar occurrence of depressive symptoms<sup>14–16</sup> to our results. We could have overestimated the occurrence of depression and anxiety due to use of HADS, although goal of this study is not to estimate prevalence of mood disorder in multiple sclerosis. Major advantage of the study is that our subjects form community sample unlike most of other studies. Similar results were obtained for anxiety using HADS in a study by Smith et al.<sup>17</sup>. This study confirms the significance of psychiatric comorbidity in MS population leading to a suicide rates 7.5 higher than in normal population<sup>18</sup>.

Planning as clearly problem-focused cope mechanism leading to active coping has been connected with both depressive and anxiety symptoms and is obviously maladaptive in MS subjects. The reason for this remains unknown. Authors propose that the mutilating effect of multiple sclerosis abrupt the process of execution of strategies mentally planned, therefore leading to reactive frustrations and feeling of self helplessness increasing the chance of developing the mood or anxiety disorder. The use of humor as emotion-focused mechanism has shown to be protective for subjects against depression, anxiety and fatigue clearly being one of the most adaptive cope strategies in this population. This mechanism could be used in been shown to be protective cope mechanism against anxiety and fatigue. Through secondary reappraisal, this strategy leads to active coping and reduction of stress, therefore reduces the level of depressive symptoms. Our study has indirectly shown through similar cope strategies connection between depression and multiple sclerosis fatigue. It is important to state that some aspects of fatigue in this population may be contributed to mood disorder, although the pathogenesis

of fatigue remains unknown as confirmed in other studies<sup>19,20</sup>. The importance of cope strategies in fatigue has also been confirmed by finding significant predictors of vitality, an independent measure of fatigue. In most of fatigue syndromes cognitive-behavioral therapy changing maladaptive cope strategies towards adaptive was found beneficial, although no study was performed in treatment of multiple sclerosis fatigue<sup>21</sup>. Surprisingly, denial was connected only to the anxiety as a significant predictor, neither to the depression nor fatigue. Universally, these cope mechanism is found as maladaptive leading to absence of active coping through the mechanism of denying of the existence of the stressor. Also, a mechanism opposite of denial, acceptance was found to be connected with fatigue. PDQ scale by some authors has lower correlation with objective neuropsychological scale, but this questionnaire can also be used to evaluate the role of depression on cognitive deficits<sup>8</sup>. By DSM VI<sup>22</sup> psychomotoric retardation is one of the criteria for MDD, and therefore PDQ scale could be used to assess this issue. We found several significant predictors connected to cognitive dysfunction; focus on emotions and planning while use of emotional social support was protective. Surprisingly, two major emotions focused coping mechanism are connected with cognitive deficits. Lack of objective neuropsychological testing disables this study of making connection assumptions about connection between cognitive deficits and cope strategies.

Furthermore, this is yet another study which confirms lack of association between cope mechanisms and physical scale. Though we used self reported questionnaire SF36, a particular subscale »role physical« correlates well with Extended Disability Status Scale (EDSS)<sup>8,23,24</sup>. This has been validated by some studies, although there are contradictory data in this research field<sup>25–27</sup>. We conclude that probably coping mechanism do not exert their effects on neurological dysfunction in patients suffering from multiple sclerosis, although that does not diminish their importance in this disorder. Furthermore, several authors have connected that higher number of everyday stressors increase the number of relapse and that several cope mechanisms such as the use of emotional social support decreases the number of relapses<sup>28,29</sup>.

As shown in this study, coping mechanisms are associated with depression, anxiety and fatigue in multiple sclerosis. The use of this approach could serve well in cognitive behavioral therapy of these patients. This study emphasizes that switch from maladaptive cope mechanisms to adaptive ones such as humor, positive reinterpretation and growth or use of emotional social support. It is interesting that most of »problem focused« strategies haven't proven to be beneficial in psychiatric comorbidity and psychological distress perhaps due to a fact that multiple sclerosis is constant stressor. Furthermore, it points that cognitive behavioral therapy could be used more often in dealing with multiple sclerosis patients to reduce the psychiatric comorbidity. The need for further research in this area is obvious, but still remains somewhat scarce. In one meta-analysis on effective treat-

ment of mood disorders in multiple sclerosis, only five studies were eligible to enter with final results showing

that cognitive-behavioral therapy focused on appropriate coping skills remains the treatment of choice<sup>30</sup>.

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## POVEZANOST IZMEĐU MEHANIZMA SUOČAVANJA, DEPRESIJE, TJESKOB E I OSJEĆAJA UMORA KOD PACIJENATA OBOLJELIH OD MULTIPLE SKLEROZE

### SAŽETAK

Cilj ovog rada bio je prikazati kako različiti mehanizmi suočavanja utječu na psihofizičko stanje (umor, kognitivne disfunkcije, opće fizičko i emocionalno stanje) te na pojavu anksioznih i depresivnih poremećaja u bolesnika koji boluju od multiple skleroze. Upitnik koji se sastojao od ljestvica preuzetih iz Multiple Sclerosis Quality of Life Inventory (MSQLI), Hospital Anxiety and Depression Scale (HADS) i COPE inventory, podijeljen je sudionicima VI. Simpozija oboljelih od multiple skleroze. Vraćeno je 68 anonimno ispunjenih upitnika. Ukupno 57,9% ispitanika pati od simptoma depresije, a 63,2% uzorka ima simptome anksioznosti. Dokazana je hipoteza o utjecaju različitih mehanizama suočavanja na depresiju, anksioznost, kognitivnu disfunkciju i umor, izuzev utjecaja na fizičko stanje. Prediktori koji smanjuju navedena stanja su pozitivna reinterpetacija, humor i emocionalna socijalna potpora. Prediktori koji pogoršavaju navedena stanja su planiranje, prihvaćanje i negiranje. Provedenim istraživanjem uspjeli smo dokazati da je stopa psihijatrijskog komorbiditeta u oboljelih od multiple skleroze značajna te da različiti mehanizmi suočavanja mogu pridonijeti, ali i otežati, postizanje psihofizičkog boljitka. Također, pokazali smo da je umor značajan čimbenik bolesti i da se pozitivnim mehanizmima suočavanja može umanjiti.