

DOI: 10.5455/msm.2016.28.215-219

Received: 23 February 2016; Accepted: 19 May 2016

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ORIGINAL PAPER

Mater Sociomed. 2016 Jun; 28(3): 215-219

# ASSOCIATION BETWEEN DISABILITY AND QUALITY OF LIFE IN MULTIPLE SCLEROSIS PATIENTS IN AHVAZ, IRAN

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## ABSTRACT

**Introduction:** Multiple Sclerosis (MS) is a neurodegenerative and chronic disease of central nervous system which affected the middle aged people. The disabling nature of this disease can limit the daily activities, restrict the society roles, unemployment and finally lead to decline the quality of life (QoL) in MS patients. So, the main purpose of this study was to determine association between disability and quality of life among MS patients in Ahvaz, Iran. **Materials and Methods:** One hundred and one MS patients who living in Khouzeestan participated in the cross-sectional study. Two questionnaires include the MSQoL-54 and World Health Organization disability assessment schedule 2.0 (WHODAS2.0) were used in order to measure the QoL and disability severity. Descriptive statistics as well as Pearson correlation coefficient and simple linear regression were used to analysis the data. **Results:** The respondent rate was 100 percent. The disability showed a large and negative association with QoL ( $p < 0.001$ ) but QoL was not significantly associated with EDSS score. Social participation and cognition subscales recognized as QoL predictors according to simple regression results. **Conclusion:** The cognition and participation, disability subscales, were the most important predicators for QoL. Therefore, increasing employment opportunities, changing society's attitude and using the psychotherapy programs might improve the MS patient's QoL.

**Key words:** Multiple Sclerosis, Quality of Life, Disability.

## 1. INTRODUCTION

Although more than 2.5 million in the worldwide are suffering from Multiple Sclerosis (MS), to date there has no certain treatment developed to deal with this neurological disabling disease. MS is a progressive, chronic, auto-immune and neurodegenerative disorder of Central Nervous System (CNS) that has appeared in middle aged people (1-3). Previous studies have reported that ambulatory impairment, limb numbness, vision loss, pain and fatigue are the most common symptoms of MS (1, 4-6). The disabling nature of this disease can limit the daily activities, restrict the society roles, unemployment and finally lead to drop the Quality of Life (QoL) in MS patients (5, 7, 8).

It seems that measurements in rehabilitation and disability sciences are concentrated more on assessing the body structure and function (impairments severity), while activity and participation assessment can be more significant, understandable and advantageous for both patients

and therapists, and moreover, the outcome measurements might have a more directly link to QoL (9, 10). So, evaluating the disability would prepare a comprehensive profile of health conditions and functioning level, and determine the QoL (8, 11).

World Health Organization (WHO) explained disability as existence of impairments, activities and society roles difficulties, as well as it might be affected by contextual factors (12). Prevalence rate of disability is increasingly growing (13); and previous research showed that the QoL can be affected by disability (14). Holmgren et al described that mobility disability can decrease QoL and limit the community participation (15). A study that carried out by Seto et al showed disability in self-care activities can decline the QoL in patients with heart failure (16). Moreover, recently studies demonstrated that unemployment (17), cognitive and physical disability (18, 19), and suffering from chronic diseases (20-22) such as MS can negatively influence the QoL (23). So,

this research aimed to determine the association between disability and quality of life the MS patients in Ahvaz.

## 2. MATERIALS AND METHODS

### Participants

One hundred and eight MS patients with equal and less than 6 EDSS who were inhabited in Khouzestan province (Iran), were literate invited to MS clinic in Ahwaz in order to participate in this cross-sectional study. Seven patients were excluded from the study because of orthopedic and neurologic diseases. First, all patients were informed completely about research aims and then signed in the ethical code "IR.AJUMS.REC.1394.195" form which confirmed by Ethic Committee of Jundishapour University of Medical Sciences.

### Instruments

#### MSQOL-54

In this study, Multiple Sclerosis Quality of Life- 54 questionnaire was applied to measure the QoL of people with MS. This standard and Likert type (from 2 to 7 options) instrument was developed according to Short Form-36 measurement (SF36) by Barbara Vickrey in California University in order to assess the physical and mental health of QoL the patients with MS and it is scored between 0-100 in which the lower score reflected the lower QoL. The instrument was cross-culturally adapted and the psychometric properties assessed in Iran by Ghaem et al (24-26). In addition, the psychometric features of the MSQoL-54 were measured in the present study and the results showed the test-retest reliability was 0.95, the instrument internal consistency was measured by Cronbach Alpha coefficient and that was 0.92 for MSQoL-54.

#### WHODAS2.0

This generic and self-administrated measurement has been designed for assessing the disabilities and functioning levels in last 30 days based on framework of International Classification of Functioning, Disability and Health (ICF) and it contains 6 subscales: Cognition, Mobility, Self-Care, Getting Along with other, Life Activities (both household and work/school activities) and Participation in Society (27, 28). In the current study, the reliability of WHODAS2.0 was assessed and the results showed the reliability test-retest was 0.98 and Chronbach Alpha calculated 0.95. The construct validity of the instrument showed good correlation between WHODAS2.0 and MSQoL-54 ( $r=0.72$ ).

### Statistical Analysis

Descriptive statistics (mean, mode and standard deviation) were used in order to analyses the demographic characteristics of participants. Data distribution test was normal and Pearson correlation coefficient was used to detect the association between disability and QoL in MS patients. To inferential statistics, Stepwise method in linear regression was used to designate to what extent the disability score can predict the QoL of MS patients. SPSS 16<sub>v</sub> was performed to analysis the data.

## 3. RESULTS

All patients completed the questionnaires and the respondent rate was 100 percent. Respondents mean age was  $33.3 \pm 10.2$ . 81% of participants were female. 61 of respondents were married and more than half of them had

academic educations. Moreover, most of participants (80%) were employed. There was no significant relationship between Socio-demographic characteristics and QoL in MS patients. Table 1 is showing the socio-demographic features of participants.

Variable	Classification	n	%
Gender	Male	19	19
	Female	81	81
Age	20-30	43	47
	31-40	29	32
	41-50	12	13.3
	>50	16	16.7
Education	Upper Diploma	15	14.85
	B.S.c	36	35.64
	M.S.c	3	2.98
	PhD	2	1.98
Marital Status	Non academic	45	44.55
	Married	61	60.4
	Unmarried	40	39.6
Occupation	Employee	75	74
	Unemployed	26	26
Total		101	100

Table 1. Demographic characteristics of patients

The disability had a large and negative association with QoL and it showed larger effect size than its subscales. The participation subscale had the largest effect size with QoL, among disability subscales. Also, the impairment severity (which measured by EDSS) wasn't significantly associated with QoL. Table 2 shows the association between disability subscales and MS patient's QoL.

Disability	Statistical indicator	Quality of Life		
		Physical	Mental	Total
Cognition	Pearson coefficient	-0.55**	-0.52**	-0.57**
	p-value	0.000	0.000	0.000
Mobility	Pearson coefficient	-0.57**	-0.44**	-0.53**
	p-value	0.000	0.000	0.000
Self-care	Pearson coefficient	-0.38**	-0.40**	-0.38**
	p-value	0.002	0.000	0.002
Interpersonal interactions	Pearson coefficient	-0.50**	-0.49**	-0.52**
	p-value	0.000	0.000	0.000
Life activities	Pearson coefficient	-0.45**	-0.41**	-0.45**
	p-value	0.002	0.001	0.001
Participation	Pearson coefficient	-0.71**	-0.64**	-0.70**
	p-value	0.000	0.000	0.000
Total	Pearson coefficient	-0.69**	-0.65**	-0.71**
	p-value	0.000	0.000	0.000
EDSS	Pearson coefficient	-0.23	-0.16	-.023
	p-value	0.07	0.06	0.06

Table 2. Association between disability and QoL. \*\* $p < 0.01$

Simple regression results are presented in tables 3 and 4; they are indicating that disability severity can affect QoL, and the social participation and cognition subscales recognized as QoL predictors.

Model	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	Std. Error of the Estimate
1	.768 <sup>a</sup>	.590	.571	11.70443

a. Predictors: (Constant), Participation and Cognition

Table 3. Correlation coefficient between QoL and Disability

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	85.803	3.488		24.601	.000
1 Participation	-.566	.117	-.575	-4.826	.000
Cognition	-.249	.107	-.277	-2.321	.025

Dependent Variable: QoL

Table 4. Unstandardized and Standardized Coefficients in order to estimate the QoL

#### 4. DISCUSSION

In this research, a large, significant and negative association was found between disability and QoL. A study on aging carried out by Tazaki et al in Japan showed that the disability can negatively affect the QoL (29). Zheng research on people with physical disabilities in China showed a moderate to large and negative association among QoL and disability (19); and these studies were in consistent with current research. The “mobility” and “getting along with others” dimensions showed a moderate to large association with QoL. Chiu et al research on people with intellectual disabilities indicated that QoL had moderate, significant and negative association with mobility subscale of disability; and they explained that increasing disability severity of mobility can reduce the patient’s QoL (30). Kuo et al conducted a research on people with a variety of disabilities and the findings showed the patients with brain injuries had experienced more difficulties in interpersonal relationships than others patients (31).

In this study, moderate association was observed between self-care subscale and QoL; this indicates that facing difficulties in self-care activities can affect the MS patients’ QoL. A research was conducted by Thomas et al on lymphatic filariasis patients and found out that limitation in activities of daily living can decline the patients’ QoL (32).

Life activities subscale had negative, moderate and meaningful association with QoL and not surprisingly, the patients’ who had no work or school actions showed lower QoL than employed ones. This finding was consistent with WHO report that suggested the social function of people who worked would be more likely better than who were unemployed (33). The study results showed a large, negative and meaningful association between “social participation” and “cognition” subscales with QoL. This implied that experienced participation restrictions and cognitive limitations by MS patients in community can severely decrease their QoL. By the way, a research conducted by Gutierrez showed that participating in social activities can increase the Paraplegia patient’s QoL (20). Based on findings of this study which was consistent with Hudson et al study (34), more disability severity leads to less QoL, in summary.

Interestingly, the physical component of QoL showed a larger negative association with the disability in moving and mobility than the mental component. This indicated that limitation in mobility will influence QoL in MS patient’s more than mental disorders. Conversely, a research

by Grain et al showed that limitation in activities of daily living can decrease the emotional and mental health more than physical function (35). Also, Connell et al described that having independency in self-care activities can improve QoL in heart failure patients (36). Surprisingly, in current study the impairment severity, which measured by EDSS, showed no significant association with QoL in MS patients. It seems that it might be happened because the EDSS developed just to measure physical impairments of CNS and in this study EDSS inventory showed a low level of physical impairments. However, in many studies they have cited that measuring activity limitations and participation restrictions can be more useful and efficient for identifying determinant factors of QoL in people with disabilities (8, 10). Similarly, Pfaffenberger illustrated that increasing impairment intensity and mobility limitation were directly associated with decreasing MS patients’ QoL (37).

The simple regression findings indicated that “cognition” and “social participation” subscales were main determinants in suggested model and mentioned subscales can predicate about 60 percent of MS patients’ QoL variance. This result was consisted with a Guirela et al research in which showed that the bipolar patients’ QoL was severely affected by participation restriction and limitation in communication with others (38). A review study by Raymond showed that cognitive problems are the most important consequence of brain impairments and patients’ QoL can be influenced by these problems (38). Consistent with Tazaki’s findings, the current study showed that attention and concentration limitations were associated with patients’ QoL (29). However, Results of a study on Paraplegia patients showed that despite existing severe disability, the patients could engage in community. Furthermore, the mentioned study demonstrated moderate and negative association between Paraplegia patients’ pain severity and QoL (36). Akinola et al research showed that the children’s QoL status can be affected by the participation and environmental factors (39). Additionally, a research in UK about dementia showed that the patients’ QoL might be affected by caregiver and family attitude (40).

Given the large and significant association between the cognitive subscale and the quality of life of patients, it seems using specialized treatments such as psychotherapy and cognitive therapy can reduce the degree of cognitive disability (41, 42). Given that there was a large association between the mobility and quality of life, it would be helpful to use the mobility rehabilitation therapies such as muscles physiotherapy and motions improvement, also enhancement gross motor status and increase the ambulation of patients, which ultimately increases quality of life in MS patients.

Fatigue and depression are the most common illness consequences among MS patients. The best solution for fatigue would be prioritizing tasks in order of importance. Furthermore, the patients should do some jobs that make them less tired. In case of depression, psychological counseling could be used. Modifying environmental factors which influence these patients, changing society’s attitude toward people with disabilities, reforming laws and policies and finally increasing and improving the patient’s employment opportunities and financial situation might increase the

participation of MS patients in the community.

MS patients' limited population was the first limitation of the study. The second one was that the effect of environmental factors on disability level which was not assessed.

## 5. CONCLUSION

The cognition and participation, disability subscales, were the most important predictors for QoL. Counseling psychological and psychotherapy, increasing employment opportunities and changing society's attitude to people with disability would be suggested to decrease the cognitive disability and participation restriction.

- **Acknowledgments:** This study was a part of MSc thesis of Mr Kamal Shakhi and supported by the Research Affairs Deputy, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran.
- **Conflict of interest:** None declared.

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