



# The assessment of the perceived stress and the quality of life in the patients with myasthenia gravis: The mediating role of the psychological capital and social support

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## Keywords

Myasthenia Gravis; Social Support; Quality of Life; Iran

## Abstract

**Background:** Stress has been known as a risk factor for the onset and modification of autoimmune disorders such as myasthenia gravis (MG). However, the patients can control their stress and improve their quality of life (QOL) using some factors such as psychological and social support. Psychological capital and social support play a key role in decreasing stress and improving QOL in the patients with MG. Therefore, the present study aimed to assess the mediator role of the psychological capital and social support in perceived stress and QOL of the patients with MG.

**Methods:** In the present cross-sectional study, 203 patients with MG, including 138 women and 65 men, were selected from Iran Myasthenia Gravis Association and Shariati Hospital, Tehran City, Iran, using available sampling. The selected patients completed the Myasthenia Gravis Quality of Life questionnaire (MG-QOL), Luthans Psychological Capital Questionnaire (PCQ), Multidimensional Scale of Perceived Social Support (MSPSS), and Cohen Perceived Stress Scale (PSS-14).

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To assess the mediator role of the psychological capital and the perceived social support in the relationship with the perceived stress and QOL of the patients with MG, structural equation modeling (SEM) was used.

**Results:** There was a significant negative relationship between the perceived stress and the variables of psychological capital (including hope, resilience, optimism, and self-efficacy), perceived social support dimensions (including support from important people, support from family, and support from friends), and QOL dimensions (including social activity and mental health) ( $P < 0.01$ ). The results also showed that the perceived social support dimensions (including support from important people, support from family, and support from friends) and the variables of psychological capital (including hope, resilience, optimism, and self-efficacy) had a significant positive relationship with the QOL in patients with MG ( $P < 0.01$ ). The indirect effect of perceived stress on the QOL through social support and psychological capital was 0.16 and 0.15, respectively, which was statistically significant ( $P < 0.05$ ).

**Conclusion:** The present study results show that a part of the shared variance between the conceptual circles of the perceived stress and QOL in patients with MG results from variability in the psychological capital and social support.

## Introduction

Myasthenia gravis (MG) is an autoimmune disease that occurs due to the immune system's activity against acetylcholine receptors at neuromuscular synapses. MG manifests as weakness and fatigue in the ocular, facial, throat, larynx, limbs, and other body muscles.<sup>1</sup> MG is a chronic disease with relapse-remission periods, and it is divided into two types, ocular and generalized.<sup>2,3</sup>

Perceived stress is the perception of the individual from the stressful situation.<sup>4-6</sup> Some researchers believe that the interpretation of the individuals from the stressful situation is more important than the situation itself, and it determines our stress reaction.<sup>7,8</sup> MG affects the patients' quality of life (QOL) significantly.<sup>9-14</sup> The studies have shown that stress in patients with MG has a negative effect on their QOL, and stress and depression affect the mental and social compatibility of the patients with physical diseases.<sup>15,16</sup>

Many factors can affect the QOL. One of the most important factors that affect the QOL of the patients is stress. Many patients experience different psychological problems during their

illness, and stress is one of the most common types of these problems.<sup>7,17</sup> Many studies have shown a negative relationship between the QOL and the severity of the disease in patients with MG; stress decreases the QOL, which increases stressful experiences.<sup>9-11,13,14</sup>

One of the conceptual structures in psychology is the psychological capital which has four features: optimism, self-efficacy, hope, and resilience.<sup>18-20</sup> Chronic diseases can be traumatic experiences for individuals, lead to stress, and affect the QOL. Many patients appropriately adapt to their condition. Positive psychological features such as psychological capital can play an important role in stress management and QOL.<sup>17</sup> Another factor that affects the psychological health and QOL of patients with chronic diseases is social support. Social support can affect the relationship between the perceived stress and QOL. Social networks such as family, friends, and colleagues make important protection against the psychological challenges related to stressful experiences. Individuals who receive more social support can deal with stress and adjust emotions more effectively.<sup>17</sup> Patients with MG may need to abandon their job; they may get fired due to absence from work or retire early. They also may feel depressed or experience low self-confidence due to their physical characteristics. As a result, they may detach themselves from family, friends, and social environment and deprived of the support system. Organized support for these patients may be helpful.<sup>21</sup> Many studies showed that social support, directly and indirectly, affected the QOL.<sup>2,15,22,23</sup>

The current study evaluates how psychological capital and social support impact perceived stress and QOL in patients with MG. In fact, in this study, psychological capital and social support are considered mediators or efficient factors for the patients with MG. Patients who suffer stress due to their illness, and have higher hope, resilience, optimism, and self-efficacy and feel that appropriate support systems experience less stress. These patients will have different perceptions from the stressful situation, which will affect their QOL.

## Materials and Methods

**Participants:** The present research was a cross-sectional study, and its statistical method was structural equation modeling (SEM). The statistical population was all the MG patients of Iran. After the approval of the initial research plan,

it was approved by the Research Ethics Committee of Shahid Beheshti University, Tehran, Iran, with the ethics code of IR.SBU.REC.1398.028. Iranian MG Association and Shariati Hospital in Tehran City cooperated in the administration of this study. The statistical sample of this study consisted of 213 patients. 10 questionnaires were eliminated based on the exclusion criteria. Finally, 203 questionnaires were analyzed. The statistical sample was selected from the patients with MG recorded in the MG Association and the patients with MG referred to Tehran Shariati Hospital from November 2019 to April 2020 using available sampling.

**Procedure:** Most of the participants in this study were selected from the patients with MG in the Iranian MG Association, and some of them were selected from among the patients with MG referred to Tehran Shariati Hospital. Consent was obtained from the participants. The MG Association members filled the online questionnaire. There was a consent statement at the beginning of this questionnaire, and the participant had to click on the confirm button and continue to access the questions. The consent forms were collected from the rest of the participants who participated in person. Inclusion criteria were: age range from 18 to 65, diagnosis of MG with confirmation of the MG Association and using related medical services at the time of the study, literacy, and accessibility to the Internet for the online participants. Exclusion criteria were: severe symptoms that interfere with completing the questionnaire, other disabling physical and psychological conditions.

**Measures:** Personal information questionnaire had two parts; the first part included the demographic data (age, sex, marital status, and employment status), and the second part included data of the disease (type of MG, duration of the disease, and the number of hospitalization). Myasthenia Gravis Activities of Daily Living (MG-ADL) was used for more specific analysis. MG-ADL consists of eight questions to assess the severity of MG symptoms with scores ranging from 0 to 24; higher scores show more severe symptoms.<sup>24</sup> Myasthenia Gravis Quality of Life questionnaire (MG-QOL15) is a questionnaire with 15 questions designed to assess the physical and psychological aspects of the QOL of patients with MG.<sup>25,26</sup> The variables were analyzed using varimax rotation, and the results showed that the factor structure of the QOL questionnaire included social activity and mental health. The internal consistency coefficient of social activity and mental

health were 0.93 and 0.86, respectively. Psychological Capital Questionnaire (PCQ) consisted of 24 multiple choice questions and four subscales of hope, resilience, optimism, and self-efficacy,<sup>27</sup> with an internal consistency coefficient of 0.88, 0.89, 0.90, and 0.91, respectively. Multidimensional Scale of Perceived Social Support (MSPSS) has 12 items to assess the social support perception from family, society, and friends.<sup>28</sup> The studies have reported Cronbach's alpha of the subscales 0.86 and 0.90, and 0.86 for the whole scale.<sup>29,30</sup> The Perceived Stress Scale (PSS-14) evaluates an individual's general perceived stress over the last month. It measures a person's thoughts and feelings about stressful circumstances and their abilities to manage, overcome, and deal with mental stresses. The major version of this ranking includes 14 inquiries, with a 5-point Likert scale for scoring from "never" to "most of the time" (0-4).<sup>5</sup> In this study, the internal consistency coefficient of the perceived stress was 0.89.

## Results

Among 203 participants in this study, 138 participants were women (68%), and 65 were men (32%). Most participants (89 individuals, 43.8%) had an age range from 35 to 44. The least number of the participants (17 individuals, 8.4%) were 18 to 24 years old. Sixty-five participants (32.0%) were single, 122 participants (60.0%) were married, 11 participants (5.4%) were divorced, and 5 participants (2.5%) were widowed. Sixty-six participants (32.5%) were employed, and 137 participants (67.5%) were unemployed. The average duration of illness of the participants was  $7.31 \pm 6.80$  years (ranging from 1 to 26), and the average number of hospitalizations was  $2.67 \pm 3.40$  (ranging from 0 to 30). Finally, the mean score of the participants in the MG-ADL form was  $5.35 \pm 3.67$  (Table 1).

Table 2 shows the mean and standard deviation (SD) of the main variables of the study, including perceived stress, perceived social support, psychological capital, and QOL.

Table 3 shows that the correlation between perceived stress and perceived social support dimensions (support from important individuals, support from family, and support from friends), psychological capital aspects (hope, resilience, optimism, and self-efficacy), and QOL dimensions (social activity and mental health) was significantly negative.

**Table 1.** Demographic information of the study subjects

Variable	Value	
Age (year) [n (%)]	18-24	17 (8.4)
	25-34	34 (16.7)
	35-44	89 (43.8)
	45-54	45 (22.2)
	55-65	18 (8.9)
Gender [n (%)]	Men	65 (32.0)
	Women	138 (68.0)
Marital status [n (%)]	Single	65 (32.0)
	Married	122 (60.0)
	Divorced	11 (5.4)
	Widow	5 (2.5)
Employment status	Employed	66 (32.5)
	Unemployed	137 (67.5)
Duration of disease (year) (mean ± SD)	7.31 ± 6.80	
Number of hospitalization (mean ± SD)	2.67 ± 3.40	
MG-ADL total score (mean ± SD)	5.35 ± 3.67	

MG-ADL: Myasthenia Gravis Activities of Daily Living; SD: Standard deviation

The results also showed a significant and positive relationship between social support dimensions and psychological capital with the QOL of the patients.

**Table 2.** Mean and standard deviation (SD) of the main variables of the study

Variables	Mean ± SD
Perceived stress	30.12 ± 7.18
Perceived social support	
Support from important individuals	14.16 ± 3.72
Support from family	13.77 ± 4.02
Support from friends	12.25 ± 4.10
Psychological capital	
Hope	16.51 ± 5.87
Resilience	16.19 ± 4.78
Optimism	17.63 ± 4.40
Self-efficacy	18.47 ± 5.94
Quality of life	
Social activity	17.73 ± 6.31
Mental health	4.96 ± 4.27

SD: Standard deviation

The model fit indices of the partial mediator role of psychological capital and perceived social support in the relationship between the perceived stress and QOL of patients with MG, including chi-square index ( $\chi^2$ ), chi-square index over the degree of freedom ( $\chi^2/df$ ), Comparative Fit Index (CFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Root Mean Square Error of Approximation (RMSEA), were 80.77, 2.60, 0.96, 0.94, 0.91, and 0.069, respectively.

Figure 1 shows the model of the mediator role of psychological capital and perceived social support in the relationship between the perceived stress and QOL of patients with MG. In this model, 34% of the score dispersion of the perceived social support and 37% of the score dispersion of the psychological capital was predicted by the perceived stress. Finally, 32% of the score dispersion of the QOL was described by the perceived stress, perceived social support, and psychological capital.

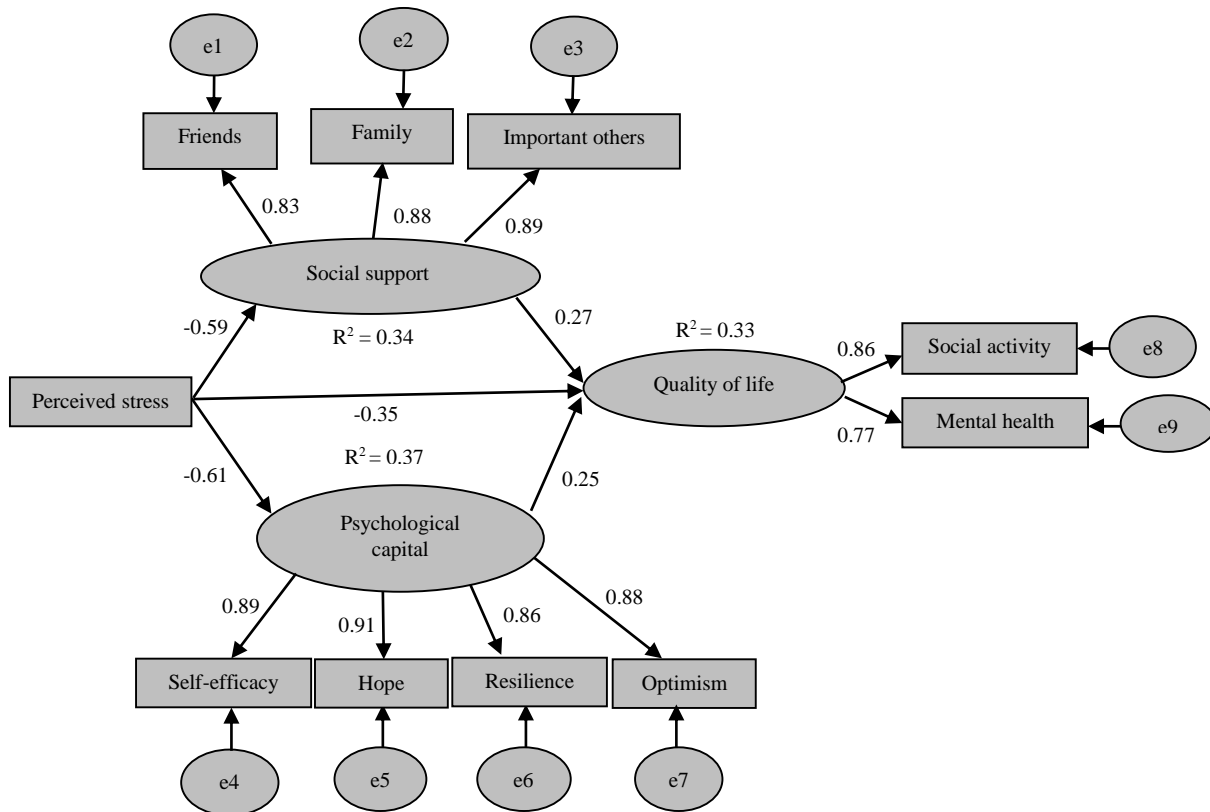
The results also showed that all the coefficients between the variables (psychological capital, perceived social support, perceived stress, and QOL of patients with MG) were statistically significant. In this model, the relationship between the perceived stress and perceived social support and the relationship between the psychological capital and QOL were negative and significant. Furthermore, the relationship between psychological capital and perceived social support was negative and significant (Figure 1).

Bootstrapping was used to determine the statistical significance of the indirect effect of the perceived stress on the QOL by psychological capital and perceived social support. The results were 0.15 for the psychological capital and 0.16 for the perceived social support, which were statistically significant ( $P < 0.05$ ).

**Table 3.** Correlation matrix of the variables of the study

	1	2	3	4	5	6	7	8	9
1. Perceived stress	1								
2. Important individuals	-48.0*	1							
3. Family	-44.0*	60.0*	1						
4. Friends	-38.0*	48.0*	55.0*	1					
5. Self-efficacy	-56.0*	47.0*	43.0*	40.0*	1				
6. Hope	-60.0*	49.0*	45.0*	41.0*	81.0*	1			
7. Resilience	-45.0*	42.0*	37.0*	40.0*	72.0*	79.0*	1		
8. Optimism	-41.0*	34.0*	39.0*	37.0*	72.0*	75.0*	72.0*	1	
9. Social activity	-60.0*	40.0*	40.0*	27.0*	47.0*	47.0*	38.0*	29.0*	1
10. Mental health	-32.0*	23.0*	20.0*	20.0*	23.0*	21.0*	21.0*	20.0*	72.0*

\* $P < 0.01$



**Figure 1.** Model of the mediator role of psychological capital and perceived social support in the relationship between the perceived stress and quality of life (QOL) of patients with myasthenia gravis (MG)

**Discussion**

In the present study, the perceived stress, psychological capital (hope, resilience, optimism, and self-efficacy), and QOL of the patients with MG were significant. It means that psychological capital has a partial mediator role in the relationship between the perceived stress and QOL of patients with MG. Psychological capital and its variables (hope, resilience, optimism, and self-efficacy) increase the QOL of the patients with MG by reducing the perceived stress.

There is a negative relationship between perceived stress and the variables of psychological capital.<sup>31,32</sup> It means that people with such abilities can cope more appropriately with a stressful situation and have a better QOL.<sup>33</sup> Although living with a chronic disease can be very stressful for the patient, some studies showed that many patients could cope with their condition and its challenges and manage their problems.<sup>17</sup> The present study also suggests that obtaining positive psychological features such as psychological capital variables can manage stress and improve the QOL.

Based on the Bandura psychosocial theory, the patients who believe in their ability to deal with stress (self-efficacy) are more likely to control the

challenging and stressful situations and less likely to select passive coping strategies.<sup>34</sup> Therefore, they deal more appropriately with their stress and use their internal powers to face stressful situations.<sup>35</sup> When an individual has high self-efficacy, they are hopeful of achieving their goals. Hopeful individuals test different paths to achieve their goals, and they believe in their path while facing any challenges.<sup>36</sup> Therefore, hope is an important variable for patients with MG. When the patient tests different therapeutic methods to get well positively reduces stress and increases the QOL. Optimism is very similar to hope. Seligman et al. pointed that optimism depended on the explanation and insight of the individuals to the events.<sup>37</sup> A hopeful person who believes in their abilities and has high self-efficacy is optimistic about the treatment results. If patients with MG have high levels of hope and optimism, they can deal with the stress they face in the recurrence periods, experience a better QOL, and improve their mental health and social activity. Optimistic individuals do not feel negative toward failure, and they believe that stressful situations are not permanent.<sup>37</sup> Resilience helps the individual to restructure themselves while facing stress.<sup>38</sup>



Resilient patients with MG do not trap in the stress cycle leading to worsening symptoms and lowering the QOL. They can stay flexible and positively cope with different situations. As stated by Margolis and Stoltz, resilient people can quickly and efficiently respond to the stressful situations.<sup>39</sup>

The present study showed a significant relationship between the perceived stress, social support, and QOL of the patients with MG. It means that social support has a partial mediator role in the perceived stress and QOL of the patients with MG. Social support decreases stress and improves the QOL in these patients. Appropriate social support by activating adaptive coping strategies leads to stress reduction.<sup>17</sup> Stress has a negative relationship with the QOL. Therefore, social support can lead to the improvement of the QOL. In contrast, those who receive poor social support do not use adaptive coping strategies while facing challenges, leading to stress increase, a lack of efficiency in dealing with challenging situations, and low QOL. Many studies have shown that social support affects emotional distress, health, and QOL.<sup>40,41</sup>

Some studies found that the MG symptoms and outcomes such as facial manifestations and ptosis led to poor social support for the patients, which can cause social distancing of the patient. The patients may also lose their job due to treatment sessions. Therefore, MG can cause social distancing of the patients, and society may also abandon them due to their lack of efficiency. These factors cause social support deprivation and decrease the QOL of the patients.<sup>21</sup>

As the present study showed, a supportive environment could empower the patients with MG to deal with the stress appropriately. A non-supportive environment increases their stress

and decreases their QOL.<sup>42</sup> Cordova et al. reported that patients with less social support had a lower QOL.<sup>43</sup> The type of support that helps the patients to deal with stress more adaptively requires further research. It seems that patients with MG are dealing with uncertainty, and they do not have enough information about the treatment process and their condition. Therefore, informational support can significantly reduce their stress. Emotional, health, and medical support provided by the acquaintances and health system is also very effective.

### Conclusion

One of the main goals of chronic disease treatment such as MG is improving life and mental health. Therefore, in addition to focusing on the physical symptoms of the disease, it is suggested that the psychological dimensions and resources for the improvement of the QOL be taken into consideration. As mentioned previously, the health system only focuses on the physical symptoms and ignores the psychological factors that affect the QOL. Thus, based on the findings of this study, health specialists can improve the QOL of the patients and reduce their stress by considering the psychological factors and informing their family and acquaintances.

### Conflict of Interests

The authors declare no conflict of interest in this study.

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