Health-Related Quality of Life of Patients with Multiple Sclerosis in Oman – A Cross-Sectional Study

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Abstract

Objectives: Multiple sclerosis is a disabling neurological disorder with significant negative effects on patients' quality of life. Despite the increased prevalence of multiple sclerosis in Arabian Gulf countries in recent years, no study has assessed the impact of multiple sclerosis on the health-related quality of life of Omani patients. Therefore, the objectives of the current study was to assess the impact of multiple sclerosis on the health-related quality of life of Omani patients using the validated disease-specific self-administered MusiQoL instrument.

Methods: A cross-sectional descriptive study was carried out between April and December 2019 on 177 Omani patients with multiple sclerosis attending two major hospitals in Oman. Patients' health-related quality of life was assessed using the validated disease-specific self-administered MusiQoL instrument.

Results: Majority (51.4%) of the patients had poor HRQOL and 48.6% had moderate HRQOL. We found that being older than 30 years, a female, married, separated, widowed, or divorced, and having visual and sleep problems had poorer health-related quality of life. Among the different health-related quality of life components, relationship with the healthcare system and relationship with family and friends were the most affected because of the disease process. Our results also showed that psychological well-being and coping domains of MusiQoL questionnaires are significantly reduced in females as compared to males.

Conclusion: Understanding the health-related quality of life of Omanis with multiple sclerosis provides valuable knowledge that could help optimize the management of this disease.

Keywords: Quality of life; multiple sclerosis; Oman; questionnaire.

Introduction

Approximately three million people worldwide are affected by MS, with Caucasians having a higher incidence than Sub-Saharan Africans.[1] The estimated crude prevalence of MS in Oman rose to 15.9/100,000 by 2019, suggesting that Oman should be placed in the medium-risk zone for MS.[2] Multiple Sclerosis (MS) is a chronic, inflammatory and disabling disorder that causes demyelination in the nervous systems of young and middle-aged adults.[3] This inflammatory disease is characterized by phases of exacerbation in which the symptoms are heightened, and phases of symptom subsidence, where the symptoms are minimal.[4] These symptoms may include sensation changes, vision problems, dysarthria, muscle weakness, imbalance, mood changes, depression, pain, fatigue, and heat intolerance.[5] In addition to these symptoms, MS can influence many characteristics of a patient's personal life and has considerable repercussions on their quality of life (QoL).[6] Patients with MS need long-term treatment. One of the major goals in treating MS is to decrease the negative effects of this chronic disease on patients' QoL.[7] Health-related quality of life (HRQoL) is a complicated concept in which a patient's health is evaluated through physical, emotional, mental, and social components.[8] An assessment of HRQoL is necessary to enable a better and holistic course of treatment aimed at improving the overall quality of health of the patient.[5]

Since objective indicators do not accurately reflect the effect of MS on a patient's personal life; many instruments to effectively measure QoL from the perspective of the patient have been developed.[8] Many HRQoL surveys for MS are available and have been extensively used. However, the majority of these surveys are generic instruments and not specific to MS [5]. In 1992, the MS International Quality of Life (MusiQoL) questionnaire was developed and validated in 15 countries.[9] This instrument is short, self-administered, and multidimensional, and it specifically

studies patients' points of view regarding the effect of MS on their QoL.[10,11] The MusiQoL has

been translated into many languages, including Arabic, and has been psychometrically assessed

and validated based on a standardized methodology. Previous studies from around the world have

used MusiQoL to assess patients' points of view on the impact of MS on their daily lives.[12-15]

However, to the best of our knowledge, no studies have focused on the effect of MS on HRQoL

in Omani patients. Each country has unique factors, practices, beliefs, traditions, and healthcare

systems, which could lead to differences in patients' QoL.[16] Therefore, there is a need for research

into the HRQoL of Omani patients with MS because presently, there is no researched information

about the subject in this Middle Eastern country.

According to the Atlas of MS 2013 map, Oman, which is part of the Arabian Gulf, is a low-

risk region for MS.[17] The prevalence of MS in this zone started to increase during the first decade

of this century, except in Oman, which reported a low prevalence rate of 4/100,000 in 2005.[18] One

could therefore hypothesize that Omanis may have different genetic factors than their Arab

neighbors.[19] Thus, this study aims to assess the impact of MS on the HRQoL of Omani patients

using the validated disease-specific self-administered MusiQoL instrument.

Methods

Study design, Setting, Participants

This cross-sectional descriptive study was carried out between April and December 2019 on

177 MS patients who attended the neurology out-patient departments of two major hospitals in

Muscat, Oman. The study was approved by the Research and Ethics Committees of the College of

Nursing, Sultan Qaboos University Hospital, and the Ministry of Health (REC/2017-2018/09).

Participants in the study were patients who had been diagnosed with MS by the senior neurologist of

these two tertiary care hospitals in Muscat based on the McDonald criteria. Both male and female MS patients above the age of 18 years who were willing to participate were included in the study. Patients perceived to have physical or mental challenges in answering the questions were excluded from the study. According to a recent hospital based study, 15.9 % is the prevalence rate of MS in Oman. All of the patients are treated in the tertiary care hospitals in Muscat like SQUH, and KHOULA hospitals. Sample size is calculated with the help of the following formula: $N = Z^2 P (1-P) / d^2$ where n is the number of samples, Z is the level of confidence (95% = 1.96), P is prevalence (15.9 %); d is effect size (5 %).

N = $(1.96)^2$ x 0.159 (1 -0.159) / 0.05^2 = 205, was the final sample size. We collected the patient list from the hospital registry and consecutive sampling method was used to approach the patients during this period of data collection. The response rate was 86 percent.

Study Instruments

The research instrument, is a self-reported questionnaire in Arabic consists of three sections: section one has questions related to socio-demographic variables (age, gender, occupation, place of living, education level, marital status, and occupation); section 2 has clinical profile (disease course – relapsing-remitting, primary progressive, or secondary progressive); disease duration; type of MS-specific therapies; visual functions, and sleep patterns and section three is the MusiQoL part to assess the HRQOL. The MusiQoL questionnaire, which comprises 31 items that describe nine dimensions. Each dimension is named according to its constitutive items, as follows: activities of daily living (8 items); psychological well-being (4 items); symptoms (3 items); relationships with friends (4 items); relationships with family (3 items); relationship with the healthcare system (3 items); sentimental and sexual life (2 items); coping (2 items); and rejection (2 items) [20]. Each item was responded to using a six-point Likert scale, where 1 = 'never/not at all', 2 = 'rarely/ a little', 3 = 'sometimes/somewhat', 4

= 'often/a lot', 5 = 'always/very much', and 6 = 'not applicable'. The negatively worded item scores were reversed. All dimension scores were linearly converted to a 0-100 scale and the higher scores indicated poor HRQOL. A score of up to 20 was considered good HRQoL, a score of 20.1 to 60 was considered moderate HRQoL, and a score above 60 was considered poor HRQoL. Results from the validation of MusiQoL suggest that the instrument is a disease-specific instrument that is sensitive to changes in clinical status of patients [9,21]. The researchers also reported that the instrument demonstrated good internal validity and consistency, external validity, and reproducibility with a Cronbach's alpha of 0.92.

Data collection

Data was collected by Research Assistants who are senior Registered Neurology nurses who were specifically trained to collect data from MS patients. Information about patients diagnosed with MS was collected from the hospital registry. Three subtypes of MS were identified from the patient file and were defined as: 'relapsing-remitting', 'secondary progressive', and 'primary progressive'. The selected participants were then approached in the Neurology Outpatient departments of the two hospitals when they came for their routine follow-up visits. After thorough explanation of the study purpose and assurance of anonymity, as well as their confidentiality and right to withdraw at any time from the study, written informed consent was obtained from every subject involved in the study, in their language (Arabic). The subjects were then interviewed in a private room by the research assistant. Participants were given the self-reported questionnaire and those who required assistance were helped by the research assistant. All personal identifications of patients remained anonymous to ensure that there was no violation of privacy. (Arabic and English). Data confidentiality was maintained as well and all physical data files were kept in locked cabinets in the researcher's office. All the signed informed consent forms with the respondent's details were stored and locked separately

from the data. Confidentiality was also maintained by assigning code numbers instead of names to the data files.

Data Analysis

Statistical Packages for Social Sciences version 23 was used for data entry, data cleaning, and data analysis. The data was audited for accuracy by two investigators. Normality of data was checked with shapiro-wilkinson's test before proceeding with data analysis. A probability of $<.05$ was considered statistically significant for all tests. Descriptive summaries of socio-demographic and clinical characteristics (means, standard deviations, frequencies, percentages) were used to describe the sample. Comparison of HRQoL scores with demographic and clinical variables was done with an independent t-test and ANOVA analysis.

Results

A total of 177 Omani patients diagnosed with MS, with a mean age of 34.71 ± 8.69 years, participated in the study. Descriptive statistics showed that 73.4% of the patients were female. Almost half of the participants (53.7 %) lived in Muscat, the Capital City of Oman, and 53.7% of them had a university education. In addition, 61.6% were married and 54.8% were employed as well. In terms of disease subtype, majority of the patients (92.1%) were classified as having relapsing-remitting MS, while 2.8% as having primary progressive MS, and 5.1% as having secondary progressive MS. In regard to symptoms, approximately 41.8% of the respondents complained of visual impairments, while 33.3% of them experienced sleep disturbances. Table 1 presents the demographic profile of the respondents.

Table 1. Demographic and clinical profile of participants (N=177)

Demographic and clinical profile of the participants	N (%)
Age	

Up to 30 years	57 (32.2)
31-50	108 (61.0)
Above 50 years	12 (6.8)
Gender	
Male	47 (26.6)
Female	130 (73.4)
Place of living	
Muscat (capital)	95 (53.7)
Outside the capital	82 (46.3)
Educational level	
Up to elementary school	17 (9.6)
High school and higher secondary	65 (36.7)
University education	95 (53.7)
Marital status	
Single	56 (31.6)
Married	109 (61.6)
Separated/Divorced/Widowed	12 (6.8)
Occupation	
Employed	97 (54.8)
Unemployed	80 (45.2)
Disease course	
Relapsing-remitting	163 (92.1)
Primary progressive	5 (2.8)
Secondary progressive	9 (5.1)
Type of MS specific therapies	
Disease modifying medicines	150 (84.7)
Disease modifying medicines and physiotherapy	27 (15.3)
Visual functions	
Normal	103 (58.2)
Visual impairments	74 (41.8)
Sleep patterns	
Normal	118 (66.7)
Sleep disturbances	59 (33.3)

The mean duration of the disease was 6.6±4.57 years at the time of the study. A slight majority of the respondents (51.4%) had poor HRQoL (Scores between 60.1 – 100), while 48.6% of them had moderate HRQoL (scores between 20.1 – 60). Surprisingly, no patient had a good HRQoL (0-20 scores).

A mean score up to 20 is considered as good HRQOL perception; score from 20.1 to 60 as moderate HRQOL and scores above 60 is poor HRQOL perception with the disease. The total mean

score of the HRQoL of the respondents was 60.55±11.38 and is presented in Table 2 along with the component scores. Regarding the subscales, the relationship with the healthcare system and relationship with family are the most affected components, with mean scores of 81.66±18.90 and 75.74±24.17, respectively. The least affected subscale is rejection, with a mean score of 42.15±25.25.

Table 2. Mean and standard deviation of total and component scores of health-related quality of life of MS patients

Components of HRQoL	Mean (SD)
Activities of daily living	57.42 (22.15)
Psychological well-being	60.34 (22.78)
Symptoms	56.61 (20.30)
Relationship with friends	63.09 (15.03)
Relationship with family	75.74 (24.17)
Sentimental and sexual life	52.26 (39.59)
Coping	49.83 (25.79)
Rejection	42.15 (25.25)
Relationship with the healthcare system	81.66 (18.90)
Total HRQoL	60.55 (11.38)

HRQoL health-related quality of life; *MS* multiple sclerosis; *SD* standard deviation

Table 3 illustrates the comparison of means of HRQoL and gender. Females reported a poor HRQoL in total and the components of HRQOL. Statistically significant differences were seen with psychological well-being (t=-2.353, df=175, p=.02), coping (t=2.630, df=175, p=.009), and total HRQoL (t=2.145, df=175, p=.033), with males having better HRQoL. The relationship between HRQoL components and other demographic variables did not show any statistically significant differences (data not shown).

Table 3. Comparison of HRQoL scores of MS patients based on gender

Total and component scale HRQoL	N	Mean	SD	t-test	P value
Activities of daily living					
Male	47	55.59	23.179	-0.66	0.51
Female	130	58.08	21.825		
Psychological well-being					
Male	47	53.72	22.226	-2.353	0.02
Female	130	62.73	22.586		
Symptoms					
Male	47	53.4	17.91	-1.266	0.207
Female	130	57.77	21.039		
Relationship with friends					
Male	47	61.13	14.333	-1.04	0.3
Female	130	63.79	15.26		
Relationship with family					
Male	47	73.19	25.688	-0.844	0.4
Female	130	76.67	23.629		
Sentimental and sexual life					
Male	47	53.19	40.759	0.188	0.851
Female	130	51.92	39.318		
Coping					
Male	47	41.49	22.456	*-2.63*	0.009
Female	130	52.85	26.332		
Rejection					
Male	47	42.55	26.166	0.128	0.898
Female	130	42	25.009		
Relationship with the healthcare system					
Male	47	77.59	22.647	-1.731	0.085
Female	130	83.13	17.217		
Total HRQoL					
Male	47	57.53	11.766	*-2.145*	0.033
Female	130	61.64	11.083		

HRQoL health-related quality of life; *MS* multiple sclerosis; *SD* standard deviation

The results of the ANOVA analysis of the demographic and clinical variables with the total mean scores of HRQoL of MS patients are presented in Table 4. Only significant results are presented in the table. The results suggest a significant difference between total HRQoL scores and age groups (F (2, 174)=5.107, p=.007), marital status (F(3,173)=4.155, P=.007), sleep pattern (F(1,175)=12.620, p<.001), and visual functions (F(1,175)=6.236, p=.013). Post hoc analysis revealed age group above 31 years old, being separated, divorced, or widowed, group perceived poor HRQOL than others. Being a female, and having sleep and visual disturbances are associated with poor HRQoL scores.

Table 4. Association of total HRQoL of MS patients with their demographic and clinical characteristics

Demographic and clinical profile	N	Mean	SD	df	F	P value
Age						
Up to 30 years	57	56.68	11.066			
31-50	108	62.47	10.766	2,174	5.107	.007
Above 50 years	12	61.67	14.383			
Marital status						
Single	56	56.72	10.743			
Married	109	61.78	11.027	3, 173	4.155	.007
Separated/Divorced/Widowed	12	66.92	11.989			
Visual functions						
Normal	103	58.77	11.466	1,175	6.236	.013
Visual impairments	74	63.03	10.856			
Sleep patterns						
Normal	118	58.47	11.283	1,175	12.620	.000
Sleep disturbances	59	64.71	10.479			

HRQoL health-related quality of life; *MS* multiple sclerosis; *SD* standard deviation

Discussion

The MusiQoL questionnaire was used to assess the respondents' MS-specific HRQoL. To our best knowledge, this study is the first to investigate the HRQoL of Omani patients with MS using this valid and reliable questionnaire. In analyzing the data of 177 Omani patients with MS,

we found that being older than 30 years, female, married, separated, widowed, or divorced, and having visual and sleep problems were significantly associated with poorer HRQoL. Among the different HRQoL components, relationship with the healthcare system and relationship with family and friends were the most affected as a result of the disease process. Our results also showed that psychological well-being and coping domains of MusiQoL questionnaires are significantly reduced in females as compared to males.

The MusiQoL instrument is the best to use in our setting because it has been validated in 14 languages, including Arabic, and the differential item functioning was found to be satisfactory in more than 15 countries around the world.[9] The use of this questionnaire is suitable for international settings and such use can actually be beneficial for comparison between different populations. The MusiQoL instrument has the advantage of being shorter than other instruments and more suitable for clinical practice.[13] It is well known that HRQoL is affected by the population's different cultural backgrounds and healthcare systems. Our study is the first to assess HRQoL in Omani patients with MS.

In the present study, all patients had a high MusiQoL score that fell in the moderate to low HRQoL category. This result can be explained by the fact that over 90% of the studied population suffers from relapse-remitting MS subtype. In fact studies have shown that the worst level of HRQoL is observed in patients with relapse-remitting MS.[12] Similarly, other studies have revealed that the more progressive the disease course, the poorer the HRQoL for the MS patient.[22] However, in our study, the low percentage of patients with progressive disease (less than 8%) did not allow us to compare the HRQoL between the three different disease courses.

The study found that patients with MS showed a low level of HRQoL in the components of the relationship with the healthcare system with family and friends. This therefore implies that having

MS affects interpersonal relationships with family and friends. Studies have shown that social support is a very important component that can help to improve HRQoL in MS patients. Interestingly, while all support is important, psychological support to the MS patient appears to be more required than material support in all dimensions of HRQoL.[23] Hence understanding which components greatly affect patients with MS will allow us to develop strategies to mitigate their effect and positively affect such patients' HRQoL.

Comparison of means among the categories of sociodemographic characteristics showed that older adults, females, those who are separated, divorced, or widowed, and patients with visual and sleep problems have poorer HRQoL. This result supports the findings of many other studies that also showed that younger age (less than 30 years) and being a male were significantly linked to a better HRQoL in similar studies conducted using MusiQoL instrument.[13,24,25]

We also found that the patient's marital status also played a significant role in affecting their total HRQoL. Being single was associated with higher HRQoL levels. Being married was associated with a lower HRQoL, while being divorced, separated, or widowed had the lowest scores. This result appears to contradict findings of previous studies, which showed that being married was associated with higher HRQoL levels.[10,26] For instance, in a study of 1992 patients from 15 countries, Fernández et al. found that patients with MS who have partners had significantly higher HRQoL than did single patients.[13] In trying to better understand the possible explanation for this difference, we noted that all these previous studies asked respondents whether they were "single" or "not single". It is possible that a separated, divorced, or widowed person would answer as single; therefore, the differentiation between single (never been married) and separated, widowed, or divorced may not have been as clear to their respondents. This could have influenced the results and increased the score for the "single" component. In our study, we can argue that a

single patient who was never been married has the highest HRQoL. A married patient probably has more responsibilities and, therefore, has a lower HRQoL, while a separated, divorced, or widowed patient lacks the family support that they once had and this easily shows as having the lowest HRQoL. Omani patients with MS showed a low level of the HRQoL dimension of relationship with family, which could also explain the aforementioned association.

The present study showed poor HRQOL perception among MS patients with sleep and vision disturbances. This finding is supported by other researchers.[27,28] Increased levels of inflammatory cytokines or lesions in the brain may disrupt pathways involved with sleep which may contribute to sleep disruption in MS patients.[29] Visual disturbances in MS patients need to be considered in the light of falls which is commonly reported among them.[30] These findings highlight the importance of carefully screening all patients with MS for the presence of sleep and visual problems so that a variety of strategies to reduce the effects of these problems on the HRQoL are implemented promptly. Future research on sleep quality in MS should consider exploring sleep disturbance in more detail, particularly its relationship with disease activity. Vision rehabilitation may be required for patients who are experiencing visual difficulties in the course of the disease progression. It is important to use a holistic, interdisciplinary approach to address the person's needs with MS.

In the present study, educational level, employment status, disease course, and MS-specific therapy did not show any difference in perception of HRQoL. Unlike other study populations,[10] Omani MS patients who have a higher level of education do not have a better HRQoL. This could be because only slightly less than 10% of the studied sample did not have a high school or university education. Contrary to other studies,[31] our results do not show a higher HRQoL among employed MS patients when compared to the unemployed patients. This observation could be

unique to the Omani population and may be associated with the society and particular characteristics of Omani MS patients.

When examining demographic variables, we found that only gender exhibits differences in some MusiQoL dimensions. Other sociodemographic variables did not affect the different component scales of the MusiQoL questionnaire. We found that the HRQoL of males is somewhat higher than that of females but only for two MusiQoL domains. Both psychological well-being and coping scores were higher for women compared to men, which means better functions for the latter. As a mediator between MS and psychological well-being, coping is an important domain to be assessed. As MS advances, coping becomes of paramount importance to the patient's psychological well-being.[25] Studies have shown that emotional and psychological functions are lower in women with MS than in men.[13,31] The finding that coping and psychological wellbeing appear to negatively impact females more than males must be further explored to understand the reasons for these differences among the genders. One possible reason in our setting is that Oman is a patriarchal society whose culture places a high expectation on men, who should show physical and mental ability, power, efficiency and productivity. These findings are very important in developing coping strategies that specifically target Omani men and women with MS who could benefit from a rehabilitation psychological program. Studies suggest that patients should change their lifestyles, ambitions, and expectations from their physical performances and adapt themselves to live with the disability to better cope with MS.[32]

Eye examinations in the early stages to prevent diminishing visual acuity, sleep clinics to empower them with strategies to overcome their sleep disturbances and psychological counseling with family support can play an important role in improving the HRQOL of these patients living with MS.

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Several limitations of our study should be examined. First, the size of the studied population is relatively small (n = 177) and additional research with a larger sample of Omani patients is necessary to confirm our results. Second, our study did not assess fatigue, depression, anxiety and other major symptoms like pain, bladder/bowel symptoms and disability; however, those parameters have been shown to affect HRQoL.[6,33] It is recommend that, future research on the observation of all the major symptoms experienced by these patients could be assessed. Another limitation is the cross-sectional study design, which does not allow us to interpret the associations as causal relationships. Only a longitudinal study can allow us to better understand the course of MS and their coping mechanisms in Omani patients.

Discovering the HRQoL of MS patients will help the health care providers to assess their patients and treat them in a better way. This research will help patients with MS who have not been coping well with their disease to be better identified, treated, and referred to counsellors when deemed necessary. The results of this study will contribute to the limited body of literature on Omani patients with MS and allow us to develop strategies for improving their HRQoL. Such information will aid stakeholders including the Ministry of Health of Oman to plan strategies to improve their HRQoL to ease the burgeoning load of this disease to the Omani society.

Conclusion

Poor HRQOL has been reported by the Omani patients with MS in our study. Among them, Older age, female gender, marital status, and patients with visual and sleep problems have reported poor HRQoL. Moreover, relationship with the health care system and relationship with family and friends most negatively affect such patient's HRQoL. Understanding these results is of paramount importance to the Omani health care system in order to design a more comprehensive approach to

more effectively care for Omani patients with MS. Understanding factors influencing HRQoL among people with MS is helpful for the health care workers to design early intervention programs.

Acknowledgments

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