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Health-related quality of life in multiple sclerosis: links to mental health, self-esteem, and self-compassion

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Multipl sklerozda sağlıkla ilişkili yaşam kalitesinin ruh sağlığı, benlik saygısı ve öz-duyarlılık ile ilişkisi

Özet

Amaç: Multipl skleroz (MS) hastalarında sağlıkla ilişkili yaşam kalitesinin (SYK) ruh sağlığı, benlik saygısı ve öz-duyarlılıkla olan ilişkisini incelemek.

Yöntem: Bu betimsel ve kesitsel çalışma için toplam 89 gönüllü Türk MS hastası hasta bilgi formunu, Rosenberg Benlik Saygısı Ölçeği'ni, Öz-Duyarlılık Ölçeği'ni, Hastane Anksiyete Depresyon Ölçeği'ni ve MS Uluslararası Yaşam Kalitesi Anketi'ni doldurmuştur. Deprese hastalar SYK, benlik saygısı ve öz-duyarlılık açısından deprese olmayan hastalarla karşılaştırılmıştır. SYK, benlik saygısı, öz-duyarlılık ve ruh sağlığı göstergeleri arasındaki basit korelasyonlar hesaplanmış ve ardından hiyerarşik regresyon analizleri gerçekleştirilmiştir.

Bulgular: Deprese MS hastaları deprese olmayanlara göre anlamlı düzeyde daha düşük SYK, benlik saygısı ve öz-duyarlılığa sahiptir. Hiyerarşik çoklu regresyon analizine göre fiziksel SYK özürlülük ve öz-duyarlılık tarafından anlamlı düzeyde yordanmıştır ve bunlar toplam varyansın %48'ini açıklamıştır. Anksiyete ve benlik saygısı, psikolojik SYK toplam varyansının %52'sini açıklamıştır. Sosyal SYK depresyon ve benlik saygısı tarafından anlamlı düzeyde yordanmıştır ve bu ikisi toplam varyansın %21'ini açıklamıştır.

Sonuç: MS'in ve özürlülüğün sonuçları değiştirilemeyebilir ancak benlik saygısı ve öz-duyarlılık gibi kendilikle ilişkili özellikler SYK'yı artırma amacı güden psikososyal müdahalelerle değişimlenebilir. Bu çalışmanın bulguları MS hastalarında SYK'nın farklı boyutlarını artırmaya çalışırken hangi psikososyal faktörler üzerinde çalışılması gerektiği konusunda birtakım içgörüler sunmaktadır. Öz-duyarlılığı artırmak fiziksel alanda SYK'yı iyileştirebilir, öte yandan benlik saygısı ve kendilik değeri üzerinde çalışmak SYK'nın psikososyal alanına katkıda bulunabilir.

Anahtar kelimeler: Multipl skleroz, sağlıkla ilişkili yaşam kalitesi, depresyon, anksiyete, benlik saygısı, öz-duyarlık

Health-related quality of life in multiple sclerosis: links to mental health, self-esteem, and self-compassion

Abstract

Aim: To examine the association of health-related quality of life (HRQoL) with mental health, self-esteem, and self-compassion in multiple sclerosis (MS) patients.

Methods: For this descriptive and cross-sectional study, a total of 89 volunteering Turkish MS patients completed the patient information form, Rosenberg Self-Esteem Scale, Self-Compassion Scale, Hospital Anxiety and Depression Scale, and MS International Quality of Life Questionnaire. Depressed patients were compared with nondepressed patients in terms of HRQoL, self-esteem, and self-compassion. Bivariate correlations between HRQoL, self-esteem, self-compassion, and mental health indices were calculated followed by hierarchical regression analyses.

Results: Depressed MS patients had significantly lower HRQoL, self-esteem, and self-compassion compared to their nondepressed counterparts. Hierarchical multiple regression analysis showed that physical HRQoL was significantly predicted by disability status and self-compassion, explaining 48% of the total variance. Anxiety and self-esteem explained 52% of the total variance of psychological HRQoL. Social HRQoL was sinificantly predicted by depression and self-esteem, which explained 21% of the total variance.

Conclusion: The sequel of MS and disability may not be modifiable, but self-related traits including self-esteem and self-compassion can be modified through psychosocial interventions to improve HRQoL. The findings of the current study provided insights to which psychosocial factors to address in improving different domains of HRQoL in MS patients. Cultivating self-compassion may increase HRQoL in the physical domain, while working with self-esteem and self-worth may improve the psychosocial domain.

Keywords: Multiple sclerosis, health-related quality of life, depression, anxiety, self-esteem, self-compassion

INTRODUCTION

Multiple sclerosis (MS) is a chronic, progressive, and inflammatory autoimmune disease of the central nervous system characterized by demyelination and axonal loss. MS typically occurs between 20 and 40 years of age and is two-fold more common in women (1). The prevalence of MS is highest for North America and West Europe (> 100 / 100.000) and is 20-60 / 100.000 for Turkey (2). MS is the most common non-traumatic cause of neurological disability in young adults (3). The disease generally involves periods of exacerbation and remission, leading to various symptoms including problems with vision, fatigue, pain, paresis, spasticity, loss of balance, cognitive impairment, and sexual dysfunction (1). Psychiatric comorbidity, particularly depression is very common in MS due to various biochemical, genetic, and social factors (4). It was reported that depression is 20% more prevalent in MS patients than the general population (5). Compared to other neurological diseases, the prevalence of depression in MS was also reported to be high (6).

Being a chronic disabling disease with an ambiguous course and high psychiatric comorbidity, MS has a profound negative impact on health-related quality of life (HRQoL) (7-9). HRQoL is an important end-point indicator of healthcare and is a multidimensional concept covering physical health, level of independence, psychological health, spirituality, social relationships, and environmental features (10,11). MS patients suffer from psychosocial losses such as losing the ability to work and narrowing of one's social network, which lead to alterations in one's self-concept and reduce HRQoL, as well as the negative physical and neurological sequelae of the disease (12,13). Previous studies underscored the role of psychosocial factors including low self-efficacy, low self-esteem, low social support, and maladaptive coping in diminished HRQoL in MS (13-17). Above all, depression was found to be one of the most powerful predictors of HRQoL in MS patients (18-21).

Depression and MS both affect the way people view themselves. The cognitive model of depression posits that depressed individuals show distortions in their self-views and have low self-worth (22). Being a chronic disease leading to neurological disability, MS also influences one's self-views and self-worth via disease symptoms which impose limitations to role performance and affect multiple roles or self-aspects (wife, mother, executive, jogger, etc.). Charmaz posited that disease-related experiences lead to changes in one's self-views and enforce patients to redefine their self-constructs (23). Previous research supported this assumption as it was found that MS patients' self-views, which include constructs such as self-esteem and self-compassion, were deteriorated compared to healthy controls (24-26). Self-esteem refers to the judgment of one's self-worth, whereas self-compassion is defined as approaching one's self in a compassionate manner, being mindful toward negative emotions without over-identifying with them, and seeing one's own failures as a natural part of being human (27-29).

Low self-esteem and low self-compassion were consistently associated with poorer mental health outcomes in various samples (30-34). In a similar vein, Taylor and Brown argued that having an enhanced sense of self-worth helps people in responding adaptively to adverse life events such as being diagnosed with a chronic disease (35,36). However, other researchers have reported that inflated levels of self-esteem may result in an unhealthy, self-centered personality which deteriorates well-being (37-

41). Unlike self-esteem, which refers to an individual's perceptions of his/her worth, self-compassion is independent of evaluations of self-worth. People high in self-compassion tend to positively respond to negative events such as making a mistake, failing in something, or experiencing distress due to disease symptoms (42). Higher self-compassion corresponds to being mindful toward negative affective states and offering oneself soothing and kindness rather than harsh self-directed critisms or over-identification with negative feelings and the victim role; whereas high self-esteem may not be such a source of relief during hard times because it is dependent upon self-worth and achievement. In other words, self-compassion seems to be a more preferable strength for people with chronic illness because unlike self-esteem, it is not related to the level of "achievement" (being able to independently carry on activities of daily living etc.). A self-compassionate MS patient would find it easier to accept his/her condition and show adaptive responses to disease-related problems, which in turn would enhance well-being and HRQoL (43). Previous studies showed that self-compassion is positively related to happiness, quality of life, optimism, positive affect, life satisfaction, and health promoting behaviours, while it was negatively associated with depression, anxiety, neuroticism, and negative affect in various samples including college students and HIV patients (27,28,30,32,33,45,46). Thus, the current study aimed to compare self-esteem and self-compassion in terms of their associations to HRQoL dimensions in MS patients.

The level of self-esteem in MS patients compared to the general population and its linkage to various outcome variables were addressed by researchers. Beatus et al. (47) posited that the physical and psychological sequela of MS negatively impact work life, social life, and physical independence, leading to deteriorations in self-esteem and self-worth. Indeed, it was reported that MS patients have lower levels of self-esteem compared to healthy controls (24-26). Dlugonski and Motl (48) found that self-esteem is negatively linked to the physical and psychological dimensions of HRQoL in MS patients. On the other hand, studies that assess self-compassion in MS patients are scarce. In one study, it was found that self-compassion had a positive correlation with HRQoL among MS patients (49).

In the literature, studies examining the association between self-views and HRQoL in MS patients seem to be limited. Yet both self-esteem and self-compassion can serve as protective psychosocial resources which can be promoted through psychosocial interventions in order to improve HRQoL in MS patients and thus contribute to reducing health costs. Based on the theoretical accounts regarding the association between self-views and well-being, the current study aimed to test a model where HRQoL domains were regressed on disability status, depression, anxiety, self-esteem, and self-compassion in a sample of MS patients. The secondary aim of the study was to compare self-esteem, self-compassion, and HRQoL in depressed and nondepressed MS patients. The hypotheses of the current study were as follows:

(1) Depressed MS patients have significantly lower self-esteem, self-compassion, and HRQoL scores compared to nondepressed MS patients.

(2) Disability status, depression, anxiety, self-esteem, and self-compassion predict the physical domain of HRQoL.

(3) Depression, anxiety, self-esteem, and self-compassion predict the psychological domain of HRQoL.

(4) Depression, anxiety, self-esteem, and self-compassion predict the social domain of HRQoL.

METHOD

Design and setting

The study was planned as a descriptive and cross-sectional study. It was conducted at the Neurology Department of the Dokuz Eylul University Hospital from September 2016 to December 2016.

Participants

Patients who attended the Multiple Sclerosis Clinic of the Dokuz Eylul University Hospital for routine check-ups were invited to participate in the study. During the study period, 141 patients attended the clinic and the study sample consisted of 89 eligible patients. Eligibility criteria were being 18-60 years old, willing to participate in the study, being able to speak and understand Turkish, and being diagnosed with definite MS. Exclusion criteria were having severe cognitive impairment as reported by the attending neurologist, having an exacerbation during the last month, receiving corticosteroid treatment in the last month, being pregnant, and being diagnosed with a psychotic disorder.

Measures

Data Collection Form

A data collection form was prepared by the researchers in order to investigate sociodemographic (sex, age, educational status, marital status, number of children, employment status, and level of income) and clinical characteristics (disease duration, number of past MS attacks, and treatment).

Expanded Disability Status Scale (EDSS)

EDSS is a widely used measure of the neurological impact of MS and is a clinical assessment tool which relies on the standard neurological examination conducted by a medical doctor. It rates disease severity on a scale of 0 (normal) to 10 (death due to MS). Scores between 0 and 3.5 indicate full ambulation, whereas scores of 4.0 and above indicate limited ambulation. Scores of 6.0 correspond to being able to walk approximately 100 m with assistance on one side, while scores of 6.5 indicate being able to walk 20 meters with bilateral assistance. Individuals with a score of 7.0 and 7.5 need to use wheelchairs (50).

Multiple Sclerosis International Quality of Life Questionnaire (MUSIQOL)

The MUSIQoL is a 5-point Likert type scale consisting of 31 questions and 9 subscales including activities of daily living (ADL, 8 items), psychological well-being (PWB, 4 items), symptoms (SPT, 4 items), relationships with friends (RFr, 3 items), relationships with family (RFa, 3 items), sentimental

and sexual life (SSL, 2 items), coping (COP, 2 items), rejection (REJ, 2 items), and relationships with healthcare system (RHCS, 3 items). The MUSIQOL was developed by Simeoni et al. (51) in order to assess HRQoL in MS patients. The index score is computed as the mean of the subscale scores. All 9 dimensions and the index score are linearly transformed and standardized on a 0 to 100 scale, where 0 indicates the worst possible level of HRQoL and 100 indicates the best level. The Turkish version of the MUSIQOL was developed and tested for validity and reliability by Simeoni et al. (51). In the current study, the Cronbach alpha value of the total MUSIQOL was found to be 0.89.

Hospital Anxiety and Depression Scale (HADS)

The HADS, which is a 14-item 4-point Likert type scale, was developed for determining the risk for and severity of depression and anxiety in medical samples (52). This scale is not a diagnostic tool but can be used for determining risk groups on short notice. Validity and reliability of the Turkish version of the HADS was established and cut-off points for depression and anxiety were reported as 7 and 10 for the Turkish population, respectively (53). In the current study, the Cronbach alpha coefficient of the depression and anxiety subscales were found to be 0.81 and 0.84, respectively.

Rosenberg Self-Esteem Scale (RSES)

This 10-item 4-point Likert type scale was developed by Rosenberg in order to evaluate global self-esteem (29). The Turkish adaptation of the RSES was conducted by Çuhadaroğlu (54), who concluded that the Turkish version of the scale was valid and reliable. Total scores may range between 0 and 30, where higher scores correspond to higher levels of self-esteem. In the current study, the Cronbach alpha coefficient of the RSES was found to be 0.89.

Self-Compassion Scale (SCS)

The SCS was developed by Neff (27) in order to evaluate the level of self-compassion in adults. The SCS is a 5-point Likert type scale with 26 items. The Turkish validity and reliability study of the SCS was carried out by Akın et al. (55). For the Turkish SCS, total self-compassion scores were calculated by adding up all 26 items after reverse scoring. Total scores may range between 26 and 130, where higher scores indicate higher levels of self-compassion. In the current study, the Cronbach alpha coefficient of the total SCS was found to be 0.66.

Data collection

Ethical approval for the study was granted by the Dokuz Eylul University School of Medicine's Noninvasive Clinical Research Ethics Board (protocol number 2859-GOA, decision number: 2016/22-19). Written informed consent of all patiens was obtained. The EDSS scores of the patients were calculated by the second author. The pencil and paper instruments took approximately 20 minutes to fill and were individually administered to the participants in a quiet room at the hospital after medical examinations. Participants who had difficulty with the questionnaires due to neurological disability were aided by the first author who read the questions to them and marked their responses.

Statistical analysis

Data was analysed using the IBM SPSS 20 software. For the regression analysis, the subscales of the MUSIQOL were combined into composite variables. ADL was combined with SPT to produce a composite physical HRQoL score, PWB was combined with COP and SSL to produce a composite psychological HRQoL score, and RFr, RFa, REJ, and RHCS were combined to obtain a composite social HRQoL score. For statistical analysis, descriptive statistics, independent samples t-test, chi-square test of independence, Pearson correlations, and multiple hierarchical regression analysis were used. Independent samples t-tests were run to compare depressed and nondepressed patients in terms of self-esteem, self-compassion, and HRQoL parameters while the chi-square test of independence was used to compare these two groups according to sex. The associations between disability status, self-esteem, self-compassion, and HRQoL parameters were examined using Pearson correlations prior to hierarchical regression analyses. Level of statistical significance was set at $p < .05$ (two-tailed).

RESULTS

Demographic and clinical characteristics

The demographic and clinical characteristics of the patients were presented in Table 1. Mean age was 39.78 years (SD = 10.83). Among the patients, 75.3% were female (n = 67), 55.1% (n = 49) had a Bachelor's degree, 68.5% (N = 61) were married, 49.4% (n = 44) were employed, and 61.8% (n = 55) perceived their economic status as "moderate". Mean EDSS score of the patients was 1.51 (SD = 1.63) and mean disease duration was 7.26 years (SD = 5.49). Mean number of MS attacks experienced was 2.57 (SD = 2.52). Among the patients, 65.1% (n = 58) used immunomodulator injections.

Insert Table 1 here

Comparisons between depressed and nondepressed patients

According to the HADS cut-off criteria, 39.3% (n = 35) of the participants had significant depressive symptoms and 24.7% (n = 22) had significant anxiety. The self-esteem, self-compassion, and HRQoL scores of the depressed and nondepressed patients were compared using independent samples t-tests. Prior to these analyses, the depressed and nondepressed group were compared in terms of age, disease duration, and EDSS scores using independent samples t-test. It was found that the mean age (t (87) = 0.76, $p > 0.05$), disease duration (t (87) = 0.28, $p > 0.05$), and EDSS scores (t (87) = 0.94, $p > 0.05$) of the two groups did not show significant differences. The depressed and nondepressed patients were also compared in terms of sex using the chi-square test of independence. It was determined that there was no significant interaction between sex and depression status (x^2 (1) = 1.39, $p > 0.05$).

Depressed and nondepressed patients were compared in terms of self-esteem, self-compassion, and HRQoL using independent samples t-tests, where depression status constituted the dependent variable. As depicted in Table 2, nondepressed patients had significantly higher self-esteem (t (87) = -5.86, $p <$

0.001) and self-compassion scores (t (87) = -3.82, $p < 0.001$) compared to depressed patients. Depressed patients had significantly lower HRQoL in multiple subscales including PWB (t (87) = -5.06, $p < 0.001$), RFr (t (87) = -3.67, $p < 0.001$), RFa (t (87) = -3.91, $p < 0.001$), SSL (t (87) = -3.29, $p < 0.01$), COP (t (87) = -2.42, $p < 0.05$), and REJ (t (87) = -2.80, $p < 0.05$). On the other hand the ADL (t (87) = -1.86, $p > 0.05$), SPT (t (87) = -1.72, $p > 0.05$), and RHCS (t (87) = -1.13, $p > 0.05$) subscale scores did not differ by depression status. As for the total HRQoL (t (87) = -4.82, $p < 0.001$), physical HRQoL (t (87) = -2.09, $p < 0.05$), psychological HRQoL (t (87) = -5.48, $p < 0.001$), and social HRQoL scores (t (87) = -4.52, $p < 0.001$), depressed patients obtained significantly lower scores compared to their nondepressed counterparts.

Insert Table 2 here

Correlation analysis

Bivariate correlations between disability status, mental health, self-esteem, self-compassion, and HRQoL as well as the mean values pertaining to these variables for the entire sample were shown in Table 3. It was found that the total HRQoL score had significant positive correlations with self-esteem ($r = 0.53$, $p < 0.01$) and self-compassion ($r = 0.42$, $p < 0.01$) and had significant negative correlations with the EDSS score ($r = -0.41$, $p < 0.01$), depression ($r = -0.52$, $p < 0.01$), and anxiety ($r = -0.42$, $p < 0.01$). Physical HRQoL was significantly and positively associated with self-esteem ($r = 0.32$, $p < 0.01$) and self-compassion ($r = 0.33$, $p < 0.01$) and was significantly and negatively correlated to the EDSS score ($r = -0.59$, $p < 0.01$), depression ($r = -0.32$, $p < 0.01$), and anxiety ($r = -0.23$, $p < 0.05$). Psychological HRQoL had significant positive correlations with self-esteem ($r = 0.62$, $p < 0.01$) and self-compassion ($r = 0.52$, $p < 0.01$) and had significant negative correlation with depression ($r = -0.58$, $p < 0.01$) and anxiety ($r = -0.59$, $p < 0.01$). As for social HRQoL, significant negative correlations with depression ($r = -0.40$, $p < 0.01$) and anxiety ($r = -0.23$, $p < 0.05$) and a significant positive correlation with self-esteem ($r = 0.36$, $p < 0.01$) were found.

Insert Table 3 here

Hierarchical multiple regression analysis

Hierarchical linear regression analyses were run to determine whether the independent variables (disability status, depression, anxiety, self-esteem, and self-compassion) predicted HRQoL domains

(physical, psychological, and social HRQoL). In all three models, the EDSS score was entered in the first step of analysis, depression and anxiety were entered in Step 2, and self-esteem and self-compassion were entered in Step 3. The rationale for entering disability status and mental health indices in the first two steps of the analysis was that these factors are well-known predictors of HRQoL in the literature and therefore should be controlled for prior to examining the associations with self-esteem and self-compassion. Three separate hierarchical linear regression analyses were conducted for predicting each HRQoL domain (Table 4). According to the results, EDSS and self-compassion accounted for 48% of the total variance in physical HRQoL ($F(5, 83) = 15.36$, $p < 0.001$). The results of the hierarchical linear regression analysis conducted in order to predict psychological HRQoL showed that anxiety and self-esteem accounted for 52% of the total variance ($F(5, 83) = 18.16$, $p < 0.001$). As for social HRQoL, depression and self-esteem accounted for 21% of the total variance ($F(5, 83) = 4.36$, $p < 0.01$).

Insert Table 4 here

DISCUSSION

The main objective of the current study was to investigate the associations between HRQoL, mental health, self-esteem, and self-compassion in a sample of MS patients. The secondary aim of the study was to compare depressed and nondepressed MS patients in terms of HRQOL, self-esteem, and self-compassion. It was found that 39.3% of the sample was depressed according to the HADS cut-off point. Koçer et al found the rate of depression to be 32.3% in a Turkish sample of MS patients (56). In a meta-analysis conducted by Boeschoten et al in 2017, the rate of depression in MS patients was reported to be 30.5% (57). Our finding is slightly higher than rates found in these studies. This slight difference may be explained by methodological variations such as the assessment tools used (self-report measures vs. clinical diagnostic interviews) and the clinical features of the recruited samples (use of interferon treatment, location of MS lesions etc.).

Despite the high prevalence of depression found in the study sample, mean self-esteem and self-compassion scores were 22.88 and 90.01, respectively. These figures reflect adequate levels of self-esteem and self-compassion. Moreover, the mean total HRQoL score was found to be 74.16, which also reflects adequate levels of HRQoL. However, mean psychological HRQoL was found as 66.64, which was lower than the mean total, physical, and social HRQoL scores. This is not surprising considering the high rate of depression found in our study. The relatively adequate levels of self-esteem, self-compassion, and overall HRQOL but the high depression rate found in the study may be explained by the organic nature of depression in MS (58,59). It should also be noted that the mean disability status score of the sample was 1.51, indicating full ambulation. Taken together, these findings suggest that the overall well-being of the patients was at a moderate level, while their level of disability was relatively mild.

In the current study, MS patients were split into two groups according to the HADS cut-off criterion for depression and these two groups were compared in terms of HRQoL, self-esteem, and self-

compassion. It was expected that depressed patients would score lower in these outcome measures compared to their nondepressed counterparts. This hypothesis was confirmed as it was found that depressed patients had significantly lower overall, physical, psychological, and social HRQoL; lower self-esteem, and lower self-compassion. On the other hand, two MUSIQoL subscale scores, namely "relationships with healthcare system" (RHCS) and "activities of daily living" (ADL), did not show significant differences according to depression status. This suggested that the MS patients, regardless of their depression status, were satisfied with the healthcare they received. The current study was carried out at a single center, not allowing for large variations in the delivery of healthcare. Therefore, it can be presumed that the study site provided high quality healthcare and all patients agreed upon this, regardless of their mood status. Another possible explanation for this finding is that patients may have answered the RHCS questions in a biased way, fearing that giving negative feedback on healthcare may lead to conflict with healthcare professionals and thus negatively impact their treatment. The lack of a significant difference in ADL scores according to depression status can be explained by the fact that our sample had low levels of disability and did not have much difficulty in carrying out activities of daily living. It is thought that inclusion of MS patients with higher disability status in the sample would have produced different results, where mean ADL scores would have differed by depression status.

The finding of depressed patients having significantly lower overall, physical, psychological, and social HRQoL; lower self-esteem, and lower self-compassion is not surprising since it is known that depression is linked to deteriorations in self-views as well as in HRQoL (22,31,34,60-62). This finding suggests that improvements in HRQoL, self-esteem, and self-compassion may serve as protective factors against nonorganic depressive symptoms in MS patients. It should also be noted that although there are an abundance of studies on HRQoL and depression in MS patients (18,63-68), the same is not true for the association between self-compassion and depression. To our knowledge, the current study is the first to compare levels of self-compassion among depressed and nondepressed MS patients. As for the links between self-esteem and depression, our results confirmed that depressed MS patients have lower self-esteem than nondepressed patients, which is in line with previous studies (24,31). However, the cross-sectional design of the current study does not allow us to make inferences regarding the etiology of depression in MS. Longitudinal studies should be conducted in the future to investigate the role of low self-esteem and self-compassion in depression among MS patients.

According to the results of the correlation analyses, it was determined that total and physical HRQoL were negatively linked to disability status, depression, and anxiety; whereas they were positively associated with self-esteem and self-compassion. This finding replicated previous studies (20,21,31,48,49). Psychological HRQoL was negatively associated with mental health indices but not with disability status, while it was positively linked to self-esteem and self-compassion. It was also found that social HRQoL was positively related to self-esteem and negatively related to depression and anxiety. The association of social HRQoL to self-compassion and disability status was not significant. The lack of a relationship between psychological and social HRQoL and disability confirms that MS has two distinct influences on HRQoL: physical and psychosocial (69). Self-compassion not being related to social HRQoL contradicts previous research (43, 70). Among MS patients, social HRQoL increased with perceived self-worth or self-esteem but not with self-compassion. More research is needed in order to better understand the relationship of social HRQoL to self-compassion.

Results of the correlation analyses provided support for our regression models, where HRQoL domains were regressed on disability status, depression, anxiety, self-esteem, and self-compassion. In terms of physical HRQoL, it was hypothesized that disability status, mental health, and self-related variables will emerge as significant predictors. This hypothesis was partially supported and it was found that disability status and self-compassion significantly predicted physical HRQoL. However, the assumption that mental health indices and self-esteem also predict physical HRQoL was falsified by the findings. This result is in line with previous research which indicated that self-compassion is a better predictor of well-being compared to self-esteem since self-esteem is dependent upon self-evaluations and performance, whereas self-compassion refers to a mindful and accepting stance towards both the positive and negative aspects of the self (45). Thus, it is thought that self-compassion rather than self-esteem is more helpful in adapting to the physical challenges or shortcomings brought about by MS. On the other hand, the mean EDSS score of the study sample was low and this may have confounded the findings. In the current study, self-compassion predicted physical HRQoL in MS patients with low levels of disability but this association may not be valid for patients with advanced disability. Results obtained in this study need to be replicated in future studies in order to better understand the association of physical HRQoL to self-views, which would provide knowledge on which psychological constructs to address in interventions aiming to improve perceived physical HRQoL among MS patients.

Psychological HRQoL was significantly predicted by anxiety and self-esteem but not by disability, depression, and self-compassion. Most studies focus on depression in relation to psychological HRQoL but anxiety emerged as a stronger predictor in the current study. The ambiguous course of MS seems to create anxiety and thus reduce psychological HRQoL in MS patients (64,71,72). Based on the findings, it is suggested for mental health professionals to routinely assess the level of anxiety in MS patients as well as depression. As for social HRQoL, depression and self-esteem were found to be significant predictors. Addressing self-esteem and self-worth in psychosocial interventions designed for MS patients carry the potential to improve perceived psychological and social HRQoL.

Our findings support the assumption that an individual's psychological resources such as self-esteem and self-compassion are associated with HRQoL in MS patients. Results of the current study indicate that MS patients should be screened for depression and anxiety and their psychological resources including self-esteem and self-compassion may also be evaluated. This procedure should then include referrals of MS patients for psychotherapy in order to help them deal with the ambiguities and disability brought about by MS and reduced self-esteem. It is also known that reduced self-esteem makes an individual vulnerable to depression (73,24). Therefore, self-esteem seems to be an important factor to address in MS patients. Furthermore, based on the findings of the current study, it can be proposed that psychotherapy practices for MS patients should include both cognitive behavioural therapies which address more "traditional" factors related to mental health such as self-esteem and adaptive coping and third wave therapy programs which cultivate self-compassion, mindfulness, and acceptance. A combination of traditional cognitive behavioural and third wave therapies would prove beneficial in the case of MS since MS is a chronic and potentially disabling disease where individuals cannot always take a problem-focused or active stance in facing disease related stressors. Helping MS patients to take a mindful, compassionate, and accepting approach toward themselves by cultivating self-compassion would positively impact perceived overall and physical HRQoL.

The strengths of the present study include contributing to the literature by addressing two self-related constructs in relation to HRQoL in MS patients. Nevertheless, to our knowledge the current study is the first in comparing the associations of self-esteem and self-compassion to well-being or HRQoL in a sample of MS patients. There are also limitations to the present study including being a single-centered study and utilization of self-report measures. Another limitation of the current study was that the majority of the patients had relapsing remitting MS, which leads to not being able to generalize study findings to MS patients with a progressive course.

It may not be possible to eliminate nonresponsive MS symptoms and disability but psychological factors are modifiable through evidence-based psychosocial interventions, which may in turn lead to the promotion of HRQoL in MS patients. Findings of the current study replicated previous research findings on the role of depression and anxiety in reduced HRQoL in MS patients. In this context, routine psychiatric assessment is strongly recommended in MS populations. Healthcare professionals may help increase perceived HRQoL by addressing problems with self-esteem and self-compassion and refer patients to mental health professionals who can implement the necessary psychosocial interventions aimed at altering deteriorated self-esteem and self-compassion in MS patients. The findings of the current study provide insights to which psychosocial factors to address in improving different domains of HRQoL in MS patients. Cultivating self-compassion may increase HRQoL in the physical domain, while working with self-esteem and self-worth may improve the psychosocial domain.

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Table 1. Demographic and Clinical Characteristics of the Multiple Sclerosis Patients (*n* = 89).

Variable	Mean (*SD*)	Frequency (%)
Age (range: 20-60)	39.78 (10.83)	
Disease duration (range: 6 months-25 years)	7.26 (5.49)	
Number of children (range: 0-3)	1.07 (1.02)	
Number of Multiple Sclerosis attacks (range: 1-15)	2.57 (2.52)	
EDSS (range: 0-6.5)	1.51 (1.63)	
Gender		
Female		67 (75.3%)
Male		22 (24.7%)
Perceived income		
Poor		5 (5.6%)
Moderate		55 (61.8%)
Good		28 (31.5%)
Very good		1 (1.1%)
Educational level		
Less than high school		23 (25.8%)
High school		17 (19.1%)
Bachelor's Degree		49 (55.1%)
Marital status		
Married		61 (68.5%)
Single		19 (21.3%)
Divorced		6 (6.7%)
Widowed		3 (3.4%)
Employment		
Employed		44 (49.4%)
Unemployed		36 (40.4%)
Retired		9 (10.1%)
Treatment		
Immunomodulator injection		58 (65.1%)
Oral immunomodulator		17 (19.1%)
Immunosuppressant		4 (4.5%)
No medication		10 (11.3%)

EDSS: Expanded Disability Status Scale

Table 2. Self-Esteem, Self-Compassion and HRQoL in Depressed and Nondepressed Multiple Sclerosis Patients.

	Depressed (*N* = 35)	**Nondepressed (*N* = 54)**		
	M (*SD*)	M (*SD*)	*t* (*df* = 87)	*p*
Self-esteem	19.77 (3.76)	24.90 (4.19)	-5.86	< 0.001
Self-compassion	81.51 (16.60)	95.51 (17.08)	-3.82	< 0.001
ADL	63.83 (27.16)	74.18 (24.61)	-1.86	> 0.05
PWB	50.17 (18.53)	69.44 (16.89)	-5.06	< 0.001
SPT	72.50 (16.68)	79.28 (18.95)	-1.72	> 0.05
RFr	63.80 (27.56)	82.40 (20.13)	-3.67	< 0.001
RFa	73.33 (22.84)	90.74 (18.78)	-3.91	< 0.001
SSL	52.14 (33.55)	75.92 (33.01)	-3.29	< 0.01
COP	68.92 (23.16)	81.01 (22.87)	-2.42	< 0.05
REJ	72.14 (22.90)	84.95 (19.78)	-2.80	< 0.01

RHCS	84.28 (18.60)	89.19 (20.83)	-1.13	> 0.05
Phy. HRQoL	66.73 (21.38)	75.88 (19.33)	-2.09	< 0.05
Psy. HRQoL	55.37 (15.61)	73.95 (15.65)	-5.48	< 0.001
Soc. HRQoL	73.51 (14.10)	86.99 (13.51)	-4.52	< 0.001
Total HRQOL	66.19 (11.97)	79.33 (12.88)	-4.83	< 0.001

ADL = Activities of daily living, PWB = Psychological well-being, SPT = Symptoms, RFr = Relationships with friends, RFa = Relationships with family, SSL = Sentimental and sexual life, COP = Coping, REJ = Rejection, RHCS = Relationships with healthcare system, Phy. HRQoL = Physical health-related quality of life, Psy. HRQoL = Psychological health-related quality of life, Soc. HRQoL = Social health-related quality of life.

Table 3. Bivariate Correlations Between Scale Scores.

	2	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**M**	**SD**
1. EDSS	0.11	-0.02	-0.20	0.001	-0.59**	-0.15	-0.06	-0.41**	1.51	1.63
2. Depression	1	0.62**	-0.54**	-0.45**	-0.32**	-0.58**	-0.40**	-0.52**	5.11	4.13
3. Anxiety		1	-0.54**	-0.41**	-0.23*	-0.59**	-0.23*	-0.42**	7.32	4.46
4. Self-esteem			1	0.63**	0.32**	0.62**	0.36**	0.53**	22.88	4.73
5. Self-compassion				1	0.33**	0.52**	0.16	0.42**	90.01	18.15
6. Phy. HRQoL					1	0.47**	0.26*	0.82**	72.28	20.54
7. Psy. HRQoL						1	0.52**	0.80**	66.64	18.03
8. Soc. HRQoL							1	0.70**	81.69	15.18
9. Total HRQoL								1	74.16	14.03

EDSS: Expanded Disability Status Scale, Phy. HRQoL: Physical health-related quality of life, Psy. HRQoL: Psychological health-related quality of life, Soc. HRQoL: Social health-related quality of life. * $p < 0.05$, ** $p < 0.01$

Table 4. Hierarchical Multiple Regression Analyses for Predicting HRQoL Domains.

	R²	***ΔR²***	***ΔF***	***β* (Step 1)**	***β* (Step 2)**	***β* (Step 3)**
Dependent Variable: Physical HRQoL						
Step 1	0.34	0.34	45.75***			
EDSS				-0.59***	-0.57***	-0.60***
Step 2	0.42	0.08	5.85**			
Depression					-0.17	-0.10
Anxiety					-0.14	-0.12
Step 3	0.48	0.06	4.53*			
Self-esteem						-0.11
Self-compassion						0.31*
Dependent Variable: Psychological HRQoL						
Step 1	0.02	0.02	2.07			
EDSS				-0.15	-0.13	-0.08
Step 2	0.43	0.41	30.82***			
Depression					-0.32**	-0.19

Anxiety					-0.39***	-0.26*
Step 3	0.52	0.09	7.71**			
Self-esteem						0.26*
Self-compassion						0.15
Dependent Variable:						
Social HRQoL						
Step 1	0.004	0.004	0.31			
EDSS				-0.06	-0.01	0.05
Step 2	0.16	0.15	7.77**			
Depression					-0.41**	-0.36*
Anxiety					0.02	0.11
Step 3	0.21	0.05	2.64			
Self-esteem						0.34*
Self-compassion						-0.17

EDSS: Expanded Disability Status Scale, HRQoL: Health-related quality of life, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$