



A Comparative Study of Emotional Regulation, Quality of Life, and Resilience in Patients with Multiple Sclerosis and Healthy People

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Abstract

Background: Multiple sclerosis (MS) is a chronic and autoimmune disease, which the prevalence of it is increasing every day. This disease not only have destructive effects on people's physical health but also influences their mental health. In this regard, special attention should be paid to this disease, its incidence factors, its therapeutic approaches, and reducing its detrimental effects.

Objectives: This study aimed to perform a comparative study of emotional regulation, quality of life, and resilience in patients with MS and healthy subjects.

Methods: This correlational study followed by a causal-comparative design. The current study had a sample population consisting of 100 individuals (50 patients with MS and 50 healthy subjects) were selected using a convenient sampling method. To collect data, Ibanez et al. Emotional self-regulation inventory, Ware and Sherbourne quality of life questionnaire, and Connor and Davidson resilience scale were used. Data were analyzed using a Pearson correlation coefficient and a stepwise regression analysis.

Results: Regarding emotional regulation, quality of life, and resilience, the results of a MANOVA and a *t*-test showed that there were statistically significant differences between the patients with MS and healthy subjects ($P < 0.05$).

Conclusions: Given the results which indicated the differences in emotional regulation, quality of life, and resilience between the MS patients and healthy subjects; paying attention to these aspects of MS patients' lives and trying to improve them are highly recommended.

Keywords: Emotional Regulation, Quality of Life, Resilience, MS Patients

1. Background

Multiple sclerosis (MS) can be regarded as the most prevalent central nervous system disease (1) and as the third most common cause of nervous disabilities, which affects a number of women and men in young ages (2). This is an irreversible disease that has various clinical manifestations in different people. Subsequently, the major clinical manifestations of this disease are fatigue, motor disorders, visual deficits, sensory disturbances, cognitive defects, and psychological changes (3). The MS reaches its peak between the ages of 20 to 30 years and it is more prevalent in females compared with their male counterparts (4). The exact cause of this disease is still unknown; however, there are several possible factors involved in the development of this disease, including atmospheric conditions, stress, heredity, immunodeficiency, self-immune mechanisms, and environmental factors, especially viral infections (5). Based on a statistic coming from the MS Association, nearly 40,000 people suffer from MS in Iran

(6). Although decreased memory, decreased concentration, dysfunctions in reasoning, and depression are among other symptoms of this disease, the patients do not suffer from all these symptoms and they may suffer from one symptom or more. Accordingly, the severity of each symptom may vary from weak to severe (7). Considering physical and mental issues caused by this disease, the patients' quality of life alters and can be significantly affected by patients' mood, personality, and adaptability patterns (8). Thus the inability caused by MS influences patients' quality of life (9). Physical, psychological, social, and economic aspects associated with patients' quality of life are significantly changed; consequently, their quality of life is strongly influenced by the disease (10). Quality of life indicates a person's degree of enjoyment of the possibilities in life and shows his/her satisfaction with such possibilities. Health-related quality of life refers to physical, psychological, and social aspects that are influenced by experiences, beliefs, expectations, and perceptions of an individual (11). Nejat et al. (12) investigated the quality of life of patients

with MS and compared it with that of a healthy population. Their results demonstrated that the MS patients' quality of life was lower than that of the healthy subjects in all aspects. Abbasi et al. (13) examined the effect of disability and depression on MS patients' quality of life. Their results indicated that the MS patients' quality of life score was lower than that of the healthy subjects. In other words, disability and depression led to a decrease in these patients' quality of life.

When a patient's quality of life decreases, this reduction affects his/her mastery over his/her emotions and this can disrupt the patient's emotional regulation. Emotions are complicated and multidimensional components that prepare a person for acting and reacting to events and contains six main components, i.e. cognitive assessment, mental experience, communication, internal-physical response, facial expression, and a person's response to emotions. These six components together are regarded as emotions (14). Emotional regulation refers to creating thoughts and beliefs that make people aware of the different types of emotions they have, the time they feel such emotions, and the ways of expressing them. Emotions have a high quality such that they can cause a positive or negative reaction in people. When emotion is in accordance with a situation it creates a positive reaction; otherwise, it causes a negative reaction in people. Accordingly, when emotions are intense or prolonged and/or do not meet the requirement, there is a need to adjust them (15). Landro et al. (16) studied emotional changes in the early stages of MS disease in patients. Their results indicated that the patients with MS had a high level of sensitivity and disability to regulate their emotions at the early stages. The inability to regulate emotions lowers a person's threshold of tolerance and results in low resilience. Resilience is a dynamic process that strikes a balance between risk factors and internal in addition to external conservative factors, which helps people get rid of adverse outcomes of life (17). Resilience is the ability to change regardless of different existing threats. Basically, people have complex and diverse needs that naturally cause resilient for them when faced with a disaster. Whenever basic needs are met, the resilience emerges. After the emergence of resilience, adverse effects are moderated and may even disappear (18). Resilience improves the ability to recover, optimism, intellectual skills, flexibility, and the search for problems in order to have opportunities for learning; increasing perseverance, endurance, and self-esteem; developing emotional and supernatural abilities; and improving independence and self-respect in patients (19). Silverman et al. (20) examined resilience among patients with MS. Their results showed that patients with MS have low resilience. The levels of resilience in patients with MS are also influenced by

their disease. Resilience is among important factors that the improvement of it should be taken into consideration. Improving resilience results in positive consequences despite the existence of adverse and unpleasant experiences. In other words, in adverse conditions, displaying a positive post-traumatic reaction is very important (20).

2. Objectives

According to what was mentioned earlier, this study sought to answer the following research question: Are there any significant statistical differences in emotional regulation, quality of life, and resilience between patients with MS and healthy subjects?

3. Methods

3.1. Methods of Carrying Out the Study, Statistical Population, and Sample

This correlational study followed by a causal-comparative design. The current study had a statistical population, including all patients with MS referred to Zahedan MS Association in 2018. The sample population consisted of 100 patients (50 patients with MS and 50 healthy subjects) who were selected using a convenience sampling method.

3.2. Data Collection Tools

3.2.1. The Self-Regulation Scale (SRI-25)

This scale includes 25 items and measures self-regulation based on five subscales, i.e. positive actions, controllability, expression of feelings and needs, assertiveness, and well-being seeking. The items are scored based on a 5-point Likert-type scale (ranging from 1 = very low to 5 = very high) and items 6, 9, 12, 14, 16, and 19 are scored diversely. A participant's minimum score on this scale is 25 and a maximum score is 125. Higher scores indicate higher levels of emotional regulation. Its Cronbach's alpha coefficients ranged from 0.68 to 0.84 and the internal consistency of this scale was confirmed (21). To validate its Persian form, a study was conducted on a sample of students ($n = 827$) and its Cronbach's alpha coefficient was obtained 0.93, which showed its high internal consistency (1). The validity of this scale was also confirmed by assessing the correlation coefficient of scores obtained from 140 students on the self-regulation Scale with mental health inventory scales and self-esteem rating scale students (1).

3.2.2. The Quality of Life Questionnaire (PedsQL)

This questionnaire was developed by Ware and Sherbourne (1992) in the USA and has been translated into various languages. Evidence has shown that this questionnaire had a good validity and reliability in different populations (22). It assesses eight different health-related domains and considers two general physical and mental subscales. The components associated with the physical subscale are physical functioning, role limitations due to physical issues, physical pain, and general health. Furthermore, the components associated with the mental subscale are role limitations due to emotional issues, emotional functioning, energy and vitality, and mental health. Higher scores obtained from a subject showed higher levels of quality of life. In Iran, this questionnaire was validated by Montazeri et al. (22) on a sample of 4063 people. The results of their study indicated that this questionnaire was reliable and valid. Montazeri et al. demonstrated that Cronbach's alpha coefficients of physical functioning, physical role, physical pain, and general health were 0.90, 0.85, 0.83, and 0.71, respectively; and Cronbach's alpha coefficients of emotional role, energy and vitality, emotional functioning, and mental health were 0.84, 0.65, 0.77, and 0.77, respectively. In a study conducted by Haj Hosseini and Hashemi (23), Cronbach's alpha coefficients of physical functioning, physical role, physical pain, and general health were 0.83, 0.83, 0.74, and 0.82, respectively, and Cronbach's alpha coefficients of emotional role, energy and vitality, emotional functioning, and mental health were 0.32, 0.68, 0.55, and 0.73, respectively.

3.2.3. The Resilience Scale (CD-RISC)

This scale is comprised of 25 items. Connor and Davidson (17) developed it by reviewing all the research resources on resilience available from 1979 to 1991. This scale is scored based on a 5-point Likert-type scale (ranging from 1= completely false to 5= completely true). Its highest score is 100 and its lowest score is 0. This scale was performed in six groups, including general population referred to a primary skills unit, outpatient psychiatric patients, patients with generalized anxiety disorder, and two groups of patients with post-traumatic stress disorders. The designers of this scale believe that this scale is well suited to distinguish between resilient and non-resilient people in clinical and non-clinical groups and it can be used in clinical and research settings. In Iran, to standardize the scale, Mohammadi (2005) determined its validity using a factor analysis based on a principal component analysis and indicated that its adequacy of sampling was 0.87 and its chi-square statistic corresponding to Barlett's test of sphericity was 28.5556. In addition, using the Cronbach's alpha coefficient, the reliability coefficient was calculated 0.89. In a

study conducted by Besharat (1), the validity and reliability of this scale were confirmed.

4. Results

The data presented in Table 1 show the means and standard deviations related to the patients with MS and healthy subjects.

Table 1. Means and Standard Deviations of the Subscales of Emotional Regulation, Quality of Life, and Resilience

Variables/Subscales	Mean \pm SD
Emotional regulation	
Positive actions	17.25 \pm 5.32
Controllability	16.57 \pm 4.93
Expression of feelings and needs	16.57 \pm 4.93
Assertiveness	16.38 \pm 4.57
Well-being seeking	17.70 \pm 5.64
Total emotional regulation	84.54 \pm 2.43
Quality of life	
Physical health	30.55 \pm 7.47
Mental health	32.11 \pm 9.22
Total quality of life	88.79 \pm 2.25
Resilience	58.57 \pm 1.39

To answer the following research question "is there a statistically significant difference in emotional regulation between the patients with MS and healthy subjects", the multivariate analysis of variance (MANOVA) was used.

In order to achieve reliable results, the following conditions should be met in such an analysis. One of the assumptions for carrying out the multivariate analysis of covariance is the homogeneity of variance-covariance matrices. To this end, Box's test of equality of covariance matrices was applied [(Box's M = 24.18, F = 1.52, P = 0.08 > 0.05)]. The P value of the Box's test is greater than 0.05; therefore, it can be concluded that the variance-covariance matrices are homogenous.

To investigate the homogeneity of variances in these two groups, Levene's test for equality of variances was used. The results of the Levene's test were not statistically significant for any of the variables in this study [positive actions F(1, 98) = 1.04, P = 0.30 > 0.05, controllability F(1, 98) = 3.43, P = 0.06 > 0.05, expression of feelings and needs F(1, 98) = 2.83, P = 0.09 > 0.05, assertiveness F(1, 98) = 0.65, P = 0.42 > 0.05, and well-being seeking F(1, 98) = 3.20, P = 0.07 > 0.05]. Accordingly, the assumption of the homogeneity of variances was confirmed and the following results would be stable.

Furthermore, another assumption is Wilks Lambda, the results of the multivariate analysis of variance demonstrated that there was a statistically significant difference in the means of the subscales of emotional regulation between the two groups, i.e. the patients with MS and healthy subjects ($F = 3.17$, Wilks Lambda = 0.05, $P = 0.05$). Hence, this statistically significant difference was in the subscales of emotional regulation between the two groups and the test power (0.94) also indicated the adequacy of the sample size and the size of the effect.

Therefore, by confirming all the three assumptions, the test could be carried out.

Results presented in Table 2 indicate the effects between the two groups and demonstrate that considering the value of observed F, there was a statistically significant difference in the subscales of emotional regulation between the patients with MS and healthy subjects ($P \leq 0.05$).

To answer the following research question “is there a statistically significant difference in the quality of life between the patients with MS and healthy subjects”, the multivariate analysis of variance (MANOVA) was used.

In order to achieve reliable results, in such an analysis the following conditions should be met. One of the assumptions for carrying out the multivariate analysis of covariance is the homogeneity of variance-covariance matrices. To this end, the Box’s test of equality of covariance matrices was applied [(Box’s $M = 1.80$, $F = 0.58$, $P = 0.62 > 0.05$)]. The p-value of the Box’s test is greater than 0.05; therefore, it can be concluded that the variance-covariance matrices are homogenous.

To investigate the homogeneity of variances in these two groups, the Levene’s test for equality of variances was used. The results of the Levene’s test were not statistically significant for any of the variables in this study [mental health $F(1, 98) = 1.73$, $P = 0.19 > 0.05$ and physical health $F(1, 98) = 3.18$, $P = 0.07 > 0.05$]. Accordingly, the assumption of the homogeneity of variances was confirmed and the following results would be stable.

Furthermore, another assumption is Wilks Lambda, the results of the multivariate analysis of variance demonstrated that there was a statistically significant difference in the means of the subscales of quality of life between the two groups, i.e. the patients with MS and healthy subjects ($F = 1.13$, Wilks Lambda = 0.29, $P = 0.05$). Hence, this statistically significant difference was in the subscales of quality of life between the two groups and the test power (0.70) also indicated the adequacy of the sample size and the size of the effect.

Therefore, by confirming all the three assumptions, the test could be carried out.

Results presented in Table 3 indicate the effects between the two groups and demonstrate that considering

the value of observed F, there was a statistically significant difference in the subscales of quality of life between the patients with MS and healthy subjects ($P \leq 0.05$).

To answer the following research question “is there a statistically significant difference in resilience between the MS patients and healthy people”, an independent *t*-test was used.

The results presented in Table 4 show a statistically significant difference between the patients with MS and healthy subjects ($t = 14.71$, $P < 0.05$). According to the means of the two groups, it can be concluded that healthy people’s mean of resilience was higher than that of the patients with MS. In other words, there was a statistically significant difference between patients with MS and healthy subjects.

5. Discussion

The current study was conducted with the aim of carrying out the comparative study of emotional regulation, quality of life, and resilience in patients with MS and healthy subjects. The findings of this study showed that there were statistically significant differences in emotional regulation, quality of life, and resilience between the patients with MS and healthy subjects. These findings are consistent with results of a number of studies (9, 12, 16, 24-26).

In explaining these findings, it can be noted that a patient with MS suffers from a chronic and severe condition that adversely affects many aspects of his/her life. Nevertheless, experiencing constant pain influences the patient’s emotions, such that the patient expresses his/her emotions using more negative strategies. This disease reduces the patient’s self-control and prevents him/her to make rational and reasonable decisions when faced with stress. In this way, the level of the patient’s sensitivity is elevated and, because of having a sense of frustration in recovery, the patient has negative thoughts and experiences a negative and cynical thinking style, which causes inappropriate emotional reactions such as impulsiveness.

Regarding physical and psychological issues caused by this disease, the patients’ quality of life alters and can be significantly affected by patients’ mood, personality, and adaptability patterns (8). MS patients do not enjoy life due to their continuous pain and they experience low levels of satisfaction and are not happy. In other words, the likelihood of the incidence of depression among these people is high and they experience low levels of psychological well-being. Moreover, patients restrict their relationships with others and are not likely to take part in social activities. Failure to control the complications of the disease also

Table 2. Results of the Multivariate Analysis of Variance of the Subscales of Emotional Regulation in the Two Groups of Patients with MS and Healthy Subjects

Variable	Sum of Squares	df	Mean of Squares	F	P Value	Etta-Squared
Group						
Positive actions	4186.09	1	4186.09	285.59	0.05	0.74
Controllability	5220.04	1	5220.04	245.93	0.05	0.71
Expression of feelings and needs	3588.01	1	3588.01	376.17	0.05	0.79
Assertiveness	1755.61	1	1755.61	218.19	0.05	0.69
Well-being seeking	2199.61	1	2199.61	233.16	0.05	0.70
Error						
Positive actions	1436.42	98	14.65	-	-	-
Controllability	1004.20	98	10.24	-	-	-
Expression of feelings and needs	934.74	98	9.53	-	-	-
Assertiveness	788.50	98	8.04	-	-	-
Well-being seeking	924.50	98	9.43	-	-	-

Table 3. Results of the Multivariate Analysis of Variance of the Subscales of Quality of Life in the Two Groups of Patients with MS and Healthy Subjects

Variable	Sum of Squares	df	Mean of Squares	F	P Value	Eta-Squared
Group						
Physical health	1142.44	1	1142.44	145.43	0.05	0.59
Mental health	1797.76	1	1797.76	116.85	0.05	0.54
Error						
Physical health	769.80	98	7.58	-	-	-
Mental health	1507.68	98	15.38	-	-	-

Table 4. Results of the t-Test Related to Resilience in the Patients with MS and Healthy Subjects

Resilience	Values
Levene	
F	21.10
P value	0.05
MS ^a	35.22 ± 3.25
Healthy ^a	50.64 ± 6.65
t	14.71
df	98
P value	0.05

^a Values are expressed as mean ± SD.

exacerbates negative effects on quality of life of these patients. Due to the changes in physical, mental, social, and economic aspects related to these patients' quality of life, these patients do not have a lot of energy to enjoy daily routine activities; consequently, their quality of life is decreased. This is why they do not benefit from high levels of quality of life and their quality of life is lower than normal

people. Also MS, due to its effects on physical and mental aspects of patients' lives and since it is a chronic and long-term disease, leads to a reduction in their resistance and makes it difficult for them to deal with the disease. In the long term, these obstacles lead to a low level of resilience.

5.1. Conclusions

The present study examined the differences in emotional regulation, quality of life, and resilience between the patients with MS and healthy subjects. In other words, the patients with MS have a lower level of emotional regulation, quality of life, and resilience than healthy subjects. Thus paying attention to these aspects of MS patients' lives and trying to improve them are highly recommended.

5.2. Limitations and Recommendations

Among limitations of the present study, some patients did not cooperate and some questions were not understandable to them. Also, this study was conducted among MS patients referring to the MS Society of Zahedan City and should be careful to generalize the results to other areas and cities. It is suggested that further studies should be

conducted and examine the effects of the disease on other aspects of mental health.

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Footnotes

Conflict of Interests: The authors declare that they have no conflict of interests.

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Patient Consent: After the necessary explanation for the patients, written informed consent was obtained from all the participants.

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