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The Effect of Fatigue and Pain Self-Efficacy on Health-Related Quality of Life Among Patients with Multiple Sclerosis

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ABSTRACT

Introduction: Health-related quality of life is a major issue among patients with Multiple sclerosis (MS). Aim: To explore the effect of fatigue and pain self-efficacy on health-related quality of life among patients with MS. Methods: Between March and May 2018, 85 MS patients from a large Hospital of Athens region completed the questionnaires: a) Missoula-VITAS Quality of Life Index-15, which examines 5 dimensions of quality of life, b) Pain Self Efficacy Questionnaire which measures the pain self-efficacy that an individual perceives, c) Fatigue Assessment Scale (FAS) which measures fatigue, d) a questionnaire about the sociodemographic elements. Statistical analysis was performed using the IBM SPSS Statistics version 21. The significance level was set up to 0.001. Results: Fatigue might predict the dimension of quality of life "Function" while Pain Self Efficacy might, also, predict the dimension of quality of life "Interpersonal". A strong correlation was found between the dimensions of quality of life "Well-being" and "Transcendent" and between "Interpersonal" and Pain Self-Efficacy. The total score of fatigue was strongly correlated with Physical Fatigue and very strongly correlated with Mental Fatigue. Conclusion: Fatigue and Pain Self-Efficacy are important predictors of the dimensions of quality of life among patients with MS. Pain in MS has to be taken into serious consideration in every patient with MS.

Keywords: fatigue, pain self-efficacy, multiple sclerosis, quality of life.

1. INTRODUCTION

Multiple sclerosis (MS) is a chronic neurological condition with many and different symptoms. MS symptoms are variable and unpredictable such as fatigue which occurs in about 80% of people, pain, spasms, weakness (which results from deconditioning of unused muscles or damage to nerves that stimulate muscles), depression and cognitive problems (1).

The symptom of pain is also a common feature of well-established MS and has been documented as a significant symptom experienced by patients with MS (2). Chronic pain is usually associated with myelopathy and is common in women and in older individuals with duration of disease greater than 5 years. The major chronic pain syndromes are back pain, and painful leg spasms (3). Pain is present in more than half of the cases and it adopts many aspects which most of the times ruin the patients’ quality of life. The ability to develop patients' pain self-efficacy in order to rely on them contributes positively to their Quality of life (QoL). When patients manage the various symptoms of the disease and meet their daily needs, they are able to prioritize and cope well with everyday life, thus improving their QoL (4).

Fatigue is the most prevalent issue for MS patients. It presents in 75-95% of patients with MS and it is reported as the worst symptom of the disease, which is associated with various health problems. Fatigue is defined as a feeling of lack of energy, weakness, and aversion to effort. Fatigue can occur at all stages of the disease and can affect QoL, depression, anxiety, motor function, and sleep patterns (5, 6).

Studies have shown that fatigue has a substantial impact on QoL in persons with MS by reducing physical stamina, interfering with the performance of responsibilities at home and work, and limiting social duties. Apart from their daily activities which are restricted, patients' social relationships are limited, as well. This happens because many of these patients...
confine their activities at home because of their symptoms, the fatigue or the pain that may feel or because they have to take their medications (interferon or cortisone injections) (7). In addition, fatigue has been inversely correlated with aspects of QoL in cross-sectional studies of MS patients (8, 9). Fatigue is accused of the poor QoL more than weakness, spasticity, motor problems or urinary disorders.

2. AIM

The aim of the study was to explore the effect of fatigue and pain self- efficacy on health-related QoL among patients with multiple sclerosis (MS).

3. METHODS

Patients

In this cross-sectional study, 114 participants from "Agioi Anargyroi" Hospital of Kifissia were recruited. "Agioi Anargyroi" Hospital of Kifissia is one of the largest hospitals for patients with variable neurological health issues. The inclusion criteria were: >18 years old, be Greeks, able to understand and speak fluently the Greek language and have the cognitive ability to answer the questionnaires. The participants who were not Greek, couldn’t write or had problems with their verbal speech were excluded from the study. The final sample consisted of 85 patients (response rate 74, 5%) (Figure 1). The study took place between March-May 2018.

Measures

Missoula-VITAS Quality of Life Index-15 (MVQoLI-15)

The first instrument was the Greek version of Missoula-VITAS Quality of Life Index-15 (MVQoLI-15) in order to measure HRQoL. (10) and includes information about a chronic illness (11). The tool seeks to describe the qualitative and subjective experience of QoL in a way that can be quickly interpreted by professional caregivers (12, 13). The five dimensions of QoL that are examined in the MVQoLI-15 are Symptoms, Function, Interpersonal, Well-Being and Transcendence. The total score of each dimension reflects the extent that this dimension affects the QoL of patients. Higher scores indicate better QoL. The average score of total QoL ranges from 0 to 30. This scale has been translated and culturally adapted to the Greek data (10). Psychometric properties of the Greek version have been studied (14, 15).

Fatigue Assessment Scale (FAS)

The second instrument was the Fatigue Assessment Scale (FAS). The original form of FAS was constructed in 2003 and it consists of 10 questions (16) which collect information related to the perceived fatigue. Five questions are related to Physical Fatigue and the other five to Mental Fatigue. The responses rate on a 7 Likert point scale (1=never to 7=always). Consequently, the score varies between 10-50. The patient’s responses to 10 questions are summed in order to construct the score. There are cutoff points which assist in recognizing who are fatigued, not-fatigued and extremely fatigued (17). Patients are categorized as “non-fatigued” if the FAS score is below 22, “fatigued” if the FAS score is higher or equal to 22 and “extremely fatigued” if the FAS score is higher or equal to 35 (17). The FAS has been, also, used in patients with sarcoidosis (18), and under hemodialysis (19). Psychometric properties of the Greek version have been studied among patients with chronic illness (19).

Pain Self-Efficacy Questionnaire (PSEQ)

The third instrument was the Pain Self-Efficacy Questionnaire (PSEQ). The PSEQ is a self-reported instrument which evaluates pain self-efficacy beliefs in patients with chronic pain. Each item is rated by selecting a number on a 7 Likert point scale (0 = not at all confident to 6 = completely confident). A total score is calculated by summing the scores for each of the 10 items, yielding a maximum total score of 60. Higher scores reflect stronger pain self-efficacy beliefs. The PSEQ has been used in patients undergoing hemodialysis (20) in order to examine the psychometric properties of the Greek version (Cronbach’s Alpha 0.98) while in another study (21) QoL and pain self-efficacy were explored, also, among hemodialysis patients.

Sociodemographic elements (gender, age, marital status, education, working environment, years under therapy and years of having MS) were recorded.

Statistical analysis

In this study, a statistical analysis was made in order to measure the variables. Concerning the descriptive statistics, frequencies were made in each variable. Spearman rho test was performed in order to explore patterns of correlations between the dimensions of QoL, Fatigue, and Pain Self-Efficacy. In addition, simple and multiple linear regression models were performed in order to investigate if fatigue and pain self-efficacy could predict each dimension of QoL. Kruskal- Wallis test was performed in order to evaluate the dimensions of the variables with sociodemographic characteristics and if there are statistical differences. The IBM SPSS Statistics 21 was used to analyze the data and the level of significance was set up to .001.

Ethical considerations

The study was conducted according to the ethical standards of the Helsinki Declaration of 1975, as revised in 2000. After having received the Ethical approval from the Scientific Council of the "Agioi Anargyroi" Hospital of Kifissia (10/02/2018), individuals were informed by the researchers about the study, the voluntary participation, the anonymity, the withdraw rights and, also, that the approval has been given for this study. The anonymity of the participants was protected and the results obtained were used solely for scientific purposes. Signed informed consent was obtained from all individuals.

4. RESULTS

Descriptive statistics showed that 77.6% of the individuals participated in the study were females (n=66) and 22.4% were males (n=19). The mean age of the patients was 40.02 years (Table 1).

The mean score of MVQoLI-15 was 45.65 (SD ±34.11), the mean score of PSEQ was 41.34 (SD±11.21) while the mean FAS score was 42.27 (SD=3.54) (Table 2). A percent of 12.9% (n=11) of patients were not-fatigued, 84.7% (n=72) were fatigued and 2.35% (n=2) were extremely fatigued.

A series of Spearman’s rho correlations were conducted in order to evaluate the differences between the research’s variables. As the below table reports (Table 3), strong positive correlations were found between Total Fatigue and Physical Fatigue (r(85)=0.87, p<0.01), Total Fatigue and Mental Fatigue (r(85)=0.76,
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A standard simple linear regression was employed to determine if fatigue scores significantly predict the domains of MVQoL-15. The overall model was significant (F[1, 83] = 4.18, p = 0.044) at function, explaining the 4% (R² = 0.04) of the variance (or 0.04 adjusted R²) in Fatigue scores. Fatigue is a negative weak significant predictor of Function (β = -0.22, t = -2.05, p = 0.044), suggesting that patients who experience low levels of fatigue have better functioning.

Multiple linear regressions were run to determine if pain self-efficacy scores significantly predict the domains of QoL. The overall model was significant (F[3, 81] = 29.89, p ≤ 0.001) at Transcendent, Interpersonal, and Well-being, explaining the 53% (R² = 0.53) of the variance (or 0.51 adjusted R²) in Pain Self-Efficacy scores. Of the three predictors, only the domain of Interpersonal was a significant moderate positive predictor of Pain Self-Efficacy (β = 0.51, t = 5.19, p ≤ 0.001), suggesting that patients with high levels of Pain Self-Efficacy scores have also, better interpersonal relationships. Transcendent (β = 0.21, t = 1.65, p = 0.102) and Well-being (β = 0.09, t = 0.72, p = 0.475) were positive weak non-significant predictors of pain.

According to the Kruskal-Wallis test there was a statistically significant difference in Interpersonal score between the different family status (H(4) = 13.25, p = 0.01) with a mean rank Interpersonal score of 29.95 for unmarried who live alone, 49.75 for married with no kids, 45.73 for unmarried who live with their parents, 37.78 for married with kids and 59.44 for unmarried who live with their partner. In addition, a statistically significant difference was also observed in the Transcendent score between the different family status (H(4) = 16.32, p = 0.00) with a mean rank Transcendent score of 31.18 for unmarried who live alone, 48.94 for married with no kids, 45.09 for unmarried who live with their parents, 36.51 for married with kids and 62.53 for unmarried who live with their partner. There was not found any other statistically difference for the rest dimensions of QoL, such as the Symptom, the Function and the Well-being.

5. DISCUSSION
The purpose of the present study was to explore the relationship between fatigue, pain self-efficacy and QoL among patients with MS. Previous research evidence shows that fatigue associated with MS is related to a decrease in the QoL of these patients. The findings of this research are in accordance with the results of previous studies as there is a significant relationship with the aspects of QoL and the factor of fatigue. This study shows that fatigue has a considerable impact on the QoL in MS patients, their physical and mental health. Previous studies that explored the relationship between fatigue, pain self-efficacy and QoL in MS patients showed that fatigue has a significant negative impact on the QoL of these patients. This study confirms these findings and adds to the existing literature by providing a deeper understanding of the factors contributing to the QoL of MS patients.

Table 1. Demographic characteristics of patients (N=85, SD=Standard Deviation)

<table>
<thead>
<tr>
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<th>M</th>
<th>SD</th>
<th>Minimum</th>
<th>Maximum</th>
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<td>Gender</td>
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<td>19</td>
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<td>12.9</td>
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<tr>
<td>Unmarried (live with a partner)</td>
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<td>18.8</td>
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<tr>
<td>Unmarried (live with parents)</td>
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<td>12.9</td>
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<tr>
<td>Married (no children)</td>
<td>8</td>
<td>9.4</td>
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<tr>
<td>Married (with children)</td>
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<td>45.9</td>
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<td>Educational level</td>
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<td>Full-time</td>
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<td>Retired</td>
<td>21</td>
<td>24.7</td>
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Table 1. Demographic characteristics of patients (N=85, SD=Standard Deviation)

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<th>Variables</th>
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<th>5</th>
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<td>Function</td>
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<td>Interpersonal</td>
<td>0.11</td>
<td>0.04</td>
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<tr>
<td>Well-being</td>
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<td>-0.05</td>
<td>0.60a</td>
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<td>Transcendent</td>
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<td>-0.03</td>
<td>0.64a</td>
<td>0.76a</td>
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<td>Pain Self-Efficacy</td>
<td>0.06</td>
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<td>0.50a</td>
<td>0.51a</td>
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<td>Fatigue (Total Score)</td>
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<td>-0.27a</td>
<td>0.03</td>
<td>0.05</td>
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<td>0.02</td>
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<td>Mental Fatigue</td>
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<td>-0.29a</td>
<td>-0.14</td>
<td>-0.08</td>
<td>-0.05</td>
<td>-0.01</td>
<td>0.76a</td>
<td></td>
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<tr>
<td>Physical Fatigue</td>
<td>0.07</td>
<td>-0.19</td>
<td>0.06</td>
<td>0.11</td>
<td>0.04</td>
<td>-0.00</td>
<td>0.87a</td>
<td>0.44a</td>
</tr>
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Table 3. Intercorrelations for all variables- Spearman’s rho. ap<0.05, bp<0.01
Fatigue is a symptom that has a significant effect on the daily lives of patients suffering from MS. Additional research in the direction of measurement and pathogenesis of fatigue will hopefully lead to improved therapies. Pain in MS has to be taken into serious consideration in every MS patient and adapted treatments strategies must be prescribed. Health professionals should point to increasing the patient’s perceived social support and QoL, advising the patient’s family and, also, increase the patient’s self-efficacy levels. This communication leads to a strong health professional-patient relationship with better QoL and better health outcomes.

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