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THE INFLUENCE OF MIXED ANXIETY-DEPRESSIVE DISORDER ON THE PERCEIVED QUALITY OF LIFE IN MULTIPLE SCLEROSIS PATIENTS

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Abstract: *The subjective perception of quality of life of patients with chronic impairment depends on many influences coming from both mental and physical variables. The patient needs to adapt to new contexts such as loss of social roles, changes in the future plans, insecurity, self-esteem impairment. The aim of this study was to highlight the influence of mental variables over the perception of life quality in patients with multiple sclerosis. In order to acquire the data, we applied the following instruments: The State-Trait Anxiety Inventory (S.T.A.I.), Beck Depression Inventory (B.D.I.), Eysenck's Personality Inventory (E.P.I.), The Medical Outcomes Study 36-Items Short Form Health Survey (SF-36) and The Mini-Mental State Examination (M.M.S.E.). The research was performed on a group of 60 patients, diagnosed with multiple sclerosis. Subjects were informed that participation to the study required filling the test forms (depression, anxiety, emotional stability, cognition, and life quality inventories) and were evaluated individually. The data were statistically analyzed. The study revealed that the mental dimension of the life quality perception could be estimated by a model including depression and anxiety-state cumulated with extraversion and emotional stability, the latter two having a weaker power of prediction. Cognitive variables (orientation, attention, focus, memory and language) didn't prove their prediction significance on perceived quality of life. The study confirmed partially the hypothesis. The small study group and the medium level of disability did not allow us to generalize our conclusions, but the research opened up the perspective for further investigations.*

Key words: *depression, anxiety, multiple sclerosis, quality of life*

1. Introduction

Investigating the perceived quality of life (QoL) in patients suffering from a chronic disorder, the role of psychomental variables (emotional stability, extraversion, depression, anxiety and cognitive functions), as well as the role of

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the demographic variables represents a process based on documentary research and methodological support, best defined by the fact that a chronic disorder has a major impact on both the physical and psychosocial well-being of the patient who has to consider and confront realities as the loss of social role, a radical change of plans for the future, feels insecure, has a poor self-image and self-esteem [2], [10].

The QoL for chronically ill patients can be altered by the long-term or short-term effects of the disease and its associated treatments [13]. The QoL related to the disease is multidimensional and subjective, and it is based on patient's experience and perception on being able to live a fulfilling and meaningful life [11], [15]. Assessment and treatment of depression, anxiety, emotional stability and cognitive functions in patients with a chronic condition associated with somatic symptoms is very important, given the fact that all these symptoms may have an impact on patients' adherence to treatment, and also on the perceived QoL [4], [7], [17].

2. Objective

Establishing the relevance of depression, anxiety, emotional stability and extraversion, as well as that of the cognitive functions in perceived QoL related to health, and the need to improve the standard methods of intervention/treatment in patients with multiple sclerosis.

3. Research Methods and Instruments

In order to collect the data needed to evaluate the QoL in patients diagnosed with multiple sclerosis, and the influence of psychological variables (depression, emotional stability, extraversion and anxiety) [1], [5] on the QoL, we used the following assessment instruments:

- The State-Trait Anxiety Inventory (S.T.A.I.) – that consists of two self-assessment scales for measuring two distinct concepts on anxiety: State anxiety (A- State) and Trait anxiety (A- Trait) [16].
- Beck Depression Inventory (B.D.I.) – a widely used instrument for detecting depression in DSM IV. The instrument consists of 21 items, with the first 15 referring to the cognitive and affective aspects, and the last 6 referring to the somatic aspects.
- Eysenck's Personality Inventory (E.P.I.) – Form A. Extraversion/Introversion and Neuroticism (emotional stability), as alleged independent variables, were measured using the Eysenck questionnaire. The questionnaire contains 57 items, of which 24 measure extroversion, 24 measure neuroticism, and 9 correspond to the sincerity of the answers.
- The Medical Outcomes Study 36-Items Short Form Health Survey (SF-36) – one of the most popular and valid tools for measuring the QoL. It evaluates 8 domains: physical function, physical role, somatic pain, general health, vitality, social function, emotional role and mental health. Interpretation of results can be done dividing it into the physical component and the mental component. Scores range from 0 to 100. The closer the score to 100, the better the patient's assessment in the given domain.
- The Mini-Mental State Examination (M.M.S.E.) – The questionnaire consists of 30 questions designed to assess the capabilities of the subject on orientation, abilities to write and read. The

recommended standards for assessing the severity of the dysfunction are: mild – score > 21, moderate - scores between 10-20, severe score < 9.

Our research was performed on a sample group of 60 subjects. The subjects were inpatients diagnosed with multiple sclerosis. The sample group included 51 women and 9 men. The age of the subjects ranged from 20 to 67, with an average age around 46 years. Subjects originated from both urban and rural areas.

Selection of participants was done on a voluntary basis. All subjects passed through a preliminary evaluation and interviewed in order to build up confidence and diminish the contextual anxiety. Subjects have been informed that participation involved the completion of several written tests.

Each subject was evaluated with the same instruments, and under similar conditions. All subjects were evaluated individually.

The purpose of the study was explained to each subject, as well as the fact that the collected data would remain confidential. All the participants were explained that there were no correct or incorrect answers. All data were statistically analyzed using SPSS 10 programme for regression and prediction models [6], [12].

Hypothesis:

Even when similar symptoms are present, patients diagnosed with a chronic disorder will score differently for their perceived QoL, the difference being explained by the psychological variables: depression, state anxiety, trait anxiety, extraversion and emotional stability.

The above-mentioned hypothesis led us to the rendition of two specific hypotheses:

- the specific hypothesis 1: The physical component for the QoL is encompassed by the level of depression, as well as the state anxiety, trait anxiety, extraversion and emotional stability of the patient.
- the specific hypothesis 2: The mental component of the QoL is encompassed by the level of depression, as well as the state anxiety, trait anxiety, extraversion and emotional stability of the patient.

Different scores on QoL can be predicted by the degree of cognitive dysfunction of the subject: orientation, memory, attention and concentration, language.

Related to these hypotheses, we postulated the following:

- the specific hypothesis 1: The perception of the physical component of the QoL can be predicted by the degree of cognitive dysfunction: orientation, memory, language.
- the specific hypothesis 2: The degree of cognitive dysfunction (orientation, memory, attention, language) is a predictive factor in the perception of QoL - mental component.

4. Results and Discussions

The physical component of the QoL is predicted by the level of depression, as well as state anxiety, trait anxiety, extraversion and emotional stability of the subject.

Assuming that there are differences in how the variables taken into account have an impact on the physical component of the QoL of patients, a linear regression analysis was performed to show how

these variables contribute to perceiving the physical component of the QL and/or the ratio of these variables in a predictive equation.

The independent variables were: depression, state anxiety, trait anxiety, emotional stability and extraversion, while the dependent variable was the physical component of the QoL (*Table 1*).

Table 1

The physical component of QoL related to the emotional variables

V.i.	R^2 adj	F	p (sig)	β non-standard	β standard	Std. E	t	p (sig)
Depression	0.58	17.50	0.00	- 1.21	- 0.39	0.44	- 2.72	< **0.01**
Anx-trait				- 0.21	- 0.14	0.26	- 0.80	0.42
Anx-state				- 0.48	- 0.30	0.25	- 1.93	**0.05**
Extraversion				0.72	0.12	0.67	1.08	0.28
Stability				0.46	0.08	0.57	0.80	0.42

The prediction equation of the physical component of the QoL in patients with multiple sclerosis included the following components:

- R^2 adjusted was 0.58, meaning that the model explained 58% of the variance of the QL - physical component variable;
- test F values, and the significance coefficients p < 0.01 confirmed that the model was valid;
- for depression, p was < 0.01, meaning that depression was a significant predictor for the QoL - physical component;
- for trait anxiety, p was > 0.05, meaning that trait anxiety was not a significant predictor of the physical component of the QoL, therefore being removed from the model;
- for state anxiety, p was < 0.05, meaning that state anxiety was a significant predictor of the physical component of the QoL;
- for extraversion, p was > 0.05, meaning that extraversion was not a significant predictor of the physical component of the QoL, therefore being removed from the model;
- for the emotional stability, p was > 0.05, meaning that emotional stability was not a significant predictor of the physical component of the QoL, therefore being removed from the model;
- the model's defined constant was 84.10, meaning that the perceived physical component of QoL in the studied subjects started at a value of 84.10 on our 100 pt. scale.

The standardized beta coefficients showed that the depression variable was more important than the state anxiety variable in predicting/determining the

degree of perception on the QL - the physical component.

These results revealed the fact that the degree of perception on the physical component of the QoL depended to a large extent on the degree of depression, and to a lesser extent on the state anxiety of the subjects. The same analysis indicated that the prediction model was not complete, respectively that there were other factors that could influence the QoL - physical component variable.

Qualitative interpretation:

The model that used as predictor variables depression and state anxiety was valid, and explained 58% of the QoL variance. Following this model, one can observe the importance of depression as a predictor of the QoL – physical component, which expresses an explanatory power greater than the state anxiety variable. An improvement in the depressive disorder leads to an improvement in the QoL – physical component. One can also predict that the less anxious subjects will demonstrate an improved perception on their QoL at the time of the assessment. Given that the model was not complete, we could affirm that the level of depression together with the state anxiety and other unknown factors could define a predictive model with a greater explanatory power.

The mental component of the QoL was dependent on the level of depression, as well as of the state anxiety, trait anxiety, extraversion and emotional stability of the subject.

It has been assumed that there were differences in how the variables taken into account had an impact on the mental component of the QoL of patients, and a linear regression analysis was performed to demonstrate how these variables contributed to perceiving the mental component of QoL and/or the ratio of these variables in the final predictive equation.

The independent variables were: depression, state anxiety, trait anxiety, emotional stability and extraversion, while the dependent variable was the mental component of the QoL (*Table 2*).

Table 2

The mental component of QoL related to the emotional variables

V.i.	**R^2 adj**	**F**	**p (sig)**	**β non-standard**	**β standard**	**Std.E**	**t**	**p (sig)**
Depression	0.73	34.37	0.00	- 0.80	- 0.29	0.31	- 2,52	< **0.01**
Anx-trait				- 0.14	- 0.11	0.18	- 0.79	0.43
Anx-state				- 0.73	- 0.52	0.17	- 4.15	< **0.01**
Extraversion				1.06	0.20	0.47	2.24	**0.02**
Stability				0.71	0.15	0.40	1.75	**0.08**

The prediction equation for the mental QoL component in patients with multiple sclerosis included the following components:

- R^2 adjusted was 0.73, meaning that the model explained 73% of the variance of the QoL - mental component variable;
- test F values, and the significance coefficients $p < 0.01$ confirmed that the model was valid;
- for depression, p was < 0.01, meaning that depression was a significant predictor of the QoL - the mental component;
- for trait anxiety, p was > 0.05, meaning that trait anxiety was not a significant predictor of the QoL - the mental component, therefore being removed from the predictive model;
- for state anxiety, p was < 0.01, meaning that state anxiety was a significant predictor of the QoL - the mental component;
- for extraversion, p was < 0.05, meaning that extraversion was a significant predictor of the QL - the mental component;
- for emotional stability, p was > 0.08, meaning that emotional stability was not a significant predictor of the QoL - the mental component, therefore being removed from the predictive model;
- the standardized beta coefficients showed that the depression and the extraversion variables were less important than the state anxiety variable in predicting/determining the degree of perception of the QoL - the mental component.

These results showed that the degree of perception of the mental component of the QoL depended largely on the degree of state anxiety, and to a lesser extent on depression and extraversion of the subjects. The same analysis indicated that the predictive model was not complete, respectively that there were other factors that could influence the variable QoL - the mental component.

Qualitative interpretation:

The model that used as predictor the depression and state anxiety variables was valid and explained 73% of the QoL variance. By following this model, one could observe the importance of state anxiety as a predictor for the QL – the mental component, and a greater explanatory power than the depression and extraversion variables. An improvement in state anxiety led to an improved QoL – the mental component. One could also predict that less depressed and extraverted subjects would show a better QoL at the time of the assessment. Given that the predictive model was not complete, we could state that the level of depression together with state anxiety, level of extraversion, and other unknown factors could define a predictive model with greater explanatory power.

Starting from the hypothesis that there were differences in how the variables taken into account intervened in the physical component of the QoL of the study patients, a linear regression analysis was performed to discover how these variables could contribute to perceiving the physical component of the QoL and/or the ratio of these variables in a predictive equation.

The independent variables were orientation, attention, memory, language, and the dependent variable was the physical component of the QoL (*Table 3*).

These results showed that the perceived physical component of the QL did not depend on the cognitive dysfunctions of the subjects. Both for orientation, attention, memory, language, and

Table 3

The physical component of QoL related to the cognitive variables

V.i.	R^2 adj	F	p (sig)	β non-standard	β standard	Std.E	t	p (sig)
Orientation	0.03	1.59	0.18	12.57	0.30	6.05	2.06	0.08
Attention				- 3.18	- 0.14	3.76	- 0.84	0.41
Memory				3.52	0.09	6.88	0.51	0.61
Language				- 1.35	- 0.02	8.79	- 0.15	0.87

duration of treatment, p was > 0.05, meaning that these variables were not significant predictors for the QoL – the physical component. The same analysis indicated that there were other factors that could influence the variable QoL – physical component.

Starting from the hypothesis that the mental component of the QoL was dependent on the degree of cognitive dysfunction, a linear regression analysis was performed to discover how these variables could contribute to the perceived mental component of the QL and/or the ratio of these variables in a predictive equation.

The independent variables were: orientation, attention, memory, language, with the dependent variable being the mental component of the QoL (*Table 4*).

These results showed that the degree of perception of the mental component of the QoL did not depend on the cognitive dysfunctions of the subjects. Both for orientation, attention, memory, language, and the duration of treatment, p was > 0.05, meaning that these variables were not significant predictors for the QoL – the mental component. The same analysis indicated that there were other factors that could influence the variable QoL – mental component.

Our research has unveiled some important aspects of how psychomental status could predict or influence the QL for patients diagnosed with multiple sclerosis, thus reinforcing the importance of reaching the correct diagnosis, and consequently instituting the most adequate therapy [3], [14].

By analyzing the results provided by our first general hypothesis, one could conclude that the ramifications of depression and anxiety regarding self-assessment on the QoL were considerable in multiple sclerosis patients, which was consistent with other scientific data [4], [8], [17]. Both of the two prediction models proved the correctness of the psychological variables that we used for calculating their influence on perceived QoL, showing that they can be used to predict to a large extent the perception on both the physical and the mental components of the QoL.

More specifically, we have found that the mental component of the perception of the QoL can be determined by using a predictive model that includes the depression variable in conjunction with

Table 4

The mental component of QoL related to the cognitive variables

V.i.	R^2 adj	F	p (sig)	β non-standard	β standard	Std.E	t	p (sig)
Orientation	0.01	1.15	0.34	- 9.84	0.26	5.53	1.77	0.18
Attention				- 1.62	- 0.08	3.42	- 0.47	0.63
Memory				1.13	0.03	6.26	0.18	0.85
Language				2.66	0.05	8.00	0.33	0.74

the state anxiety variable, along with the extraversion and the emotional stability variables, the latter two showing a smaller prediction potential. In the case of the perception of the physical component of the QoL, trait anxiety, extraversion and emotional stability have not been found to be significant predictors.

Thus, patients with low levels of depression and anxiety will significantly improve their ability to perform physical activities, will experience fewer somatic pains, and the intensity of their limitations will be less present. From the perspective of the mental dimension, patients will show fewer emotional problems, being more dynamic and perceiving their own general state of health as positive; same patients will interact socially more often and more adequately, and their mental health will be significantly better compared to depressed and anxious patients. Depression, negative thoughts and anxiety, restlessness and dissatisfaction with the long-term effects of the disease [14] can amplify the symptoms, and significantly reduce the perception on the QoL. The evolution of the disease can be fluctuating, and carries within itself the risk of worsening the symptoms from a psychological point of view. Counseling and psychological services together with therapy support groups can be of great help in treating depression, anxiety and the other symptoms specific for multiple sclerosis disability [9], [15].

Extraversion and emotional stability can only influence the mental component of the QoL, the extroverts and emotionally healthy patients feeling fewer symptoms related to the mental dimension of their QoL. Family therapy and counseling can prove extremely important, since mental disorders and behavioral changes affect the whole family, not just the patient.

The results provided by our second general hypothesis showed that the extent to which the cognitive variables (orientation, attention and concentration, memory and language) could help in predicting the perception of QoL and its physical and mental dimensions was not significant. The hypothesis was not confirmed. Self-assessment of the multiple sclerosis patients on their QoL was not influenced by their cognitive dysfunctions – a person with no major physiological or psychological limitations could have significant cognitive dysfunctions, while a person with

disabilities might not be affected at all at the cognitive level.

However, a careful evaluation is required to determine the cause of the mental disorders, since cognitive functions can be affected by both aging or medication, depression, anxiety, stress, and fatigue [9], [17].

5. Conclusions

The research confirmed only partially our working hypotheses. The small number of patients on whom this study was conducted, and the medium degree of disability of the patients did not allow us to generalize the results, but instead opened the prospect for further investigations and research.

A lot of additional questions may arise when one tries to assess the impact of a disease with all its implications on the QoL of an individual. It is also expected for other future studies to demonstrate the extent to which concrete actions and professional intervention on psychological variables, along with the perception on QoL can influence the general prognosis in patients with multiple sclerosis.

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