Correlations Between Quality of Life and Adaptation Factors Among People With Multiple Sclerosis

Jengliang Eric Hwang, Danielle C. Cvtanovich, Erin K. Doroski, Jessica G. Vajarakitipongse

KEY WORDS
- adaptation, psychological
- multiple sclerosis
- narration
- quality of life
- self concept
- social support

OBJECTIVE. We examined the correlations between quality of life and three adaptation factors—adjusted self-concept, social support, and accessibility—in people with multiple sclerosis (MS).

METHOD. A convenience sample of 68 participants completed the Leeds Multiple Sclerosis Quality of Life scale (LMSQoL) and a questionnaire assessing the three adaptation factors.

RESULTS. We found significant moderate correlations between LMSQoL scores and adjusted self-concept ($r = .56, p < .0001$) and LMSQoL scores and social support ($r = .52, p < .0001$); a significant low correlation was found between LMSQoL and accessibility ($r = .36, p = .003$).

DISCUSSION. Adjusted self-concept, social support, and accessibility were found to be critical in participants’ psychosocial adaptation to the course of MS. Occupational therapy intervention should address these adaptation factors to help clients cope with MS and promote quality of life.


Multiple sclerosis (MS) is a disease of progressive deterioration with unknown cause or cure. It occurs more frequently in younger adults: In 90% of cases, symptoms appear between ages 20 and 50 (Noonan, Kathman, & White, 2002). Common initial symptoms are numbness, weakness, inflammation of the optic nerve, and gait imbalance. At least 70% of people with MS improve after the occurrence of initial symptoms, a pattern indicative of the episodic and unpredictable course of the disease (Noseworthy, Lucchinetti, Rodriguez, & Weinshenker, 2000). As a result of the gradual deterioration of neurological function, people who have MS experience such symptoms as muscle weakness or spasms, difficulties in mobility and coordination (ataxia), fatigue, sensory dysfunctions (hypoesthesia or paresthesia), pain, visual problems (optic neuritis or diplopia), difficulties in speech (dysarthria) or swallowing (dysphagia), difficulties in bladder control and bowel movements, and varying degrees of cognitive impairment. Because of a lack of effective modes for preventing and curing MS, research has focused on the approaches leading to enhanced quality of life (QoL) among people with MS (Benito-León, Morales, Rivera-Navarro, & Mitchell, 2003). Current studies on MS such as the one described in this article have extended beyond the dimension of physical impairments to the emotional and psychosocial consequences of the disease.

Quality of Life Among People Living With MS

MS has great potential to negatively affect QoL. Studies have shown that QoL is generally worse in people with MS than in the general population (Benito-León et al., 2003; Fruewald, Loeffler-Stastka, Eher, Saletu, & Baumhacki, 2001;
Motl, McAuley, Snook, & Gliottoni, 2009; Motl & Snook, 2008). Fruwald and colleagues (2001) found that depression was a strong predictor for reduced QoL in people with MS. The diffuse effects on the central nervous system, ambiguous and fleeting symptoms, early disease onset, and unpredictable course of illness contribute to depression, fear, and anxiety. A substantial body of evidence also supports the relationships between various clinical variables and QoL in people with MS: neurological impairment, fatigue, low physical activity, cognitive dysfunction, and poor self-efficacy were found to correlate with a decline in QoL (Glanz et al., 2010; Janardhan & Bakshi, 2000; Motl et al., 2009; Motl & Snook, 2008). Clinically, it is important to understand the psychosocial impact of MS symptoms and the strategies people use to adapt and maintain their QoL. In particular, recognition of enablers embedded in the psychosocial adaptation process can guide a long-term MS intervention plan leading to enhanced QoL in this client population.

Factors Enhancing Adaptation Among People With MS

We undertook a preliminary qualitative study using narrative inquiry to explore the experiences of three people living with and adjusting to MS (Cvitanovich, Doroski, & Vajarakitipongs, 2009). Narrative analysis yielded three themes—(1) adjusted self-concept, (2) social support, and (3) accessibility—that characterized participants’ process of actively coping with the disease. These three factors are important for facilitating occupational engagement and, therefore, the process of adaptation with MS. The following sections describe the three adaptation factors on the basis of the findings of this preliminary narrative inquiry and the relevant literature.

Adjusted Self-Concept

Like some other devastating diseases (e.g., cancer), MS entails a process of psychological reaction and adjustment that may follow four temporally ordered phases: denial, resistance, affirmation, and integration (Brooks & Matson, 1982). As participants in the narrative inquiry study recognized, coping is a process: “It takes time, I think; you have to go through stages to reach that point” (Cvitanovich et al., 2009, p. 17). Adaptation over time involves not only physical but also psychosocial and spiritual adjustments; values and beliefs, as well as relationships to others and one’s surroundings, all change. During the initial adjustment, one’s identity as an independent adult, worker, and helper may be supplanted by negative self-concepts (Irvine, Davidson, Hoy, & Lowe-Strong, 2009). Accepting the diagnosis and taking action to maintain health and a positive outlook are essential to regaining a sense of well-being (Cvitanovich et al., 2009). The coping process produces a change in self-concept that temporally and metaphorically parallels changes in physical and functional status; namely, the person’s adjusted self-concept embraces the effects of MS. In the preliminary study, participants came to believe that their ability to cope with MS was one of their strengths. They tended to appreciate the small victories achieved from day to day, such as walking with only a cane or making their own breakfast (Cvitanovich et al., 2009).

Social Support

Participants in the narrative inquiry study highly valued the dependability of various social support systems (Cvitanovich et al., 2009). Social support encompasses three basic functions: (1) emotional, (2) instrumental, and (3) informational. Family, friends, and significant others were identified as sources of emotional support (e.g., love and affection) and instrumental support (e.g., helping hands); as 1 participant described it, “My family is like rock. So it’s always going to be like that if I need them” (Cvitanovich et al., 2009, p. 23). Important sources of informational support included health care professionals and, participants strongly agreed, MS peer support groups. Sharing experiential knowledge with others in a similar situation provides group members with strategies for coping more effectively with the stresses imposed by MS. Social support plays an important role throughout the course of MS; not only does it empower people to become more independent, but it also gives them the opportunity to depend on loved ones when necessary. Several studies have identified social support as a predictor of perceived health status, both physical and mental, through its stress-mediating and stress-buffering role (Krokavcova et al., 2008; Mohr, Classen, & Barrera, 2004; Schwartz & Frohner, 2005).

Accessibility

Lack of accessibility hinders the ability of people with MS to move about in the community and ultimately leads to a decrease in productive and social activities. Lack of affordable mobility aids, inaccessible public transportation, and physical barriers limit social interaction and occupational participation and are a factor in the onset of depression; as 1 participant described it, “Being trapped in the house is depressing, I think, for anybody, and it’s hard for people to cope with” (Cvitanovich et al., 2009, p. 25). Access to quality health care, reliable medical
information, and institutional support was also a concern for participants in the preliminary narrative study (Cvitanovich et al., 2009, p. 25). They expressed frustration about the ambiguous and deferred diagnostic and treatment information health care professionals provided. Moreover, they described red tape as a barrier to obtaining community resources and institutional supports (e.g., centers for independent living). A few population-based studies that focused on the spectrum of disability in MS have documented the need for enhanced resource accessibility to promote more independent and satisfying community living for people with MS (Gottberg et al., 2008; McDonnell & Hawkins, 2001; Rodriguez et al., 1994).

**Purpose of the Current Study**

QoL is recognized as an important outcome of occupational therapy. The role of occupational therapy practitioners is to provide clients with the conditions necessary for satisfactory QoL (American Occupational Therapy Association [AOTA], 2008). Our study sought to determine which factors in the lived experience of MS correlate with QoL of people coping with the disease. The specific factors examined—adjusted self-concept, social support, and accessibility—were thematically derived from the preliminary narrative inquiry study on the personal experiences of living with and adjusting to MS (Cvitanovich et al., 2009).

**Method**

**Design**

This research was a correlational study exploring relationships between QoL and three important adaptation factors of people with MS: adjusted self-concept, social support, and accessibility.

**Participants**

The study sample consisted of 68 community-dwelling adults with MS. Convenience and snowball sampling methods were used to recruit participants through community sites in southern California such as MS peer support groups, service programs by the National Multiple Sclerosis Society, and community-based rehabilitative facilities. Each participant met the following inclusion criteria: a documented diagnosis of MS, age 18 yr, noninstitutionalized living arrangement, and adequate cognitive and language capabilities to complete a questionnaire in English. People who had other medical diagnoses that may cause further disabling conditions (e.g., cerebrovascular accident, diabetic peripheral neuropathy, major depression) were excluded. We or facility staff screened for all of these recruitment criteria during the initial contact with each prospective participant.

**Instrumentation**

QoL was measured using the Leeds Multiple Sclerosis Quality of Life scale (LMSQoL; Ford et al., 2001). The LMSQoL is an eight-item disease-specific measure of QoL that addresses tiredness, loneliness, energy, worries about health, family relationships, appearance, attitudes of other people, and the future. Data from the developmental and testing phases of the LMSQoL supported both reliability and validity of the scale (Ford et al., 2001). Good internal consistency (Cronbach’s α = .79) and test–retest reliability (r = .85) were reported. Construct validity was substantiated through its high correlation (r = .83) with the General Well Being Index (Hunt & McKenna, 1992) and relatively low correlation (r = .39) with the Short-Form Health Survey (SF–36) Physical Function scale (Ware & Sherbourne, 1992), confirming that the LMSQoL is a better measure of well-being than of specific physical function in people with MS.

In addition, the unidimensionality of the eight items of the LMSQoL was established through goodness of fit, assessed using the Rasch measurement model (Ford et al., 2001). A 0–3 rating scale (0 = not at all, 1 = sometimes, 2 = quite often, 3 = most of the time) was originally designed for respondents to indicate their experiences during the past 30 days. However, because our study focused on QoL as perceived by participants rather than on time-specific outcomes, the frequency rating scale was modified to a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

We developed an 18-item questionnaire that included three MS adaptation scales (Adjusted Self-Concept, Social Support, Accessibility). Each adaptation factor scale consisted of six questions reflecting the relevant thematic findings from the narrative inquiry study. The Adjusted Self-Concept scale explored participants’ psychosocial acceptance of the diagnosis and adjustment to the symptoms and functional limitations of the disease. The Social Support scale measured participants’ use of social support as a means to adjust to the diagnosis and maintain occupational participation. The Accessibility scale assessed participants’ ability to gain access to public places, health care and community services, assistive and mobility devices, transportation, and medical information.

Face validity was taken into consideration during question formulation. The questionnaire was piloted through...
the methods of expert review and field pretesting. Expert review consisted of two occupational therapists who specialized in the field of MS reviewing the questionnaire and providing feedback on the relevance of each question. Subsequently, field pretesting was completed with 3 respondents who had participated in the narrative inquiry study. The respondents were asked to complete the questionnaire and provide feedback on the content and understandability of the questions. As a result of the pilot testing, some subtle changes were made to item wording but not to the essence of the content, to enhance the clarity of the questionnaire. Consistent with the modified LMSQoL, the 5-point Likert scale was used in the questionnaire.

For ease of administration, both the LMSQoL and the three MS adaptation factor scales were formatted into one questionnaire comprising Sections 1 and 2, respectively. Moreover, a demographic section was included to gather information on gender, age, marital status, race, income, and time elapsed since diagnosis. Responses to negatively worded items were reversed for scoring. The possible total score for the LMSQoL ranged from 8 to 40; a higher score indicated a more favorable level of QoL. Similarly, the score range for each of the three MS adaptation factor scales was 6–30; a higher score denoted more attributes of the adaptation factor perceived by the participant.

Procedures

We received approval from the California State University, Dominguez Hills, Institutional Review Board before beginning data collection. We contacted the community sites that offered services and support to people with MS to obtain permission and ask for their assistance in selecting and recruiting participants. In addition, participants were asked to help recruit acquaintances who met the inclusion criteria. Participants received from us or facility staff a packet that contained a cover letter, an informed consent document, the questionnaire along with instructions, and a self-addressed stamped envelope. If it was their preference, participants received and returned the materials by e-mail. We took measures to ensure the confidentiality of participants throughout the procedures.

Data Analysis

Descriptive statistics and frequency analysis were used to summarize participants’ demographics and responses to the questionnaire. Pearson product–moment correlations were used to examine the relationships between the results of the LMSQoL and the three adaptation factor scales. The following cutoffs were used to interpret the strength of the relationships: an r of 0–.20 = a negligible correlation; .20–.40 = a low correlation; .40–.60 = a moderate correlation; .60–.80 = a high correlation, and .80–1.00 = a very high correlation (Tomita, 2006). Cronbach’s α was conducted to determine reliability; according to the commonly accepted rule of thumb, an α of .60–.79 indicates acceptable reliability, and an α of ≥.80 suggests good reliability (Allen & Yen, 2002). Moreover, one-way analysis of variance (ANOVA) was used to detect group differences in the results on the basis of age and time since diagnosis. The significance level was set at .05. All of the statistical analyses were performed using SPSSPC+ Version 17.0 software (SPSS, Inc., Chicago).

Results

Although 68 participants were recruited for the study, 2 were excluded from data analysis because of a large portion of incomplete responses to the questionnaire. The demographic and personal characteristics of the remaining 66 participants are shown in Table 1. Most participants (78.8%) were women between ages 36 and 52 (42.4%) or ages 53 and 70 (40.9%). More than half of the participants had been living with the disease for ≥10 yr (10–15 yr, 24.2%; >15 yr, 36.4%). Regarding marital status, 53.1% reported a marital or romantic relationship, and 46.9% reported being single, divorced, or widowed. One-way ANOVA showed that age and time since diagnosis were not significantly correlated with the research variables.

The frequency distribution of responses to each LMSQoL item and the three MS adaptation factor scales are displayed in Tables 2 and 3. On the LMSQoL, the most commonly endorsed items were “I have felt tired,” “I have worried about my health,” and “My health has affected my relationships with my family.” The most often endorsed items for the three adaptation factor scales were “I appreciate the ‘small victories’ in life, such as getting out of bed in the morning despite pain or fatigue” (adjusted self-concept), “Support from my family and friends has helped me attend social gatherings” (social support), and “I have access to reliable and convenient medical information relevant to my condition” (accessibility).

Table 4 lists the means, standard deviations, and internal consistencies (Cronbach’s α) of the LMSQoL and the three MS adaptation factor scales. The mean of the LMSQoL appeared to be less favorable than the means of the three scales, given the highest possible score of 40 for the LMSQoL in contrast to that of 30 for each scale. The resultant Cronbach’s α values indicated good internal consistency reliability for the LMSQoL and
acceptable internal consistency reliability for all three adaptation factor scales.

Significant moderate correlations were found between the LMSQoL and the Adjusted Self-Concept scale \( (r = .56, p < .0001) \) and between the LMSQoL and the Social Support scale \( (r = .52, p < .0001) \). A significant low correlation was found between the LMSQoL and the Accessibility scale \( (r = .36, p = .003) \).

### Discussion

The broad spectrum of MS symptoms may significantly impinge on daily activities and routines of those living with the disease; therefore, it is important that occupational therapy practitioners be fully aware of how these people adapt to their symptoms and maintain their QoL throughout the course of the disease. In the preliminary narrative inquiry study (Cvitanovich et al., 2009), participants identified three critical factors—adjusted self-concept, social support, and accessibility—that were deeply embedded in their personal experiences of living with and adjusting to MS. Our study further explored the degree to which these three factors correlate with QoL in people with MS. The results demonstrated significant low to moderate correlations between the three factors and QoL. In fact, given the multidimensionality and complexity of QoL issues with the disease, high correlations between these variables would not be anticipated.

Perceived QoL among participants as measured by the LMSQoL, a well-established disease-specific measure, was not favorable (i.e., a mean of 22.89 of a highest possible score of 40). This finding is similar to the relatively low mean score on the LMSQoL reported by Ford and colleagues (2001) during their development of the instrument. Indeed, cumulative research evidence has confirmed that people diagnosed with MS generally perceive less favorable QoL because of the wide range of deteriorating physical and psychosocial conditions caused by the disease (Glanz et al., 2010; Janardhan & Bakshi, 2000; Motl et al., 2009; Motl & Snook, 2008). Accordingly, researchers have suggested that service and support provided to people with MS target the outcome of enhanced QoL.

The progressive deterioration associated with MS requires an ongoing adaptation process that involves frequent adjustments of self-concept, constant social support, and accessible resources. Because this ongoing adaptation is such an integral part of the lived experience of MS, it can be inherently tied to the QoL of those who have it. Therefore, greater awareness of correlations between the adaptation factors and QoL is likely to lead to better recognition of the scope of service for this client population.

The current study demonstrates that adjusted self-concept moderately correlates with QoL in people with MS. This finding echoes a previous study reporting that people with MS who demonstrated acceptance of the disease were more likely to express an increased level of satisfaction with QoL (Aronson, 1997). Moreover, Schwartz (1999) found that people with MS who participated in a training program to improve their coping skills showed an improvement in their overall well-being. MS can negatively affect various aspects of a person’s self-concept and identity, and therefore ongoing psychosocial adjustment to the disease plays an important role in bringing about positive changes in the person’s values and outlook. As evidenced by the findings of the current study, many participants highly endorsed that they appreciated the small victories they achieved from day to day, such as getting out of bed in the morning despite pain or fatigue.

<table>
<thead>
<tr>
<th>Gender</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Female</td>
<td>52</td>
<td>78.8</td>
</tr>
<tr>
<td>Male</td>
<td>14</td>
<td>21.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ethnicity</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>36</td>
<td>54.5</td>
</tr>
<tr>
<td>Hispanic</td>
<td>18</td>
<td>27.3</td>
</tr>
<tr>
<td>African American</td>
<td>7</td>
<td>10.6</td>
</tr>
<tr>
<td>Asian/Pacific Islander</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>4.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18–35 yr</td>
<td>10</td>
<td>15.2</td>
</tr>
<tr>
<td>36–52 yr</td>
<td>28</td>
<td>42.4</td>
</tr>
<tr>
<td>53–70 yr</td>
<td>27</td>
<td>40.9</td>
</tr>
<tr>
<td>≥71 yr</td>
<td>1</td>
<td>1.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital status</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>31</td>
<td>47.0</td>
</tr>
<tr>
<td>Divorced</td>
<td>13</td>
<td>19.7</td>
</tr>
<tr>
<td>Single</td>
<td>16</td>
<td>24.2</td>
</tr>
<tr>
<td>Widowed</td>
<td>2</td>
<td>3.0</td>
</tr>
<tr>
<td>In a relationship, not married</td>
<td>4</td>
<td>6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Time since diagnosis</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5 yr</td>
<td>12</td>
<td>18.2</td>
</tr>
<tr>
<td>6–10 yr</td>
<td>14</td>
<td>21.2</td>
</tr>
<tr>
<td>11–15 yr</td>
<td>16</td>
<td>24.2</td>
</tr>
<tr>
<td>&gt;15 yr</td>
<td>24</td>
<td>36.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Yearly income</th>
<th>n</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0–20,000</td>
<td>18</td>
<td>27.3</td>
</tr>
<tr>
<td>$20,001–40,000</td>
<td>18</td>
<td>27.3</td>
</tr>
<tr>
<td>$40,001–60,000</td>
<td>13</td>
<td>19.7</td>
</tr>
<tr>
<td>$60,001–80,000</td>
<td>5</td>
<td>7.6</td>
</tr>
<tr>
<td>$80,001+</td>
<td>5</td>
<td>7.6</td>
</tr>
<tr>
<td>No answer</td>
<td>7</td>
<td>10.6</td>
</tr>
</tbody>
</table>

Table 1. Participant Demographics and Personal Information \( (N = 66) \)
Similarly, a significant moderate correlation was found between perceived level of social support and QoL in people with MS. Most participants agreed that support from family and friends helped them adjust to the diagnosis, maintain their health, and participate in productive and social activities. As Maton (1988) suggested, social support was strongly related to sense of well-being among people with MS, likely because of increased opportunities for occupational participation. Social support was also associated with coping, psychological and physical health, and QoL among veterans diagnosed with MS, whereas lack of social support was a risk factor for poor occupational performance and participation (Williams, Turner, & Hatzakis, 2004). Because many participants in the current study were recruited from MS peer support groups, support from fellow group members (included as "friends" in the questionnaire) may also constitute an important factor in their successful adaptation to the disease. Krokavcova and colleagues (2008) confirmed that the most effective support givers are usually similar others; people with MS can help each other maintain their health status by exchanging information and strategies for coping with the disease-related conditions.

A low but significant correlation was found between accessibility and QoL. As discussed previously, lack of access to needed services and resources can lead to restricted occupational performance and adverse psychological outcomes. Surprisingly, the results failed to show a stronger correlation between the variables. The Accessibility scale included six different areas of access: (1) health care, (2) disease-related information, (3) mobility devices, (4) assistive devices, (5) transportation, and (6) public places. The intent was to present the broad accessibility issues related to MS as a whole; the measure may have appeared too wide ranging to elicit a strong perception from each participant. That is, given the highly individualized course of MS and the variation among participants in time since diagnosis, some or many of the items in this scale may not have contextually applied to a given participant and thus may have moderated the correlation with the QoL measure. This possibility was also evidenced in part by the relatively low internal consistency in this scale. Interestingly, existing MS studies on the correlation between QoL and accessibility issues have focused mostly on one specific area of accessibility, such as wheelchairs or assistive devices (e.g., DeVitt, Chau, & Jutai, 2003; Stuifbergen, Brown, & Phillips, 2009), rather than on a broader view of access to the multiple resources needed. Future MS studies covering a wide spectrum of accessibility issues may need to use a more contextually relevant and individualized measure.

**Limitations**

The small convenience sample of participants limits the generalizability of this study. As mentioned, a high percentage of the participants were recruited from MS peer support groups; Stuifbergen (1995) found that people with MS who were involved in health-promoting behaviors, including participation in support groups, reported better QoL. Therefore, it is possible that our specific sampling method and source favored the results of the study. In addition, this study did not attend to the distinction among different subtypes of MS; participants were not asked to classify their diagnosis in the questionnaire. Therefore, caution in interpreting the results is warranted because of variations in severity and patterns of progression among the various subtypes of the disease, which may have been mixed in this study.

So as not to impose a heavy burden on participants, we sought to develop a relatively brief but sound questionnaire to measure all the research variables (i.e., QoL, adjusted self-concept, social support, accessibility). Section 1 of the questionnaire (QoL) consisted of the 8-item LMSQoL with a slight modification to the rating scale for the purpose of this study. We hope that this modification...

---

**Table 2. Responses to LMSQoL Items (N = 66)**

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly Disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly Agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. My health has affected my relationships with my family.</td>
<td>15.2</td>
<td>15.2</td>
<td>19.7</td>
<td>31.8</td>
<td>18.2</td>
</tr>
<tr>
<td>2. I have felt lonely.</td>
<td>13.6</td>
<td>24.2</td>
<td>22.7</td>
<td>28.8</td>
<td>9.1</td>
</tr>
<tr>
<td>3. I have felt good about my appearance.</td>
<td>1.5</td>
<td>21.2</td>
<td>31.8</td>
<td>30.3</td>
<td>10.6</td>
</tr>
<tr>
<td>4. I have worried about my health.</td>
<td>4.5</td>
<td>10.6</td>
<td>19.7</td>
<td>33.3</td>
<td>31.8</td>
</tr>
<tr>
<td>5. I have worried about others' attitudes toward me.</td>
<td>7.6</td>
<td>12.1</td>
<td>37.9</td>
<td>33.3</td>
<td>7.6</td>
</tr>
<tr>
<td>6. I have felt tired.</td>
<td>1.5</td>
<td>4.5</td>
<td>15.2</td>
<td>40.9</td>
<td>37.9</td>
</tr>
<tr>
<td>7. I have had as much energy as usual.</td>
<td>19.7</td>
<td>47.0</td>
<td>15.2</td>
<td>10.6</td>
<td>7.6</td>
</tr>
<tr>
<td>8. I have felt happy about the future.</td>
<td>4.5</td>
<td>22.7</td>
<td>37.9</td>
<td>27.3</td>
<td>7.6</td>
</tr>
</tbody>
</table>

*Note: Responses may not total 100% as a result of missing data. LMSQoL = Leeds Multiple Sclerosis Quality of Life Scale.*
to the response categories did not compromise the established psychometric properties of the LMSQoL; our examination of the reliability of this modified LMSQoL showed a slightly higher level of internal consistency than the original version. We developed Section 2 of the questionnaire (three MS adaptation factors) using the themes yielded by the preliminary narrative inquiry study (Cvitanovich et al., 2009). The psychometric properties of the three scales in this section may have been limited, although content validity was initially established during the pilot testing phase, and reliability was confirmed through the analysis of internal consistency. As discussed earlier, some items in the Accessibility scale may not be contextually applicable to all people with MS.

Moreover, because of the nature of a correlational study design, other potentially confounding personal and contextual factors (e.g., culture, socioeconomic status, subtypes of the disease) were not adequately controlled, and most notably, the cause-and-effect relationship and dynamic interaction between each of the adaptation factors and QoL could not be determined conclusively. Future cohort studies using large randomized samples and systematic control and analysis of multiple factors are suggested to strengthen both the validity and the depth of the exploratory findings of this study.

Clinical Implications

Research has consistently demonstrated that QoL is compromised in people with MS (Benito-León et al., 2003; Motl et al., 2009; Motl & Snook, 2008). QoL is a recognized outcome of occupational therapy services (AOTA, 2008). Identifying specific variables associated with QoL can assist occupational therapy practitioners in providing holistic interventions for clients with MS. Practitioners can use the three critical contributors—adjusted self-concept, social support, and accessibility—to examine more closely the client’s process of adjusting to and coping with the disease. The intervention plan should take into consideration potential differences in all the personal and contextual factors that may have an effect on the client’s overall QOL.

Table 3. Responses to Items on the Three MS Adaptation Factor Scales: Adjusted Self-Concept, Social Support, and Accessibility (N = 66)

<table>
<thead>
<tr>
<th>Item</th>
<th>Strongly disagree (%)</th>
<th>Disagree (%)</th>
<th>Neutral (%)</th>
<th>Agree (%)</th>
<th>Strongly agree (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adjusted self-concept</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I am uncomfortable telling others that I have MS.</td>
<td>10.6</td>
<td>27.3</td>
<td>28.8</td>
<td>27.3</td>
<td>6.1</td>
</tr>
<tr>
<td>2. I appreciate the “small victories” in life, such as getting out of bed in the morning despite pain or fatigue.</td>
<td>1.5</td>
<td>4.5</td>
<td>12.1</td>
<td>48.5</td>
<td>33.3</td>
</tr>
<tr>
<td>3. I feel proud of my accomplishments.</td>
<td>3.0</td>
<td>7.6</td>
<td>21.2</td>
<td>40.9</td>
<td>27.3</td>
</tr>
<tr>
<td>4. I feel that my future seems hopeless.</td>
<td>30.3</td>
<td>33.3</td>
<td>16.7</td>
<td>13.6</td>
<td>6.1</td>
</tr>
<tr>
<td>5. I have learned to cope with the disease through a variety of strategies.</td>
<td>1.5</td>
<td>6.1</td>
<td>13.6</td>
<td>57.6</td>
<td>21.2</td>
</tr>
<tr>
<td>6. I believe I am an encouraging example of a person with MS.</td>
<td>3.0</td>
<td>7.6</td>
<td>22.7</td>
<td>48.5</td>
<td>18.2</td>
</tr>
<tr>
<td>Social support</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Support from my family and friends has motivated me to take care of my health.</td>
<td>3.0</td>
<td>7.6</td>
<td>25.8</td>
<td>43.9</td>
<td>19.7</td>
</tr>
<tr>
<td>2. Support from my family and friends has helped me gain needed resources.</td>
<td>0.0</td>
<td>12.1</td>
<td>45.5</td>
<td>27.3</td>
<td>15.2</td>
</tr>
<tr>
<td>3. Support from my family and friends has helped me make modifications to my home or car.</td>
<td>1.5</td>
<td>4.5</td>
<td>42.4</td>
<td>40.9</td>
<td>10.6</td>
</tr>
<tr>
<td>4. Support from my family and friends has helped me return to employment or volunteer work.</td>
<td>7.6</td>
<td>22.7</td>
<td>34.8</td>
<td>25.8</td>
<td>9.1</td>
</tr>
<tr>
<td>5. Support from my family and friends has helped me adjust to my diagnosis.</td>
<td>1.5</td>
<td>16.7</td>
<td>18.2</td>
<td>47.0</td>
<td>16.7</td>
</tr>
<tr>
<td>6. Support from my family and friends has helped me attend social gatherings.</td>
<td>0.0</td>
<td>13.6</td>
<td>18.2</td>
<td>51.5</td>
<td>16.7</td>
</tr>
<tr>
<td>Accessibility</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. I have access to appropriate medical care.</td>
<td>3.0</td>
<td>6.1</td>
<td>13.6</td>
<td>47.0</td>
<td>28.8</td>
</tr>
<tr>
<td>2. I have access to reliable and convenient medical information relevant to my condition.</td>
<td>0.0</td>
<td>13.6</td>
<td>7.6</td>
<td>48.5</td>
<td>30.3</td>
</tr>
<tr>
<td>3. I have access to mobility devices such as a walker or power wheelchair.</td>
<td>3.0</td>
<td>10.6</td>
<td>28.8</td>
<td>34.8</td>
<td>22.7</td>
</tr>
<tr>
<td>4. The high cost of assistive devices prevents me from obtaining them.</td>
<td>6.1</td>
<td>27.3</td>
<td>33.3</td>
<td>25.8</td>
<td>7.6</td>
</tr>
<tr>
<td>5. I have access to a reliable and convenient means of transportation.</td>
<td>4.5</td>
<td>4.5</td>
<td>21.2</td>
<td>45.5</td>
<td>24.2</td>
</tr>
<tr>
<td>6. I can easily access public places such as movie theaters, grocery stores, or church.</td>
<td>3.0</td>
<td>12.1</td>
<td>18.2</td>
<td>45.5</td>
<td>21.2</td>
</tr>
</tbody>
</table>

Note: Responses may not total 100% as a result of missing data. MS = multiple sclerosis.

Table 4. Analysis of Scores on the LMSQoL and the Three MS Adaptation Factor Scales (N = 66)

<table>
<thead>
<tr>
<th>Scale</th>
<th>M</th>
<th>SD</th>
<th>Cronbach’s α</th>
</tr>
</thead>
<tbody>
<tr>
<td>LMSQoL</td>
<td>22.89</td>
<td>6.45</td>
<td>.80</td>
</tr>
<tr>
<td>Adjusted Self-Concept</td>
<td>22.09</td>
<td>4.84</td>
<td>.73</td>
</tr>
<tr>
<td>Social Support</td>
<td>21.08</td>
<td>3.98</td>
<td>.72</td>
</tr>
<tr>
<td>Accessibility</td>
<td>22.12</td>
<td>4.32</td>
<td>.65</td>
</tr>
</tbody>
</table>

Note. LMSQoL = Leeds Multiple Sclerosis Quality of Life Scale (Ford et al., 2001); M = mean; MS = multiple sclerosis; SD = standard deviation.
Occupational therapy practitioners are uniquely trained to focus on a client’s physical, social, psychological, and cognitive attributes rather than on deficits. Through the therapeutic use of self, they reinforce a positive self-image, reorganize priorities, and provide the client with appropriate means and strategies to achieve self-confidence. In recognition of the importance of social support, occupational therapy practitioners can help people with MS establish the essential skills and resources (e.g., caregiver education, support groups, volunteer experience) to widen their support network. In addition, occupational therapy practitioners use their expertise in advocacy training, assistive technology, and environmental modification to help clients who have MS gain access to the services and tools required for maintaining an optimal level of independence in self-care, work, and leisure.

Acknowledgments

We thank the following organizations for their generous support of this research: Familia Unida Living With MS, Balance Rehabilitation, Long Beach Adult Day Health Care Center, and the Los Angeles chapter of the National Multiple Sclerosis Society. We also thank the research participants for their time and contributions to this study.

References


