Multiple Sclerosis: Relationships between Locus of Control, Coping Strategies and Quality of Life
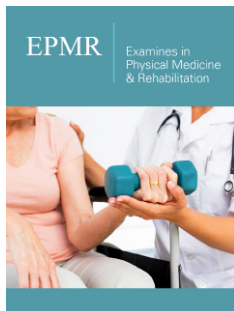
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Abstract

Multiple Sclerosis (MS) is a chronic, inflammatory, demyelinating disease affecting the central nervous system. It usually presents with a variety of physical, cognitive, and psychological signs and symptoms. The normal course of illness, unpredictable, leads patients to an inevitable reactive condition that affects their family and their own life. It is believed that individual persuasions about the ability to manage the events of life has direct consequences on the control of life itself, above all on treatment and medical care compliance. The aim of this study was to investigate the relationship between locus of control and the impact of psychological features in the choice of coping strategies in patients affected by MS and their influence on Quality of Life (QoL). For this reason, we enrolled 87 patients (66,7% women, 33.3% men; mean age 42.1) affected by relapsing–remitting multiple sclerosis according to Mc Donald's criteria and with disability corresponding to a mean score of 2.2 on Expanded Disability Status Scale (EDSS). Participants were followed periodically at our Multiple Sclerosis Centre. QoL was assessed using the SF-36 questionnaire. Clinical disease progression was evaluated using EDSS; locus of control was used as a psychological variable. Numerical data were expressed as mean and standard deviations, categorical variables as number and percentage. The results demonstrated that patients with an external locus of control had lesser perception of physical pain (p=0.0003), vitality (p=0.019), social activity (p=0.0022), physical condition indicator (p=0.017) and disease status indicator (p=0.019). On the other hand, internal locus decreased the "mental health" perception (p=0.006) and the disease status index (p=0.018). The clinical relevance of the relationship between QoL and locus of control is very important because it may provide information about the general health status of patients and can also help physicians to choose the best treatment option, mostly considering the significant role of therapy adherence.

Keywords: Multiple sclerosis; Cognitive therapy; Quality of life; Locus of control; Coping strategies; Disability

Introduction

MS is a complex disease, with signs and symptoms that are different from one person into another; this clinical variability depends on the various locations of the anatomical-pathological brain lesions. In addition to motor symptoms, psychological dysfunctions can be observed, as it is shown in several studies, in different extent, and in percentage between 14 and 57% [1]. Multiple Sclerosis (MS) affects women and men between the ages of 20 and 40 years, which is the age range in which life plans are outlined and crucial choices are made for the future [2,3]. The disease damages individuals in a complex and multifaceted manner, strongly affecting the social sphere not only of patients involved, but also of their caregivers. Signs and symptoms of the onset depend on the location of demyelinating brain lesions and can be highly variable from subject to subject [2]. The same applies to the frequency with

which they appear: With this regard, some symptoms are very frequent, others are rare or appear only years after diagnosis [4]. The multifaceted course of this disease, which is characterised by unpredictable alternations of exacerbations and remissions, does not allow clinicians to provide a certain future prognosis, specifically patients' QoL.

As is well known, the concept of stress (the body's reaction to any stimulus involving the central and autonomic nervous systems, the endocrine system, and the immune system) is developed because of shock. In the 1930's Selye [5] gave the first definition of this in the field of psychology, and introduced the concept of stressor to indicate the stimulus that induces a state of modification of the central nervous system. The terms "behaviour" and "reaction" indicate everything that the sufferer enacts following a traumatic event, and MS is among the diseases that cause an individual's reactive mode involving all human dimensions: emotional-affective, motor, cognitive and social. Receiving a diagnosis of MS may have a tough effect on patients and their caregivers, even because such an unpredictable disease may implicate a considerable emotional burden.

Each subject has personal resources, called coping, or strategies for adapting to stressful events (Cramer 2001). Coping strategies are partially determined by trust or doubt about the usefulness of a certain behaviour compared to other possible ones. Coping is a psychic and behavioural process that, unlike defence mechanisms, is conscious and intentional [6]. Perhaps the best-known definition is provided by Lazarus & Folkman in 1984 [7] "We define coping as the cognitive and behavioural efforts aimed at managing stressful situations, involving the perception of threat, loss or challenge. The individual's response is the result of a process of evaluating the various options available and the possible consequences; coping strategies, therefore, are partially determined by implicit confidence or doubt about the usefulness of a particular behaviour over other possible ones" [8].

Over a period of 25 years, several models have been proposed of the biopsychosocial system, that considers the flexibility of the patient's reactions constantly changing over time and in relation to one or more situational contexts . In the course of an illness, the patient may use several coping strategies: On the problem and on emotions. The first class of strategies is based on an assessment of the problem situation as affordable, in which the person implements action plans to best manage, and eventually resolve, his or her problem. Moreover, emotion-centred coping contemplates such manifestations as containing and reducing negative emotions [9]. Another involved psychological variable is the Locus of Control (LoC) which indicates the degree of perception compared to the possibility of one's own destiny and events. On one hand, an "external" LoC mainly attributes the control of what happens to destiny or to the "others". On the other hand, "internal" LoC implies the subject to be much more oriented towards considering destiny as an effect of its own actions and, therefore, like a "changing" variable. The LoC represents the mental attitude through which someone feels what can determine in terms of our actions and

their results, compared to the control exerted by case and external circumstances. Therefore, LoC is a useful predictor of the ability to manage chronic disease and a good QoL indicator in patients suffering from various diseases [10-12].

QoL was defined as the perception that an individual has about its life in relation with its cultural and moral context (OMS 1999). QoL in MS may be influenced by any symptom arising from the central nervous system damage, from mood disorders to fatigue, cognition, professional status, personality, and behavioural changes [9]. The objective of the present research work is to examine the relationship between LoC, coping strategies, and satisfaction profile (felt as subjective perception of QoL) in a population of patients with relapsing remitting MS. Individual beliefs about the ability or inability to cope with life events have direct consequences on life control and primarily on adherence to planned treatment/care. Compliance is basic because a patient who does not cooperate with treatment prescriptions, does not accept treatment, poses obstacles to the treatment process. This concept is closely related to coping, as adaptability, especially positive adaptability, is included among the tools for coping with the course of the disease [13].

Materials and Methods

Patients

The participants of this study were enrolled in the Multiple Sclerosis Centre of Azienda Ospedaliera Universitaria Policlinico Gaetano Martino of Messina. We included 87 patients (66,7% women, 33.3% men; mean age 42.1) with the diagnosis of relapsing-remitting MS. Patients had a disability corresponding to a mean score of 2.2 on EDSS. As regards the medical treatment, 57.5% of them had been treated with interferon; the remaining 42.5% had been treated with monoclonal antibodies.

Inclusion criteria: diagnosis of MS according to the revised McDonald criteria [14]; the lack of relapse within 90 days preceding the enrollment; lack of other medical conditions, psychotic disorders, identified by the diagnostic and statistical manual of mental disorders, version V; and absence of MS-related cognitive problems such as impairment of attention, information processing speed, memory, or executive functions. The study followed the ethical standards of the 1964 Helsinki declaration and written informed consent was obtained from all participants before the survey. They were assured that the transcript of the interview would remain strictly confidential and that patients would not be named in the final description and analysis.

Clinical evaluation

QoL was assessed using the SF-36 questionnaire, instead clinical disease progression was assessed using EDSS; LoC was used for psychological variable [15] SF-36 questionnaire consists of 36 items, which are used to calculate eight subscales: Physical Functioning (PF), Role Physical (RP), Bodily Pain (BP), General Health (GH), Vitality (VT), Social Functioning (SF), Role Emotional (RE), and Mental Health (MH). The first four scores can be summed to create the Physical Composite Score (PCS), while the last four

can be summed to create the Mental Composite Score (MCS). Scores for the SF-36 scales range between 0 and 100, with higher scores indicating a better HRQoL. EDSS is a method of quantifying disability in MS and monitoring changes in the level of disability over time. It is widely used in clinical trials and in the assessment of people with MS. EDSS ranges from 0 to 10 in 0.5-unit increments that represent higher levels of disability. Scoring is based on an examination by a neurologist. EDSS steps 1.0 to 4.5 refer to people with MS who can walk without any aid and is based on measures of impairment in eight Functional Systems (FS) [16]. The LoC Scale (LCS) [10] is a 29-item questionnaire that measures an individual's level of internal versus external control of reinforcement [10]. The Coping Inventory for Stressful Situations scale (CISS) [17] measures three types of coping styles. It helps to determine the preferred coping style of an individual and contributes to the overall understanding of the relationship between the individual's coping style and his or her personality. Results are useful for treatment and intervention planning.

The Situation Specific Coping, part of CISS, is a 21-item scale that examines a precise social situation, such as a change in social situation, change in a relationship, or a personal conflict. Other scales are Task-Oriented Coping, Emotion-Oriented Coping, Avoidance-Oriented Coping; Distraction; Social Diversion. The development of the CISS was undertaken for three reasons: (i) The relative lack of consensus among the numerous researchers in the coping area; (ii) The psychometric weakness of many existing scales (relatively low reliabilities, unstable and unsubstantiated factor structure, and lack of empirical support); (iii) The need for a reliable and valid coping measure to test the interaction model of stress, anxiety, and coping. Task-Oriented Coping consists of describing purposeful task-oriented efforts aimed at solving the problem, cognitively restructuring the problem, or attempts to alter the situation. The main emphasis is on the task or planning, and on attempts to solve the problem. Emotion-Oriented Coping refers to emotional reactions that are self-oriented. Reactions include emotional responses, self-preoccupation, and fantasising. In some cases, the reaction increases stress. The reaction is oriented towards the person. Avoidance-Oriented Coping describes activities and cognitive changes aimed at avoiding the stressful situation. The person distracting oneself with other situations, or tasks, or via social diversion [18,19].

Statistical Analysis

The numerical data were expressed as mean and standard deviations and the categorical variables as number and percentage. Parametric tests were applied because most variables were normally distributed such as verified by means of the Shapiro-Wilk normality test. Student t-test was used to assess the existence of significant differences between patients undergoing first and second line treatments, with reference to all examined variables. Pearson's correlation test was applied to assess the existence of significant interdependence between all variables related to QoL, both referred to individual profile (physical activity, physical limitation, etc.,) and to standardized profile (PCS and MCS) and the following variables: age, disease duration, EDSS, coping strategies and external or internal locus of control. Statistical analyses were performed using SPSS 22.0 for the Windows package. A value of p<0,05 two sided was considered to be statistically significant.

Results

With reference to the description of the examined sample (Table 1), it is mainly made up of women (66.7%), married (69%), employed (52.9%) and undergoing first-line treatment (57.5%). The mean age of the respondents is 40.1±9.8, with about 12 years of education, with an average duration of illness of about 10 years and an EDSS score of 2.2 (Table 2). Comparing the different types of medical treatment with reference to QoL (Table 3), there were no significant differences, except for the parameter "Role-emotional" (p=0.019), which was significantly higher in the group of interferon treated patients (63.3±42.2) compared to monoclonal antibodies ones (43.0±39.1). Comparing the different types of medical treatment with reference to coping strategies, a significant difference was found for "emotion" that results significantly lower in patients undergoing first line treatment (54.7±30.7) than to second line treatment (69.6±25.6) (p=0.018). Lastly, the LoC analysis showed an external locus prevalence both for patients attending the first line (22.8±8.9) and the second line (21.1±8.8) treatment, that doesn't significantly differ (p=0.352); an internal locus was present only in few patients attending the first line (11.1±6.8) and the second line (12.6±6.2) treatment, and there was not a significant difference (p=0.219). The EDSS score does not differ significantly between subjects undergoing first- or second-line medication (p=0.471).

Table 1: Basic characteristics of enrolled patients.

		Frequency	Percentage
Gender	Male	29	33.30%
	Female	58	66.70%
Civil status	Unmarried	24	27.60%
	Married	60	69.00%
	Divorced/widowers	3	3.40%
Profession	Unoccupied	41	47.10%
	Employed	46	52.90%
Treatment	First line	50	57.50%
	Second line	37	42.50%

Table 2: Descriptive statistics of demographic parameters, EDSS, quality of life, coping strategies and locus of controls measured on enrolled patients.

PCS: Physical Component Summary; MCS: Mental Component Summary.

	Variables	Mean±SD
	Age	40.1±9.8
	Years of education	12.1±3.0
	Disease duration	10.3±6.5
	EDSS score	2.2±1.9
Quality of life	Physical Functioning (PF)	62.8±29.0
	Role-Physical (RP)	45.4±41.2
	Bodily Pain (BP)	59.8±30.6
	General Health (GH)	50.5±20.1
	Vitality (VT)	46.1±19.2
	Social Functioning (SF)	60.2±25.7
	Role-Emotional (RE)	54.7±41.8
	Mental health (MH)	60.1±23.2
	PCS	40.1±11.1
	MCS	42.2±12.1
Coping strategies	Manovra	54.5±337.5
	Emotion	60.3±29.5
	Avoidance	65.7±31.7
	Distraction	67.2±28.4
	Social div.	55.4±32.8
Locus	Internal locus	13.0±6.7
	External locus	22.5±10.4

Table 3: Mean±SD and comparison between patients undergoing first and second line treatment (demographic parameters, EDSS, quality of life, coping strategies, and locus of controls).

PCS: Physical Component Summary; MCS: Mental Component Summary.

	Variables	First Line Treat	Second Line P-Value Treat	
	Age	42.1±10.2	37.2±8.7	0.023
	Years of education	11.9±3.2	12.4±2.9	0.453
	Disease duration	10.2±6.6	10.6±6.5	0.935
	EDSS score	2.2±1.8	2.4±1.9	0.471
Quality of life	Physical Functioning (PF)	64.0±28.7	61.4±29.9	0.721
	Role-Physical (RP)	47.3±41.0	43.0±42.0	0.451
	Bodily Pain (BP)	60.7±30.1	58.5±31.7	0.735
	General Health (GH)	50.3±20.8	50.8±19.3	0.997
	Vitality (VT)	46.3±20.2	46.1±18.2	0.958
	Social Functioning (SF)	60.0±25.7	60.6±26.2	0.814
	Role-Emotional (RE)	63.3±42.2	43.0±39.1	0.019
	Mental health (MH)	62.0±23.1	57.5±23.5	0.335
	PCS	39.6±11.3	40.7±11.0	0.673
	MCS	43.7±12.4	40.2±11.6	0.186
Coping strategies	Manovra	50.7±34.1	60.8±33.3	0.171
	Emotion	54.7±30.7	69.6±25.6	0.018
	Avoidance	64.5±30.3	67.9±34.9	0.629
	Distraction	66.2±26.4	68.9±32.3	0.669
	Social div.	52.4±31.9	60.3±34.7	0.274

Locus	Internal locus	11.1±6.8	12.6±6.2	0.219
	External locus	22.8±8.9	21.1±8.8	0.352

Focusing the attention on relationship between variables (Table 4) we found a significant positive correlation between years of disease and EDSS (r=0.322; p = 0.002), which means that the EDSS score increases in line with the increase in disease years. In addition, there were no significant correlations between years of disease and the QoL perception (Table 4). On the contrary, the EDSS score was significantly correlated to all QoL indexes, but it was not correlated to "mental health". The perception of general health and the physical state indicator decreased only with the increasing of patients' age (p=0.007 and p=0.009, respectively).

Table 4: Pearson's correlation test between quality of life and age, disease duration and EDSS.

PCS: Physical Component Summary; MCS: Mental Component Summary.

	Age	Disease Duration	EDSS
Physical Functioning (PF)	r=-0.201	r=-0.107	r=-0.570
	p=0.062	p=0.325	p<0.001
Role-Physical (RP)	r=-0.190	r=-0.114	r=-0.355
	p=0.078	p=0.291	p=0.001
Bodily Pain (BP)	r=-0.231	r=-0.046	r=-0.507
	p=0.023	p=0.675	p<0.001
General Health (GH)	r=-0.286	r=-0.148	r=-0.456
	p=0.007	p=0.172	p<0.001
Vitality (VT)	r=-0.143	r=-0.065	r=-0.296
	p=0.189	p=0.550	p=0.006
Social Functioning (SF)	r=-0.136	r=-0.050	r=-0.324
	p=0.208	p=0.642	p=0.002
Role-Emotional (RE)	r=-0.050	r=-0.125	r=-0.294
	p=0.648	p=0.249	p=0.006
Mental health (MH)	r=-0.174	r=-0.014	r=-0.192
	p=0.106	p=0.894	p=0.174
PCS	r=-0.279	r=-0.084	r=-0.601
	p=0.009	p=0.439	p<0.001
MCS	r=-0.062	r=-0.014	r=-0.244
	p=0.566	p=0.899	p=0.023

Examining the Pearson's correlation test between QoL and coping strategies (Table 5), we found that maneuver is significantly and positively correlated with general health (p=0.048), social functioning (p=0.015), role-emotional (p=0.019), mental health (p=0.001) and MCS (p=0.048). Emotion appears to be significantly and negatively correlated with physical functioning (p=0.014), role physical (p=0.017), bodily pain (p=0.001), vitality (p<0.001), social functioning (p=0.002), role-emotional (p <0.001), mental health (p=0.001) and MCS (p=0.008). Avoidance is significantly and positively correlated with general health (p=0.011), vitality (p=0.001), social functioning (p <0.001), role-emotional (p=0.011), mental health (p<0.001) and MCS (p=0.012). Distraction is significantly and positively correlated with vitality (p=0.016), social functioning (p=0.017) and mental health (p=0.008). Social divers is significantly and positively correlated with vitality (p=0.019), social functioning (p=0.037), mental health (p=0.001) and MCS (p=0.006).Examining the Pearson's correlation test between LoC and QoL (Table 6), we found that internal locus is significantly and inversely correlated with role-emotional (p = 0.009), mental health (p<001) and MCS (p=0.009) while external locus is inversely correlated with all aspects of QoL.

Table 5: Pearson's correlation test between QoL and coping strategies.

PCS: Physical Component Summary; MCS: Mental Component Summary.

Quality of Life	Coping Strategies				
	Manovra	Emotion	Avoidance	Distraction	Social div.
Physical Functioning (PF)	r=0.072	r=-0.265	r=0.034	r=0.006	r=-0.000
	p=0.515	p=0.014	p=0.757	p=0.954	p=0.963
Role -Physical (RP)	r=0.087	r=-0.258	r=0.164	r=0.207	r=0.030
	p=0.426	p=0.017	p=0.134	p=0.057	p=0.784

Bodily Pain (BP)	r=0.118	r=-0.352	r=0.158	r=0.144	r=0.022
	p=0.281	p=0.001	p=0.147	p=0.189	p=0.838
General Health (GH)	r=0.215	r=-0.179	r=0.275	r=0.184	r=0.097
	p=0.048	p=0.101	p=0.011	p=0.091	p=0.378
Vitality (VT)	r=0.204	r=-0.380	r=0.346	r=0.261	r=0.256
	p=0.062	p<0.001	p=0.001	p=0.016	p=0.019
Social Functioning (SF)	r=0.264	r=-0.326	r=0.365	r=0.258	r=0.227
	p=0.015	p=0.002	p=0.001	p=0.017	p=0.037
Role-Emotional (RE)	r=0.253	r=-0.402	r=0.274	r=0.172	r=0.173
	p=0.019	p<0.001	p=0.011	p=0.115	p=0.114
Mental health (MH)	r=0.397	r=-0.379	r=0.371	r=0.284	r=0.362
	p<0.001	p<0.001	p<0.001	p=0.008	p=0.001
PCS	r=-0.015	r=-0.205	r=0.087	r=0.099	r=-0.014
	p=0.892	p=0.060	p=0.426	p=0.365	p=0.899
MCS	r=0.301	r=-0.401	r=0.380	r=0.245	r=0.411
	p=0.048	p=0.008	p=0.012	p=0.113	p=0.006

Table 6: Pearson's correlation test between QoL and LoC.

PCS: Physical Component Summary; MCS: Mental Component Summary.

Quality of Life	Internal Locus	External Locus
Physical Functioning (PF)	r=-0.061	r=-0.273
	p=0.579	p=0.011
Role -Physical (RP)	r=-0.080	r=-0.251
	p=0.469	p=0.021
Bodily Pain (BP)	r=-0.037	r=-0.416
	p=0.739	p<0.001
General Health (GH)	r=-0.036	r=-0.302
	p=0.746	p=0.005
Vitality (VT)	r=-0.082	r=-0.326
	p=0.458	p=0.002
Social Functioning (SF)	r=-0.200	r=-0.308
	p=0.067	p=0.004
Role-Emotional (RE)	r=-0.281	r=-0.231
	p=0.009	p=0.034
Mental health (MH)	r=-0.420	r=-0.333
	p<0.001	p=0.002
PCS	r=0.074	r=-0.321
	p=0.504	p=0.003
MCS	r=-0.401	r=-0.367
	p=0.009	p=0.018

Finally, examining the results obtained by Pearson's correlation test between LoC and coping strategies (Table 7), it can be seen that the internal locus is not significantly correlated with any coping strategy; instead, the external locus is significantly and positively correlated with emotion (p=0.001). Some significant correlations are shown in Figure 1 by means of scatter plot.

Table 7: Pearson's correlation test between LoC and coping strategies.

Coping Strategies	Internal locus	External locus
Manovra	r=-0.127	r=-0.152
	p=0.423	p=0.343
Emotion	r=0.258	r=0.494
	p=0.099	p=0.001

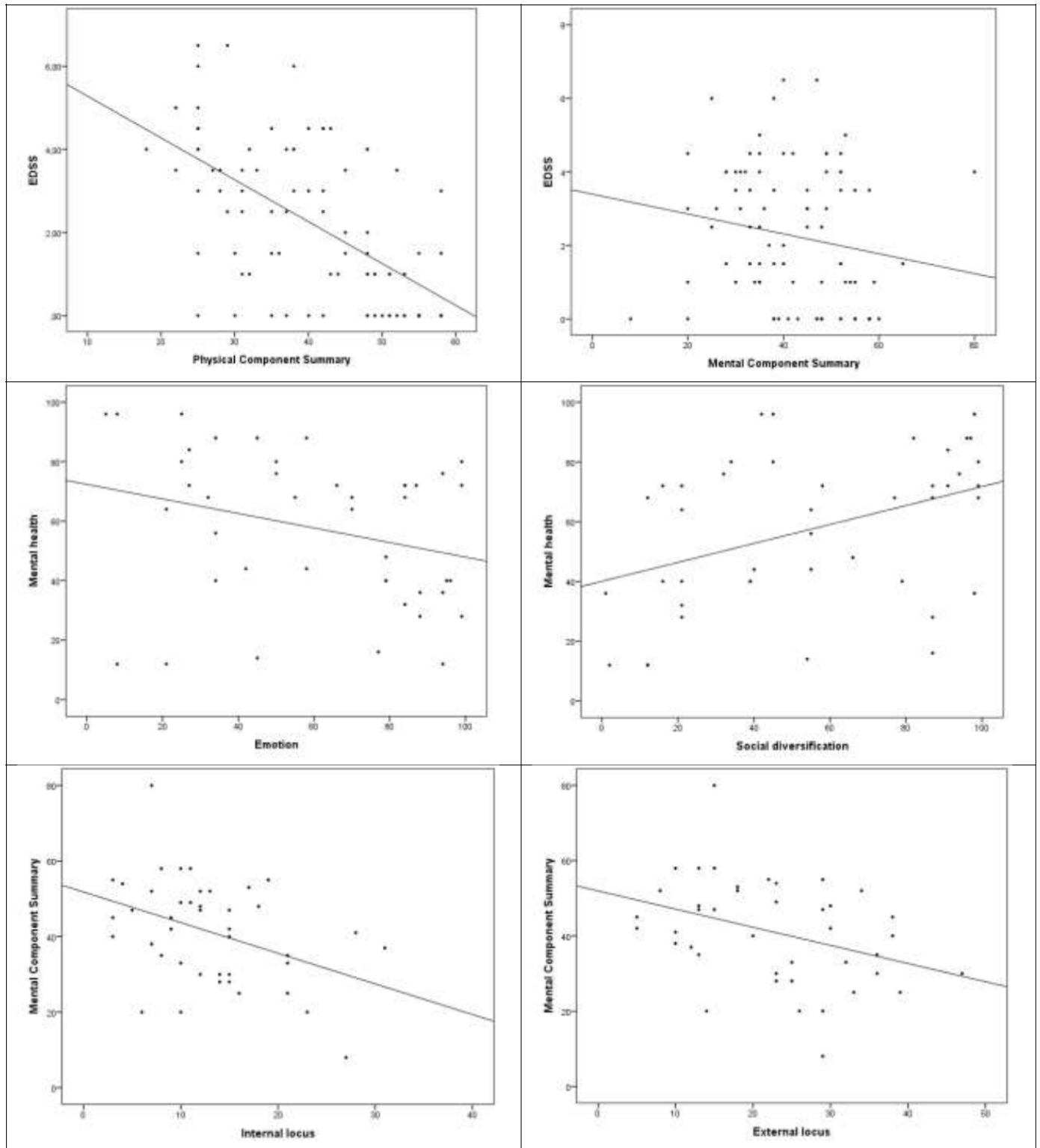|		
Avoidance	r=-0.094	r=0.045
	p=0.554	p=0.781
Distraction	r=-0.070	r=-0.020
	p=0.660	p=0.900
Social div.	r=-0.262	r=-0.011
	p=0.094	p=0.946

Figure 1: Scatterplot of correlation between variables.

Discussion

In this study, we focused on the relationship between LoC, coping strategies and QoL. The second aim was to analyze some differences in drug treatment (first and second line). From the results obtained, emotionality appeared to be higher in the group of patients treated with interferon than those with monoclonal antibodies, as perceived QoL. Moreover, comparing the different types of medical treatment with reference to coping strategies, "emotion" is significantly lower in patients undergoing first-line treatment than in second-line treatment. There is a higher prevalence of external locus (for both first-line and second-line treatment patients), which did not differ significantly; an internal locus was present in only a few patients attending first-line and second-line treatment, and there were no significant differences. The EDSS score did not differ significantly between subjects undergoing first- or second-line therapy. There is a significant positive correlation between years of illness and EDSS, meaning that the EDSS score increases with increasing years of illness.

The years of illness do not change perception with respect to QoL, except for mental health. Perceptions of general health and physical well-being only decrease with increasing patient age. The coping strategies implemented by patients highlighted the influence with respect to perceived QoL, with respect to general health, social function, emotional role and general health, the predominant component of which is emotions. In this study, the strategies most commonly used as coping are avoidance and distraction, which are found to be functional and good adaptors, improving patients' QoL and enabling an active social life, with positive repercussions on mental health. On the contrary, if we look at the role of external locus with respect to perceived QoL, we can say that these patients had higher emotionality, used dysfunctional coping strategies, and had a negative impact on QoL. Patients with internal locus would use coping strategies, which enabled them to cope with issues inherent in the disease, with good repercussions on QoL. Our results agrees with previous work [20,21], and are in line with the theory of stress and coping [7,22]. Therefore, LoC must be considered to be antecedent to coping strategies.

Analysis of the literature shows that in the course of the illness, avoidance strategies are considered ineffective, as patients would not focus on functional coping strategies [23]. Our study disagrees with these findings and was able to provide evidence with respect to the importance of avoidance strategies, which is in agreement with other more recent studies, where a negative relationship between avoidance-centred coping strategies and psychological well-being of MS patients was found [24,25]. Our results show that avoidance is an adaptive strategy and if it is used for a short period of time, it may help to avoid negative thoughts and depressive reactions, as highlighted in other research studies [26-28].

Conclusion

The study purpose is helping to provide an overview on clinical and psychological aspects of MS. However, our study suffers from some limitations. Sample size does not allow us to generalize our results in the general population. As a pilot study, it is auspicious to be re-adapt in a wider sample. In addition, it would be useful to replicate the study in patients with greater clinical impairment; this would allow us to analyze the various constructs covered by our research. Furthermore, during psychological assessment, participants did not show memory difficulties, attention disturbance, disruption of linguistic or executive functions. Therefore, no cognitive evaluation was made, even though it represents an essential element in a patient's whole assessment. In the current routine, a patient's medical evaluation is mostly focused on physical and functional aspects of the disease. Therefore, physicians' attention is aimed at evaluating physical limitations above all. Psychological aspects and the repercussions over personal life (in the familiar and social dimension) and QoL expectations have a secondary role in this framework and are often considered mainly for research purposes [29,30].

The clinical relevance of the relationship between QoL and LoC is very important because it may provide information about patients' general health status and can also help physicians to choose the best treatment, mostly considering the significant role of the therapy adherence. Evaluating psychological aspects of patients affected by MS may be a supportive element for the specialist because it may help to reach a global point of view, in order to plan a multidisciplinary approach. Until now, there are no documents in literature that focus on clinical, psychological and cognitive variables and how they change during time, related to QoL. Patients with MS undergo a continuous adaptation process to an unpredictable disease.

From clinical experience and preliminary work, we observed that dysfunctional factors influence the awareness and perception of one's own illness but, on the contrary, the ability to overcome difficulties related to the disease (coping) contribute to maintaining psychological and physical well-being, with a great impact on the patient's QoL. LoC also has an important impact on patient behaviour, for example as regards pharmacological treatment adherence, essential for the course of the disease. Receiving psychological support at the time of diagnosis and following a psychotherapeutic path may contribute to the delicate process of analysing and accepting the disease, by listening to emotional suffering and providing indications on how stressful events should be managed. The Psychologist/Psychotherapist can optimise residual abilities, to safeguard as much as possible the performance in daily life activities. These strategies are helpful in guaranteeing an improvement of QoL both in newly diagnosed patients and in those at other disease stages [31,32]. Individual convictions about the ability to manage life events have direct consequences on the control of the same, and in particular on the adherence to the treatment provided.

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