

Symptom severity, social supports, coping styles, and quality of life among individuals' diagnosed with Ménière's disease

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Abstract

Objectives: To (1) examine the quality of life of individuals with Ménière's disease in relation to symptom severity, social supports, and coping styles and (2) develop a prediction model to identify factors most strongly associated with quality of life.

Methods: Data were collected using a web-based survey that included previously developed and validated measures (i.e. SF-12, Dizziness Handicap Inventory, Hearing Handicap Inventory for Elderly Screening Version, Iowa Tinnitus Handicap Questionnaire, Interpersonal Support Evaluation List, Brief COPEs, Lehman's Quality of Life). Ninety-five individuals with Ménière's disease who were members of one of five online Ménière's disease support groups responded to the survey.

Results: The findings indicated that symptom severity was negatively associated with patients' quality of life, social supports were positively associated with quality of life, and the use of negative coping styles (e.g. substance use, blaming) was negatively associated with quality of life. Four predictors (i.e. SF-12 mental health, dizziness severity, self-esteem support, and negative coping styles) accounted for 62% of the variance in quality of life.

Discussion: The findings suggest that the factors associated with the quality of life of patients with Ménière's disease are similar to those reported in the literature among patients with other chronic illnesses. The results also suggested that emphasis on psychosocial factors may be an important aspect of a comprehensive treatment intervention for individuals with Ménière's disease.

Keywords

Ménière's disease, quality of life, social supports, coping styles, symptoms

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Introduction

Ménière's disease (MD) is a chronic progressive inner ear disorder categorized by episodic vertigo, fluctuating sensorineural hearing loss, tinnitus, and aural pressure.¹ Vertigo is a sense of dizziness that can range from lightheadedness to severe spinning resulting in a disoriented state and loss of balance. Nausea, vomiting, profuse perspiration, and headaches can accompany and/or follow the vertigo.² Tinnitus is the sensation of hearing a sound in the ear such as ringing, buzzing, whistling, or other sounds. The sensation can be intermittent or continuous and vary dramatically in loudness. Aural pressure is a feeling of a sense of fullness or pressure in the ear. This symptom can also fluctuate and cause considerable discomfort and distress for some patients. In the early stages of MD, not all symptoms are typically present which can make MD difficult to diagnose.³

A study conducted in Rochester, MN estimated the prevalence rate of MD during 1980 to be 218 per 100,000 and the age-adjusted incidence rate to be 15 per 100,000.² Harris and Alexander⁴ reported the number of new cases of MD in the United States during the period 2005–2007 to be 242,500. Lee reported the average age of onset for MD is in the fifth decade of life for both men and women.⁵ However, individuals as young as 15 years of age have been reported with MD.² The majority of patients with MD are affected unilaterally; only 10% have it bilaterally.^{3,6}

Thus far, neither a cause nor a cure has been identified for MD. However, it has been reported that the quality of life (QoL) of patients with MD has been enhanced by instituting various lifestyle changes such as reducing sodium intake or treating allergies³ and through more invasive interventions such as endolymphatic sac decompression or gentamicin injections.⁷

Previous studies on other chronic diseases have documented that individuals' symptom

severity,^{8,9} social supports,^{10–12} and coping styles^{8,13,14} are significantly associated with their QoL. Several studies have focused on the QoL among individuals diagnosed with MD. Anderson and Harris¹⁵ found a loss in QoL among 19 adult patients with MD compared to individuals who had no symptoms. Soderman et al.¹⁶ surveyed 112 individuals diagnosed with MD and found that a majority of the patients rated their QoL as "very good" or "good." In another study, Soderman et al.¹⁷ reported that adults diagnosed with MD rated their QoL significantly poorer compared to healthy adults. In addition, they also found that the severity of respondents' vertigo, tinnitus, and hearing loss were significant predictors of their QoL. Yardley et al.¹⁸ surveyed 509 members of a UK self-help group and found that poorer QoL was associated with symptom severity, being younger, being female, living alone, having a lower occupational status, and believing that the attitude of the consultant is unhelpful. Finally, Hagnebo et al.¹⁹ found that the coping styles of patients with MD were significantly associated with their level of anxiety and perceived functional handicaps.

These studies conducted on QoL suggest that there is much to be learned about the relationship of social supports and coping styles with the QoL among individuals with MD. The purpose of this study was to (1) determine the extent to which symptom severity, social supports, and coping styles were associated with the QoL of individuals with MD, and (2) expand on previous research^{15–17} and develop a prediction model to identify factors that were most strongly associated with respondent QoL.

Methodology

Participants

The sample included English-speaking adults 18 years and older who were diagnosed with MD. Participants were members

of one of five online support groups developed specifically for individuals with MD. The support groups that were surveyed included: (1) I Am Affected by Ménière's Disease, (2) Daily Strength: Ménière's Disease Support Group, (3) Spin Cycle Ménière's Disease Chat and Support Group, (4) I Suffer From Vertigo/Ménière's Disease, and (5) Ménière's Disease Group—You're Not Alone. These support groups were selected because the websites displayed recent activity and reported a significant number of members.

Measures

Seven previously developed and validated measures were incorporated into an online Qualtrics® survey. These measures targeted five domains: (1) respondent demographics, (2) symptom severity, (3) social supports, (4) coping styles, and (5) QoL. Overall the survey contained 152 questions and took about 30 min to complete.

Demographics. The demographic section of the survey contained six questions: (1) gender, (2) age, (3) race/ethnicity, (4) marital status, (5) employment status, and (6) income. This section also included four questions specific to respondents' MD that included: (1) age of onset, (2) number of years since initial diagnosis, (3) unilateral or bilateral, and (4) history of invasive procedures, if any.

Short Form-12 (SF-12). The SF-12²⁰ is a 12-question measure assessing perceived physical and mental health status of respondents. This measure has been found to have good test-retest reliability.^{20,21} Support for the validity of the SF-12 has been established through its ability to distinguish between individuals diagnosed with severe mental illnesses and individuals in a general population as well as through the relationship of its scores to other physical and mental health indices in predicted ways.²²

Dizziness Handicap Inventory (DHI). The DHI²³ is a 25-item self-report measure designed to assess patient perception of the handicapping effects associated with vestibular system disease. The items are categorized into three content domains representing the (1) functional, (2) emotional, and (3) physical effects associated with dizziness and unsteadiness. The measure has been found to have good internal consistency²³ and test-retest reliability.^{23,24} The validity of the DHI was supported by the fact that patients' DHI scores were significantly associated with their scores on the Dynamic Gait Index.²⁵ The Cronbach's alpha on this measure for respondents in the current study was .93.

The Hearing Handicap Inventory for Elderly Screening Version (HHIE-S). The HHIE-S²⁶ is a 10-item measure assessing respondents' perceived social and emotional effects of hearing loss. Demers²⁷ reported the HHIE-S has good internal consistency and test-retest reliability. Support for the measure's validity was established by comparing respondents' answers to audiogram-defined hearing loss producing acceptable sensitivity and specificity.^{28,29} In this study the internal consistency estimate using Cronbach's alpha was .93.

The Iowa Tinnitus Handicap Questionnaire (ITHQ). The ITHQ³⁰ is a 27-item self-report measure designed to assess the impact of tinnitus on patients' lives. The measure evaluates the impact of tinnitus in three domains: (1) emotional, social, and health; (2) hearing; and (3) perception of tinnitus.³¹ The measure has been found to have high total score internal consistency³⁰ and good construct validity.³² In our study, the internal consistency reliability estimate using Cronbach's alpha was .94.

The Interpersonal Support Evaluation List (ISEL). The ISEL is a 40-item self-report measure of functional social supports³³ that assesses four components of social

supports: (1) appraisal, (2) self-esteem, (3) belonging, and (4) instrumental support. Appraisal refers to supports provided to individuals through the information, advice, and suggestions of others. Self-esteem relates to the encouragement and confidence individuals gain through the support of others. Belonging focuses on the emotional comfort and support that individuals receive as a result of companionship and relationships with others. Finally, instrumental or a tangible social support is based on financial assistance and services that others provide the individual. The ISEL has been reported to have good internal consistency and test-retest reliability.^{34,35} The validity of the measure has also been demonstrated.^{36,37} The Cronbach's alphas in this study were .89 for appraisal, .90 for tangible supports, .85 for self-esteem, and .91 for belonging.

Brief COPEs. The Brief COPE³⁸ is a 28-item self-report measure of coping strategies denoting 14 dimensions. There is support for the measure's internal consistency as well as convergent and concurrent validity.³⁹ For this study, the 14 different dimensions of the Brief COPEs were categorized into two coping subcategories: the use of positive coping strategies and the use of negative coping strategies. The eight dimensions that comprised the positive coping strategies category include coping strategies such as using humor or trying to see things in a more positive light. The six dimensions that comprised the negative coping category included coping strategies such as blaming others or using substances. The Cronbach's alpha was .51 for negative coping styles composite scores and .75 for the positive coping styles.

Lehman's QoL. The eight subjective items from the Quality of Life Interview for the Chronically Mentally Ill⁴⁰ were used to assess respondents' QoL. These self-report items assess satisfaction in seven life domains that include: (1) living situation, (2) financial

condition, (3) health status, (4) relationships with people, (5) employment or educational status, (6) recreational and leisure opportunities, and (7) legal issues and safety. In addition, an assessment of overall QoL was obtained. The QoL scale has been found to produce scores with good internal consistency.⁴¹ The Cronbach's alpha for the total scale among the current study sample was .89.

Procedures

This study utilized a correlational design and a web-based survey as the method of data collection. Prior to the implementation of any aspect of this study, all methods and protocols were reviewed and approved by the University of South Florida Institutional Review Board (IRB). Once approved, the second author, who is diagnosed with MD, enrolled in the five online M nieri s support groups previously described and posted an IRB-approved script detailing the purpose and scope of the study. Members of the support groups were invited to participate in the study by completing an online survey. The link to the survey was provided in the posting. Two weeks after the initial posting, a reminder message was posted to each support group site.

Analysis

Prior to initiating data analysis, data editing was conducted. Missing data were analyzed and any out-of-range responses were recoded. The second phase of data analysis involved the computation of scale scores for the various measures included in the online survey. Descriptive statistics were calculated for each scale and reliability analyses were performed. Pearson correlations were then calculated to assess the direction and magnitude of the bivariate relationships of the five health/symptom severity measures (i.e. SF-12 mental and physical, DHI, HHIE-S, ITHQ), the four types of social supports (i.e. appraisal, self-esteem,

belonging, instrumental), and the two coping styles (i.e. positive and negative) with respondent QoL. The relationship of demographic characteristics and QoL were also examined.

Finally, a stepwise linear regression was performed to identify which factors were most highly associated with QoL. Because of the small amount of missing data that was present, mean substitutions were used in this analysis. The assumptions of normality, linearity, and homoscedasticity were examined prior to conducting the regression analysis.^{42,43} Descriptive statistics associated with the predictors were examined to assess the normality of the distribution. The results of these analyses indicated that each of the 10 predictors had skewness and kurtosis values within the acceptable range. Linearity and homoscedasticity were assessed by inspecting the bivariate scatterplots during the correlational analysis. The results of this inspection indicated that the predictor variables were both linearly related^{42,43} and homoscedastic.⁴³ Finally, tolerance statistics were examined to assess for the presence of multicollinearity among predictors given that multicollinearity presents problems in regression analysis when correlations among predictors are high.⁴³ The resulting tolerance values were within acceptable range suggesting multicollinearity was not a concern.

In addition, a power analysis was conducted prior to the multiple linear regression analysis using G*Power³⁴⁴ to ensure sufficient power with 95 respondents. With 10 predictor variables in the regression model, the analysis had 80% power to detect a multiple $R^2 = .20$ at the $p = .05$ level of significance with a sample size of 91 respondents.

Results

Survey respondents characteristics

A total of 95 respondents completed the survey. The demographic characteristics of

Table 1. Respondent characteristics.

Characteristics	N	%
Gender		
Male	13	13.7
Female	80	84.2
Missing	2	2.1
Race		
White	89	93.7
Black or African American	2	2.1
American Indian or Native American	2	2.1
Asian or Pacific Islander	1	1.1
Missing	1	1.1
Ethnicity		
Hispanic	2	2.1
Non-Hispanic	93	95.8
Missing	2	2.1
Marital status		
Married	73	76.8
Not married	22	23.2
Employment status		
Working full or part time	53	55.8
Not working	42	44.2
Age (N = 91)		
Mean	47.3	
SD	10.9	
Range	19–71	
Unilateral versus bilateral		
Unilateral	50	52.6
Bilateral	39	41.1
Missing	6	6.3
Age of onset (N = 95)		
Mean	38.6	
SD	12	
Range	11–65	
Years since diagnosis (N = 94)		
Mean	8	
SD	6.3	
Range	1–20	

the respondents are summarized in Table 1. The average age of respondents was 47.3 years old ($SD = 10.95$) and ranged from 19 to 71 years old. In terms of gender, 84.2% of the respondents were female. The majority of

respondents were white (93.7%). Only 2.1% were Hispanic. Approximately three quarters of the respondents were married (76.8%) and 55.8% were employed full or part time.

Pertaining to respondents' MD, the average age of diagnosis was 38.6 years old ($SD = 12.02$). On average, it had been eight years since the respondents were diagnosed ($SD = 6.25$). Nearly 53% of the respondents reported MD unilaterally while 41.1% were diagnosed bilaterally. The remaining 6.3% of the respondents selected "other" on the survey. Of the 95 respondents, 43.2% reported having had an invasive treatment procedure for their MD.

Respondent QoL

The majority of the respondents (55.9%) reported their satisfaction with their overall QoL as "very" (17.2%) or "moderately" (38.7%) satisfied. In addition to overall QoL, respondents rated their QoL in seven life domains on a four-point scale ranging from 1="not at all satisfied" to 4="very satisfied." Respondents reported the greatest satisfaction with their living arrangements ($M = 3.37$, $SD = .83$) and not surprisingly, their least satisfaction with their health status ($M = 2.20$, $SD = .97$). The theoretical range on the entire QoL scale could range from 8 (i.e. lowest satisfaction with QoL) to 32 (i.e. the highest level of satisfaction with QoL). The average QoL score across all domains was 21.63 ($SD = 5.94$) indicating that the QoL approached the "moderately satisfied" range for this sample of respondents with MD.

Respondent characteristics and QoL

Four demographic characteristics (i.e. gender, ethnicity, race, and age) were analyzed to determine if they were significantly associated with QoL. An independent *t*-test was conducted to determine the association of gender and ethnicity with QoL. Neither gender nor ethnicity was significantly

associated with QoL. A one-way analysis of variance conducted to assess the relationship to QoL revealed no significant association. A Pearson correlation conducted to determine if age was associated to QoL was not found to be significant. Overall, none of the respondent demographic characteristics examined were significantly associated with the QoL among this sample of respondents with MD.

Health and MD symptom severity and QoL

Pearson correlations were performed on QoL and respondents' (1) SF-12 physical health scores, (2) SF-12 mental health scores, (3) reported tinnitus, (4) reported hearing loss, and (5) reported dizziness. Respondents' SF-12 physical health status was not significantly associated with QoL ($r = .15$, $p = NS$). In contrast, respondents' SF-12 mental health scores were significantly and positively associated with QoL ($r = .58$, $p < .001$) indicating that respondents reporting better mental health status also reported enhanced QoL compared to those reporting poorer mental health. Tinnitus was significant and negatively associated with QoL ($r = -.37$, $p < .001$) meaning that respondents who reported more severe tinnitus were more likely to report poorer QoL. The severity of respondents' hearing loss was also significant and negatively associated with QoL ($r = -.29$, $p = .005$), indicating that in general the more severe respondents perceived their hearing loss, the poorer they reported their QoL. Lastly, dizziness was significantly and negatively associated with their QoL ($r = -.52$, $p < .001$) again indicating that the more problematic respondents perceived their dizziness, the poorer they reported their QoL. Overall, four of the five health and symptom severity measures (i.e. mental health, tinnitus, hearing loss, and dizziness) were significantly associated with perceived QoL. Of the five health

symptom indicators, only physical health was not significantly associated with QoL.

Coping styles, social supports, and QoL

Pearson correlations were conducted to assess the relationship between respondents' coping styles and their QoL. Respondents who reported using a greater number of positive coping styles (e.g. *active coping*—behavioral or psychological responses designed to change the nature of the stressor itself or how one thinks about it; *reframing*—viewing challenging experiences and emotions in ways to find more positive alternatives) reported significantly higher levels of QoL compared to respondents who reported using fewer positive coping styles ($r = .22, p = .03$). In contrast, respondents who reported engaging in a higher number of negative coping styles (e.g. self-blame, denial, substance use) reported significantly poorer QoL compared to those who reported using fewer negative coping styles ($r = -.50, p < .001$).

Pearson correlations were calculated on respondent scores on the four components of social support (i.e. appraisal, self-esteem, belonging, and instrumental) and their QoL. Appraisal was significantly and positively associated with QoL ($r = .49, p < .001$) meaning that respondents who have access to individuals with information that allows them to make more informed decisions reported a more positive QoL relative to respondents without access to this type of support. Self-esteem support was also found to be significantly and positively associated with QoL ($r = .70, p < .001$). Respondents with access to other people who provide them with encouragement and enhance self-worth reported higher ratings on QoL compared to respondents who received less of this type of support. Belonging was found to be significantly and positively associated with QoL ($r = .63, p < .001$). Respondents who reported greater amounts of emotional comfort and support through companionship with others

reported higher levels of satisfaction with QoL compared to respondents who reported receiving lower levels of this type of support. Finally, instrumental support was significantly and positively associated with QoL ($r = .48, p < .001$) indicating that respondents who reported access to others who could assist them with tangible tasks such as driving them places or helping them with things around the house reported an increased QoL relative to those who had less access to these types of support. In summary, all four aspects of social supports were found to be significantly and positively associated with QoL.

Predictors of QoL

A stepwise multiple linear regression was conducted to develop a model for predicting the QoL of respondents. The 10 variables that were significantly associated with QoL in the bivariate analyses were included as potential predictors of quality in the regression analysis. These variables included the four health and symptom variables (i.e. mental health, dizziness, tinnitus, and hearing loss), the four social support variables (i.e. appraisal, self-esteem, belonging, and instrumental), and the two coping strategy variables (i.e. negative and positive coping strategies). Respondent demographic variables and physical health scores were not included as potential predictors in the regression model because they did not have a significant bivariate relationship with QoL.

The stepwise regression analysis resulted in four variables being retained in the final model (see Table 2). These four variables included: (1) self-esteem social support, (2) SF-12 mental health, (3) dizziness, and (4) negative coping strategies. Self-esteem social support was the first predictor that entered into the model, accounting for 48.7% of the variance in respondents' QoL ($\beta = .487, p < .001$). The second predictor included in the model was SF-12 mental health status which resulted in a change in the adjusted R^2

Table 2. Regression analysis results—final four variable model.^{a,b}

Variables	β	SE	Beta	p	Δ Adjusted R^2
Self-esteem support	.473	.073	.479	.001	.487
SF-12 mental health	.130	.044	.237	.004	.098
Dizziness	-.044	.020	-.168	.03	.022
Negative coping strategies	-.177	.089	-.146	.05	.012

^aDependent Variable = Quality of Life (QoL).

^bOverall Model – $F(4, 90) = 39.20, p < .001$; accounted for 61.9% of the variance in the QoL.

of 9.8% ($\beta = .237, p = .004$). Dizziness, a symptom of MD, was the third predictor that entered into the model and produced a change in the overall adjusted R^2 of 2.2% ($\beta = -.168, p = .03$). Finally, the last predictor that entered into the model was negative coping strategies which resulted in an increase in the overall adjusted R^2 of 1.2% ($\beta = -.146, p = .05$). Overall, the four predictors model was statistically significant ($F(4, 90) = 39.20, p < .001$) and accounted for 61.9% of the variance in the QoL reported by these respondents diagnosed with MD.

Discussion

Three meaningful insights can be derived from the results of this study. First, individuals diagnosed with MD tend to be moderately satisfied with their QoL. This finding is consistent with previous findings.¹⁶ Second, the findings of this study are consistent with the literature on QoL reported in other studies of patients with MD as well as with patients with other chronic illnesses. Specifically, the QoL among patients with MD is associated with symptoms severity, mental health, social support, and coping styles. Third, the findings strongly support those of Hagnebo et al.¹⁹ in highlighting the importance of integrating psychosocial aspects (e.g. social supports, coping styles) of chronic illness in treatment as a potential means to enhance the QoL of patients with MD.

Our review of the existing literature found that among patients diagnosed with chronic

illnesses as well as studies of patients with MD, health and symptom severity, social supports, and coping styles had significant associations with their QoL. Consistent with these findings our results indicated that overall health status was positively associated with QoL while symptom severity was negatively associated with patients' QoL, social supports were positively associated with QoL, and the use of negative coping styles (e.g. substance use, blaming) was negatively associated with QoL.

Self-esteem social support was the single best predictor of QoL. This was followed by mental health status (i.e. SF-12 mental health score) and then dizziness, a symptom of MD. The final predictor that entered into the regression model was the use of negative coping strategies. The larger correlations among the various types of social support and QoL suggest that these factors may be more important predictors of QoL than either symptoms and/or coping styles.

The finding that dizziness was an important predictor of QoL is consistent with other studies of patients with MD.^{16,17,45} Additionally given the fact that MD is often misdiagnosed our result may have some applicability to individuals experiencing dizziness as a result of any medical condition. Our findings also suggested that social supports were also positively associated with QoL, and that patients' coping styles had either a positive or negative association with QoL depending on whether individuals used positive or negative coping strategies. This finding was consistent with previous studies¹⁹ that

reported coping styles were associated with perceived functional limitations. Given this, the results of this study confirmed that the factors associated with QoL among this sample of MD respondents (i.e. symptoms, social supports, coping styles) were similar to the factors identified in previous studies of Ménière's patients as well as those associated with patients diagnosed with other chronic illnesses.

A major focus of treatment in patients with MD is reducing symptom severity⁴⁶ which is supported by the findings of study given that two health-related variables (i.e. dizziness and mental health) were significantly associated with the QoL in the regression model. However, the findings from our study also revealed that two psychosocial factors (i.e. social supports and coping styles) were also significantly related to the QoL in our sample. In the regression model, self-esteem social support accounted for 48.7% of the variability in QoL, more than any other predictor. Although the cross-sectional nature of these data does not allow for causal linkages to be established, the results suggest that the treatment of patients with MD could enhance their QoL by incorporating strategies to assist them in strengthening their social supports and enhancing their positive coping skills. In other words, providing patients with supports to provide encouragement and improving their confidence (i.e. self-esteem social support) and helping them minimize the use of negative coping strategies might have a positive impact on their QoL. It seems feasible that low cost programs designed to meet these objectives could be developed as an adjunct to medical interventions and their efficacy tested in randomized controlled trials. For example, Yardley and Kirby⁴⁷ examined the effectiveness of two booklet-based education programs to manage vertigo and dizziness in patients diagnosed with Ménière disease. They found that although reported

adherence levels were low (and strongly associated with outcomes), both education groups reported significantly improved symptom reduction compared to controls who did not have access to these educational programs.

Limitations

There are several limitations to this study. First, although it was our intention that this study be focused on individuals diagnosed with MD, our use of self-reported diagnosis as a study inclusionary criteria in conjunction with the frequency with which MD is misdiagnosed may have resulted in a sample that is broader in scope than MD patients alone (e.g. patients with dizziness as a result of any cause). Second, the characteristics of the sample of respondents in this study do not reflect the characteristics of other patients with MD in general and as such the results may not be generalizable. Our sample consisted of 84% women and 94% Caucasian respondents which is not consistent with a general MD population. The literature indicates that men and women are equally likely to develop MD as are individuals from various racial/ethnic groups.² In addition, the reported age of onset of MD in our sample was 39 years old which is significantly younger than the age of onset reported in the literature⁵ and our percentage of bilateral patients (41%) was higher than what would be anticipated based on the literature.^{3,6} Third the survey data collected in this study are cross-sectional in nature (i.e. measured simultaneously) and thus the temporal nature of the predictors and dependent variables are unknown. This limits the conclusions that can be drawn regarding the causal association of the predictors with patients' QoL, given it is possible that a respondent's QoL could have been poor prior to them being diagnosed with MD. Fourth, despite documenting the study had adequate power for conducting the regression analysis, the

sample size in this study was relatively small and given this the stability of the prediction model is questionable. A larger study involving a more representative sample of MD patients in which cross-validation techniques are used would be beneficial in validating this model. A fifth limitation of this study was the use of self-report symptom measures. Respondents reported the way they perceived their symptoms which may not be consistent with the results obtained from more accurate medical diagnostic testing or psychosocial assessment. However, self-reported symptoms reflect patients' personal perceptions of how symptoms affect them at the time they responded to the survey. Hence they have credibility for the individual at that point in time. The final limitation is that the results may be tautological in nature. The predictors used in this study (e.g. general health, social supports) may in fact be a reframing of QoL itself rather than being conceptually distinct constructs from QoL.

Despite these limitations we believe the findings from this study support the conclusion that the factors associated with the QoL in patients with MD are similar to the factors reported in the literature associated with the QoL of patients diagnosed with other chronic illnesses. In addition, we also believe that emphasizing psychosocial factors as part of the medical treatment of patients' with chronic illnesses would represent a positive improvement in treatment quality, irrespective of whether or not these factors are casually linked to patients' QoL.

Conflict of interest

None declared.

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