

Investigation of Physical and Mental Fatigue and Quality of Life in People with Musculoskeletal Problems

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Abstract

Musculoskeletal disorders include a wide range of diseases that affect the skeletal and muscular systems, which tolerate women and men of all ages, all over the globe and they are found in all social and demographic stratifications. The purpose of this study is to investigate the quality of life and the feeling of fatigue of these patients, as well as the burden or not on the quality of life, from the years of diagnosis. The present study involved 100 patients aged 45 to 55 years old, with musculoskeletal problems, who were diagnosed with the problem for at least one year. Most of the sample were women, high school graduates, and married. The present thesis is a quantitative synchronous study, in which two research tools were used: a) the Greek version of the "Fatigue Assessment Scale (FAS)" which contains a total of 10 questions and measures fatigue and b) the Greek version of the Missoula-Vitas Quality of questionnaire Life Index-15 known as "MVQOLI-15R" which consists of 15 questions and measures the quality of life of patients. The results of the present research confirmed the first initial hypothesis, which correlates fatigue with the years of diagnosis of the disease and the quality of life of patients. More specifically, the higher the overall quality of life of patients, the lower their level of physical, mental and overall fatigue. The second research hypothesis is partially only verified, since only fatigue is affected by the years that have passed from the first day of diagnosis, and not the overall score of the quality of life. The results showed the need to develop and implement appropriate programs to prevent and address the problems due to musculoskeletal disorders in terms of fatigue and quality of life. Further research could also focus on the relationship between the mental state of patients with musculoskeletal problems and quality of life.

Keywords: Musculoskeletal Disorders, Fatigue, Quality Of Life, Years Of Diagnosis, And Quality Of Life.

Introduction

In people suffering from musculoskeletal problems, in addition to pain, fatigue is a common symptom, which is directly related to the years of diagnosis and negatively affects the quality of life. Epidemiological studies have documented a close relationship between the occurrence of fatigue, quality of life, and musculoskeletal diseases, but also a relationship between the way these problems are treated and the cognitive level and demographic data of the population (i.e. whether the sufferers come from rural or urban areas) [1, 2].

Specifically, a study by Tuzun (2007) investigated the relationship between the management of pain and fatigue due to musculoskeletal problems, with the level and manner of information on health issues and dealing with these problems in urban and rural communities. In his review, the scientist observed that chronic musculoskeletal pain is often accompanied by a feeling of fatigue and has serious negative effects on the emotional state, active social

activity, work and, by extension, the quality of life of the sufferers. The key to managing the negative effects is, according to Tuzun (2007), information, the timely and substantial treatment of problems from a medical-nursing point of view, the removal of obstacles that are a brake on the active social participation of sufferers and the emotional strengthening of their family with the aim of their return to work and active activity [1].

The prevention of musculoskeletal problems is also very important. Especially in children, who are in a phase of physical changes and have not yet formed their physique, the correct body posture, the ergonomics in terms of lifting and carrying weights (mainly the school bag that is carried on an almost daily basis by the children who go to school and has a significantly heavy load on them) and related education can prevent the occurrence of musculoskeletal problems such as scoliosis, lordosis, shoulder and back pain, back pain, etc., associated with a chronic lethargy, fatigue and weakness [3].

Research by Priftis et al. (2007) documented the effect of the environment in which children with severe health problems live and grow up. Specifically, the research was conducted among 478 school-aged children (8-10 years old) living in the suburbs of Athens and 342 children living in rural areas. The researchers measured any respiratory problems (occurrence of asthma, diagnosed cystic fibrosis, history of chronic lung disease, etc.) and musculoskeletal problems (primary dyskinesia, musculoskeletal abnormalities, etc.) of the children who lived in the city and compared them with the children who lived in the province. The researchers concluded that living in the countryside and exposing children to nature as well as working with animals (e.g. care in a livestock unit) is a protective shield for respiratory as well as musculoskeletal problems. Fresh air, movement, physical contact with animals and agricultural pursuits contribute not only to physical health but also to mental upliftment, especially in childhood when the foundations for physical, cognitive and emotional development are laid [2].

Fatigue due to musculoskeletal problems is aggravated by the type of work, its duration and lifestyle (lack of sleep, flexible working hours, physical and psychological stress, standing, lack of exercise, ergonomic posture, etc.). Research by Harma et al. (1988) among female health professionals documented a close relationship between the occurrence of low back pain, fatigue and their type of work. In particular, lifting weights, rotating working hours, disturbed circadian rhythm and psychological pressure due to the type of work carry risks for the occurrence of musculoskeletal problems and mainly back pain, which manifests itself with a feeling of fatigue and pain [4].

For the prevention and treatment of musculoskeletal problems and the feeling of fatigue, physical exercise was used as a compensatory factor, which has been shown to help with better body posture while performing tasks, better oxygen intake, reducing the feeling of fatigue and strengthening the muscles that prevent the occurrence of musculoskeletal problems [4].

Also, a recent study among health professionals recorded a close relationship of fatigue with the quality of life and with their health. In fact, in the research, nurses scored lower than doctors regarding their energy and psychosocial health. The feelings of fatigue and burnout experienced by nurses due to their profession had negative effects on their physical and mental health and, by extension, on their quality of life [5].

The relationship of fatigue originating from musculoskeletal problems, with the quality of life and the time interval of diagnosis, is strongly perceived in those suffering from neurological diseases such as Parkinson's or Multiple Sclerosis. These diseases, which are chronic, degenerative and their course is basically irreversible, are characterized by an accumulation of damage due to nerve demyelination and repeated relapses, manifested among other things by problems in the muscular and proprioceptive system (hand movement, walking, support, posture) that can reach complete inability to walk and/or self-care [6, 7].

The effort, in these cases, for voluntary muscle movement aggravates the already existing muscle problem and causes severe fatigue. Especially in Parkinson's, bradykinesia, rigidity, gait disturbances (shuffling gait, absence of swinging of the upper limbs during walking, appearance of tremors, etc.) burden the already strained muscular system and the patients show severe fatigue, which becomes more intense over time of the years of the condition [8].

Fatigue combined with the inability to move and self-care has a negative impact on their quality of life and often these patients, in addition to their physical problems, experience intense depression that can even lead to suicide. Research by Kostic et al. (2010) among Parkinson's patients recorded suicidal tendencies increased by 5.3% more than expected as well as strong symptoms of depression, anxiety and hopelessness. Research by Rickards (2005), who examined not only Parkinsonian patients but also patients with Multiple Sclerosis as well as patients who suffered a stroke, reached similar conclusions, as all these conditions affect movement and self-care and create a feeling of fatigue which with her series triggers feelings of depression and hopelessness [9, 10].

As the fatigue in those suffering from musculoskeletal problems is particularly intense and worsens their already burdened physical and often mental state, efforts are being made to help patients with the assistance of technology to reduce the burden on their musculoskeletal system and facilitate walking and by extension the fatigue. By discovering case-specific technological equipment, using simulators and studies on improving muscle support and activation, modern scientists are trying to reduce fatigue, improve movement and help patients in their daily lives.

One such attempt was made by Alonso et al. (2012) who quantified the contribution of the nervous system, muscles and joint torques applied during walking to creating and/or coping with the problems presented by patients with incomplete spinal cord injuries. Accurately identifying the difficulty in supportability and with the help of a simulator, they attempted to construct artificial limbs, which were applied to the ankles, knees and hips, to activate the Central Nervous System (CNS) and by extension the muscles to can these individuals move [11].

The purpose of the research was to investigate the quality of life and the feeling of fatigue of patients with musculoskeletal problems, as well as the burden or not on their quality of life, since the years of diagnosis. The above is summarized through the research hypotheses, which are as follows: • There is a negative correlation between fatigue and quality of life in these patients. • The years of diagnosis will have a negative effect on fatigue and quality of life in these patients.

Method

Research design

This is a quantitative cross-sectional study, in terms of the effects that musculoskeletal problems have on the lives of patients. In par-

ticular, the researched variables are three: quality of life, fatigue as well as the years of diagnosis of the disease.

Sample

A total of 100 patients with musculoskeletal problems participated in the research. Entry criteria for the patients were a diagnosis of musculoskeletal problems for at least one year, age - the participants had to be over 18 years of age - the existence of a good level of communication as well as the absence of a diagnosed serious mental illness. In more detail, the majority of the respondents are women, aged between 45 and 55 years at a rate of 74%, and are high school graduates. Also, the largest percentage of patients (75%) are married and employed in the public sector and their musculoskeletal problems have been diagnosed in 60% from 1-10 years.

Questionnaires

In the present research, the main object of study was the quality of life and the feeling of fatigue of patients with musculoskeletal problems. For this purpose, a 3-section questionnaire was used that includes patients' demographics, fatigue, and quality of life. For the fatigue research, the Greek version of the "Fatigue Assessment Scale (FAS)" was used and contains a total of 10 questions. This scale, unlike other scales that measure fatigue, such as FSS (Fatigue Severity Scale) and MFI (Multidimensional Fatigue Inventory), treats fatigue as a single subject of study and does not divide it into domains. Nevertheless, its users, to be sure that they have evaluated all areas of fatigue, answer questions concerning both physical and mental symptoms [12]. Also, the third and last section is the Greek version of the Missoula-VitasQualityofLifeIndex-15 questionnaire known as "MVQOLI-15R" which consists of 15 closed questions in total. The MVQOLI-15R questionnaire in its Greek version includes 15 questions out of the 25 in the English original, it has been translated and adapted for Greek data by Dr. Paraskevi Theofilou and is a reliable and valid tool for assessing the quality of life of sufferers which has been used in the context of the study of many different types of health problems and care of sufferers (see also Theofilou et al., 2012:290) [13]. The five areas that are examined are the subjective image that each respondent has of his quality of life, his symptoms, his functionality, his relationships with his close and wider social environment (his interpersonal relationships), well-being but also his spirituality. Specifically, for spirituality, higher scores represent greater spiritual well-being while the total sum of all responses provides information on general spiritual well-being. The questions are general and a five-point scale (Likert) is used for the answers, where the least desirable situation receives the lowest score and vice versa. One would say that the measurement of spirituality is not directly related to the quality of life. However, the truth is that the control of mental well-being is a very important parameter in the overall picture that everyone has of their quality of life, as it can affect their attitudes and moods positively and/or negatively towards their problem and by extension to affect favorably or unfavorably the progression of his illness (see also Theofilou et al., 2012:290) [13].

Procedure

Questionnaires were distributed to participants via the internet due to the Covid-19 pandemic, using an appropriate Google form. In the context of the participants' right to full transparency, the researcher informed the participants about the nature and purpose of the research. In addition, appropriate instructions were given for completing the questionnaires, the time required for completion, as well as for maintaining the anonymity of the participants. Participation in the research was voluntary.

Data analysis

The statistical program SPSS was used for the analysis of the data.25 More specifically, for the analysis of the questions of the questionnaires, percentages, standard means and standard deviations were used in the descriptive statistics. In addition, tables and graphs were used for the appropriate presentation of the results. In inductive statistics, the non-linear Pearson coefficient was used to highlight statistically significant correlations.

Results

In this section, the demographic characteristics of the patients who participated in the study are presented. In Table 1, the gender of the patients is shown. More specifically, 74% are women and the remaining 26% are men.

Table 1: Gender of Research Participants

		Gender		
		Frequency	ValidPercent	CumulativePercent
Valid	Male	26	26,0	26,0
	Female	74	74,0	100,0
	Total	100	100,0	

In Table 2, the age of the respondents is listed. 48% of the sample is between 45 and 55 years old and 24% is between 55 and 65 years old. Still, 16% of patients are under 45 years old, while the remaining 12% are over 65 years old.

Table 2: Age of Survey Participants

		Age		
		Frequency	ValidPercent	CumulativePercent
Valid	<45 years	16	16,0	16,0
	45-55	48	48,0	64,0
	56-65	24	24,0	88,0
	>65 years	12	12,0	100,0
	Total	100	100,0	

In Table 3, the educational level of the respondents is listed.30% of the respondents have graduated from secondary School, 25% have studied at University, 23% have postgraduate studies, 13% of the sample consists of High School graduates and only 9% is occupied by Primary School graduates.

Table 3: Educational Level of The Research Participants

Educational level				
		Frequency	ValidPercent	CumulativePercent
Valid	Primary	9	9,0	9,0
	High school	13	13,0	22,0
	Secondary	30	30,0	52,0
	University	25	25,0	77,0
	Master	23	23,0	100,0
	Total	100	100,0	

In Table 4, the marital status of the patients is listed. As can be seen, 75% of the respondents are married and 10% are widowed. Also, 8% of respondents declare themselves single and 7% are divorced.

Table 4: Marital status

		Frequency	ValidPercent	CumulativePercent
Valid	Single	8	8,0	8,0
	Married	75	75,0	83,0
	Divorced	7	7,0	90,0
	Widowed	10	10,0	100,0
	Total	100	100,0	

In Table 5 below, the professional employment of the patients is presented. 38% of the participants are public employees, 21% are private employees and 17% of respondents are retired. Furthermore, 12% of the participants are self-employed, 11% are employed in household chores, while only 1% of the respondents are students.

Table 5: Professional Employment of Survey Participants

		Frequency	ValidPercent	CumulativePercent
Valid	Private employee	21	21,0	21,0
	Public servant	38	38,0	59,0
	Freelancer	12	12,0	71,0
	Housewife	11	11,0	82,0
	Pensioner	17	17,0	99,0
	Student	1	1,0	100,0
	Total	100	100,0	

In Table 6, the time elapsed since the respondents were diagnosed with a musculoskeletal problem is listed. 60% of patients claim that they were diagnosed with musculoskeletal problems 1 to 10 years ago, 26% between 11 and 20 years ago, while 14% of patients more than 20 years have passed since their diagnosis.

Table 6: Years Since Diagnosis of The Musculoskeletal Problem of The Research Participants

		Frequency	ValidPercent	CumulativePercent
Valid	1-10	60	60,0	60,0
	11-20	26	26,0	86,0
	>20	14	14,0	100,0
	Total	100	100,0	

In Table 7, the correlation coefficient values of the statistical tests carried out are presented, from which 13 statistically significant correlations emerged. More specifically, as the patient's physical, mental, and overall fatigue increases, their global quality of life, the "Symptoms" variable, and the overall quality of life score decrease. In addition, the increase in mental fatigue and overall fatigue experienced by patients is identified with a decrease in the variable "Interpersonal relationships", while it is clear that the higher the physical and overall fatigue of patients, the lower the level of the variable "Spirituality". The above correlations range from 0.219 to 0.465, so they are characterized as low to moderate intensity. However, they are statistically significant at the 95% or 99% confidence level. The above also verify the first part of the first research hypothesis.

Table 7: Correlations of Fatigue and Quality of Life of Research Participants

	Physical fatigue	Mental fatigue	Total fatigue
Overall QOL	-.432**	-.341**	-.465**
Symptoms	-.402**	-.277**	-.409**
Function	0.127	0.145	0.163
Interpersonal relations	-0.174	-.305**	-.285**
Wellbeing	-0.137	-0.067	-0.123
Spirituality	-.219*	-0.188	-.245*
Total score	-.290**	-.259**	-.330**
**. Correlation is significant at the 0.01 level (2-tailed).			
*. Correlation is significant at the 0.05 level (2-tailed).			

In Table 8, the values of the correlation coefficients are listed, from which 4 statistically significant correlations emerged. As can be seen, the earlier the respondents were diagnosed with musculoskeletal problems, the higher the level of the variables "Functionality" and "Well-being", but the higher their level of mental and overall fatigue. The correlations are of low intensity, with values from 0.200 to 0.241, and statistically significant at the 95% confidence level. Therefore, the second research hypothesis can be considered partially verified as the respondents show increased fatigue over the years.

Table 8: Correlations of Years Since Diagnosis with Quality of Life and Fatigue

	Years since diagnosis (musculoskeletal problem)
Overall QOL	-0.103
Symptoms	-0.106
Function	.241*
Interpersonal relations	-0.039
Wellbeing	.200*
Spirituality	0.050
Total score	0.127
Physical fatigue	0.171
Mental fatigue	.205*
Total fatigue	.225*
*. Correlation is significant at the 0.05 level (2-tailed).	
**. Correlation is significant at the 0.01 level (2-tailed).	

Discussion

In the above research, the quality of life and fatigue of patients with musculoskeletal problems were investigated. More specifically, a total of 100 patients participated in the research, most of them women, from 45 to 55 years old, high school graduates, and married. Furthermore, the majority of the sample consists of civil servants who were diagnosed with musculoskeletal problems between 1 and 10 years ago.

The fact that the original hypothesis was confirmed, which correlates fatigue with the years of diagnosis of the disease and with the quality of life of the sufferers (the higher the global quality of life of the patients and the total score of their quality of life, the lower the level of physical, mental and overall fatigue), is also explained by what has been supported in the literature on the relationship between fatigue and quality of life. Of course, it is impossible, due to the variety of musculoskeletal problems and the existence of frequent co-morbidities as well as the temperament of each patient, to consider that fatigue has the same impact physically and psychologically on all patients. However, it is generally accepted that fatigue due to these problems seriously affects the quality of life of the sufferers, especially the chronically ill. Research by Janardhan & Bakshi (2002) among people with multiple sclerosis records a close relationship between quality of life, physical fatigue, and the appearance of melancholy that can reach depression [14]. Multiple sclerosis is a chronic, degenerative disease with musculoskeletal and other problems, originating from the demyelination of the nerves, which affects the movement but also the psychology of the patients resulting in a low quality of life. According to the scientists, if the fatigue combined with the psychological strengthening of the sufferers are treated in time and separately from the progression of the disease itself, then there is a clear improvement in the image of the sufferers, in terms of their quality of life. Research also by Schmeding & Schneider (2013) in patients with Systemic Lupus Erythematosus (SLE), a rarer autoimmune chronic disease than multiple sclerosis but with equally

intense symptoms of fatigue, concluded from the corresponding results [15]. The intense fatigue experienced by patients with SLE, especially during periods of disease exacerbation, negatively affects their functionality (movement, daily activities, problems at work, inability even to take care of themselves) and has significant negative effects on their psychology. A large number of patients with SLE present symptoms of Generalized Anxiety Disorder (GAD) and severe Depression and many of them need psychological support in addition to medical/pharmaceutical treatment.

In the present research, the sample was particularly limited, consisting only of patients suffering from musculoskeletal diseases. Another significant limitation was the Covid-19 pandemic, which was an obstacle to direct contact and face-to-face communication with the patients who participated, as well as the conduct of possible oral interviews. Furthermore, the responses of the respondents were purely subjective, so their psychological state at the time they completed the questionnaire could not be validated by the researcher. In addition, it should be emphasized that the demographic data of the research participants were also recorded as well as their educational level in order to study whether and to what extent these data affect the treatment of fatigue as well as their quality of life. However, as the larger sample was high school graduates who lived in an urban area, this case was not adequately investigated. In future research, the sample could be expanded, both in terms of patients' diseases and medical problems, and in terms of geographic context. More specifically, it would be of great interest to compare fatigue and quality of life between different groups of medical problems and between residents of Greece and abroad, or even urban and rural areas. In addition, the psychological state of the patients could also be measured, in order to increase the reliability of their answers, but also the psychological reinforcement from the health professionals as well as the related persons in relation to the stabilization, deterioration, or improvement of their physical condition. It is known that most diseases are psychosomatic and the positive and/or negative treatment of patients towards their condition contributes to the improvement or, on the contrary, to the worsening of their physical problems. Research in this direction can lead to new ways of handling serious physical diseases and the effects on the quality of life of the sufferers. In particular in this area, the relationship between the mental state of people with musculoskeletal problems and quality of life, the COVID-19 pandemic opens a window for further investigation and interdisciplinary intervention. The severity of the disease, the multi-organ failure it often creates, intense fatigue even during speech, pain and musculoskeletal problems combined with isolation and the inability to communicate with loved ones can be an important scientific field of research in this direction [1-70].

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