Original Article

The relationship between fatigue, self-esteem and self-efficacy in patients with multiple sclerosis

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ABSTRACT

Background: Multiple sclerosis (M.S) has been introduced as the most common causes of disability in adults, especially young persons which can be affected by various aspects such as physiological status, social interactions and beliefs. **Objectives**: With the spread of MS disease and psychosocial, psychological and cognitive changes, the self-esteem can be altered in the patient. Additionally, changes in self-esteem can shape self-efficacy. This study aimed to investigate the relationship between fatigue and self-esteem with self-efficacy in patients with multiple sclerosis (M.S). This study was a descriptive-analytic correlational research. written consent was taken from patients referred to M.S society and then the questionnaires were given to them. **Methods**: In this study, 203 patients were examined by Fatigue Severity Scale (FSS), Rosenberg's Self-Esteem Scale and Multiple sclerosis self-efficacy scale. The SPSS Statistics software (version 24.0; SPSS, Inc., Chicago, IL, USA) was employed to analyse the data in this study. **Results**: Fatigue has higher mean scores in those with lower self-esteem and lower self-efficacy. **Conclusions**: As the patient's fatigue with multiple sclerosis is higher, self-esteem and self-efficacy will be reduced. The results of this study showed that physical symptoms could have an impact on psychological issues in MS patients, so it was recommended to pay special attention to relevant problems such as self-esteem and self-efficacy in patients affected with fatigue.

Keywords: Fatigue, Multiple sclerosis (M.S), Self-efficacy, Self-esteem

Introduction

Multiple Sclerosis (MS), a chronic inflammatory disease of the central nervous system, has been introduced as the most common causes of disability in adults, especially in young people [1]. According to the relevant reports in this domain, about 2.5 million individuals all over the world are suffering from this disabling disease; therefore, it has been signified as a disease of the century [2].

As the most debilitating manifestations, fatigue has been regarded as one of the symptoms experienced by those affected with MS. The prevalence of MS-related fatigue also varies from 50 to 80% [3]. In this regard; in addition to an impact on their performance, MS-related fatigue can correspondingly hurt the quality of life in this group of patients [4]. In a study by Berger et al. (2013), 28.9% of patients reported fatigue during the first three years of diagnosis. In 40% of patients, MS-related fatigue was a premature symptom, and 38% of them experienced fatigue as the first diagnostic symptom [5]. Nevertheless, the cause of MS-Related fatigue is unknown and can be resulted from multiple conditions and can affect many factors [5] MS-related fatigue can be affected by various aspects such as physiological status, social interactions, beliefs, as well as individuals' interactions with the environment [3].

Lower levels of self-esteem have been consistently observed in patients with MS in many previous studies [6] In this respect; factors such as pain, fatigue, poor functioning of the sensory

system and the cerebellum, as well as psychosocial disorders can also reduce self-esteem [7]. With the spread of MS disease and psychosocial, psychological and cognitive changes, the self-esteem can be altered in the patient [8]. Self-esteem is the internal acceptance and credence that a person has toward himself [9] in other words, it is the value a person thinks for himself [10]. Self-esteem as an important aspect of life has not been normally evaluated [11].

Additionally, changes in self-esteem can shape self-efficacy [6]. As well, independence can be negatively influenced by individuals suffering from MS and this can consequently reduce self-efficacy [12]. Self-efficacy means one's belief in his ability to deal with different situations [9]. It can be said that self-efficacy the a confidence that a person has in doing certain behaviors and applying some changes to himself to determine whether he can apply a particular behavior or change [13]. In chronic diseases like MS, due to the unpredictable nature of the disease, self-efficacy plays a significant role in the process of disease and adaptation to disease [14]. Understanding self-efficacy can also assist nurses to develop care programs for such patients [15].

There are two types of existence gap: 1) Nurses pay attention to patients' physical problems more than their psychosocial problems of fatigue, 2) the relationship between physical symptoms (fatigue) and psychosocial symptoms (self-esteem and self-efficacy) has been ignored and it is necessary for nurses who have the closest relationship with patients to pay attention both to patients' physical and psychosocial problems and attempt to evaluate the connection between physical and psychosocial problems. Therefore, the present study is going to evaluate fatigue as a physical factor with self-esteem and self-efficacy.

Aim

The present study was to investigate the relationship between MS-related fatigue, self-esteem and self-efficacy. Moreover, given the differences in care systems and variables such as social and religious issues and considering that these patients become ill in the active ages, another aim of this study is evaluating the relationship between some of the demographic data with fatigue, self-esteem and self-efficacy in MS patients.

Design

Sampling has been done after receiving ethical code, necessary permissions, getting authorization from society, administrations and explaining study goals. After explaining study goals for patients with inclusion criteria, written consent was taken and then the questionnaires were given to them. Since there was a potential lack of patient collaboration to participate in the present study, the convenience sampling method was used.

Method

This study was descriptive-analytic correlational research wherein the relationship between fatigue, self-esteem, and self-efficacy in MS patients was evaluated between May and July 2018. Before evaluating based on inclusion criteria, decisive MS diagnosis considering given information by doctors about patient according to McDonald Scale was evaluated. The patients with a definitive diagnosis in the medical record were examined for inclusion criteria.

Inclusion Criteria

It is essential to be mentioned that all types of MS patients (primary progressive, secondary progressive, relapsing-remitting, progressive relapsing) have been used. Patients aged over 20 and at least one year of being infected with MS were recruited in this study. Moreover, individuals able to communicate with a stable clinical state i.e. no evidence of acute and chronic infectious and malignant diseases were included. Besides, such patients had no history of psychosocial illnesses such as anxiety and depression. Patients have been asked self-reporting about having or not having depression experience and using anti-depression drugs for 6 months. In this respect, individuals obtaining scores of 3.5 and higher from the EDSS were recruited. EDSS was extracted from the patients' files. It should be noted that patients with acute onset of the disease during the study were excluded from this study.

Ethical Considerations

This study was approved by the Ethics Committee of the University on January, 31 2018. The patients also completed the questionnaires after signing the written consent form. Moreover, oral satisfaction was received from the given patients whose participation in the present study was completely voluntary. It should be noted that patient information was provided only to the research team and it was used merely for scientific purposes. To prevent the disclosure of patient information, several codes were used for each questionnaire instead of their full names.

Setting

This study was conducted among patients with MS referring to the Iran National Multiple Sclerosis Society in Tehran. To this end; patients attending sports practices, undergoing physiotherapy, performing administrative affairs, and also those referring to physicians for visits were recruited in this study.

Sampling Process

Given the sample size formula for correlational studies and concerning to type -I error correlation of 5% ($\alpha=0.05$), type-II error test by 10%, test power of 90%, as well as the correlation coefficient of 0.2; the sample size was calculated by 184 individuals [16]. According to the inclusion criteria and

considering 10% sample loss, a total number of 203 individuals were selected by the Convenience sampling method for this study.

Measurement

Using a demographic characteristics form; information on age, gender, marital status, level of education, age of onset, and length of time from diagnosis were obtained from the patients.

Fatigue Severity Scale (FSS) developed by Krupp et al. (1989) was used to evaluate patients' levels of fatigue. This 9-item questionnaire used in most medical research could measure individuals' perceptions of their levels of fatigue. The minimum scores and also maximum scores from this questionnaire were 9 and 63; respectively [17].

Shahvaroghli-Farahani et al. (2009) obtained the internal consistency of the questionnaire items by 0.96 via calculating the Cronbach's alpha coefficient. The intra-class correlation coefficient (ICC) was also performed by 0.93 [18].

Moreover; Rosenberg's Self-Esteem Scale (RSES) (1965) was employed to determine self-esteem. This questionnaire contained 10 items including 5 positive (items no. 1-5) and 5 negative items (items no. 6-10) using a four-point Likert-type scale. The minimum and maximum scores from this questionnaire were 0 and 30; respectively. In this respect, higher scores indicated higher levels of self-esteem.

Rajabi and Bohlol (2007) reported that it had high construct validity. Considering the reliability, correlation coefficients between each scale item and the score for all the items also varied from 0.56 to 0.72. Cronbach's alpha coefficient for the entire questionnaire was reported by 0.93 in the Persian version of the questionnaire [19].

Multiple Sclerosis Self-Efficacy Scale (MSSS) developed by Rigby et al. [20] was also used to evaluate self-efficacy in patients. This scale had been designed for adults and contained 11 items and 3 components measuring activity and independence (4 items), concerns and interests (3 items), and personal control (3 items). This scale was also scored using a five-point Likert-type scale. Among the questionnaire items; items no. 4, 9, 10 and 11 were scored in reverse. It should be noted that the scores ranged from 11 to 55 and higher scores could mean higher levels of self-efficacy.

In the study by Tanhay Rashvanlou and Soleimanian (2014) , the construct validity of the questionnaire was reported desirable and the Cronbach's alpha coefficient of the entire questionnaire was reported by 0.90 [21].

Data Analysis

The SPSS Statistics software (version 24.0; SPSS, Inc., Chicago, IL, USA) was employed to analyze the data in this study. Questionnaires with missing data were substituted by other questionnaires. In this respect, the total score of each instrument was calculated by summarizing the scores of each item for each questionnaire. Then, an independent-samples t-test was used to examine the relationship between fatigue, self-esteem, and self-efficacy and gender in patients. In addition, analysis of variance (ANOVA) was utilized to investigate the relationship between fatigue, self-esteem, and self-efficacy and employment status, marital status, and length of time from diagnosis. Pearson's correlation coefficient was also employed to shed light on the relationship between fatigue, self-esteem, and self-efficacy and age and age of onset of the disease. Moreover, Spearman's rank-order correlation was used to measure the relationship between fatigue, self-esteem and self-efficacy and levels of education. Then, a linear regression model was employed to investigate the correlation between fatigue, self-esteem, and self-efficacy. A p-value of less than 0.05 was considered as a significant level.

Interpretation of Results

In this study, a total number of 203 MS patients meeting the inclusion criteria were recruited. The mean age was 36.7 ± 9.00 years and the mean age at the onset of disease was 28.7 ± 8.2 years. Further, 82.3% had a history of hospitalization due to MS, of which the mean number of admissions was 4.12 ± 2.99. Among the participants in the study, 81.8% introduced a family member as a supporter, among whom 28.4% identified two members of the family as supporters and 28.1% of the people with the highest frequency considered spouses and then 12.3% introduced their mothers as supporters. Other demographic data were illustrated in Table 1.

Table 1: Demographic Information in M.S Patients (n= 203).

Variables	Percent (%)	Variables	Percent (%)
Gender		Educational status	
Men	31	Under diploma	13.3
Women	69	Diploma	38.9
Marital Status		Associate Degree	9.9
Single	36.5	BA	27.1
Married	53.2	MA	10.3
Divorced	8.4	PhD	0.5
Partner Died	2	Monthly income	
Employment Status		Enough	36.5
Student	4.9	Inadequate	63.5
House Wife	39.4	Costs of treatment	
Employee	11.8	Low	5.4

Out of Service	5.9	Moderate	23.2
Unemployed	18.2	High	58.2
Self-employment	19.7	Without problem with insurance	13.3
Duration of Diagnosis		Direct caregiver	
1-5 Years	46.3	Partner	34
6-10 Years	23.2	Patient	31.5
More than 10 Years	30.5	Child	3.9
History of the Disease in Family		Father	2.5
Yes	13.8	Mother	13.3
No	86.2	More than one	14.9
Hospitalization History		Referred to the physician	1
Yes	82.3	Every week	0.5
No	17.7	Every month	20.2
Access to Medication		Every 3 month	34.5
With problem	33.5	Every 6 month	21.7
Without problem	66.5	If needed	20.2
Exercise		Others	2
Yes		Disorder in organs	
No		Sensory	42.9
Communication with the association		Motor	38.4
Yes	74.9	Both	17.7
No	25.1		
Family support			
Yes	81.8		
No	18.2		

The mean scores of fatigue and self-esteem were 38.1±14.4 and 19±7.6; respectively. This value was also equal to 39.6±9.1 for self-efficacy. Moreover, 59.5% and 48.7% of the study participants obtained moderate mean scores of fatigue and moderate mean scores of self-esteem; respectively.

Based on the results of this study, a significant relationship was observed between levels of education and fatigue (p=0.034, r=-0.149), self-esteem (p=0.008, r=0.18), and self-efficacy (p=0.019, r=0.16). The results of the correlation between other demographic characteristics and fatigue, self-esteem, and self-efficacy were illustrated in Tables 2 and 3.

Table 2: The Association between Demographic Data, Fatigue, Self-esteem and Self-efficacy					
Variables	Fatigue		Self-esteem		Self-efficacy	
	M (SD)	P-value	M (SD)	P-value	M (SD)	P-value
Gender		0.28		0.98		0.25
Men	39.73 (15.0)		19.01 (6.84)		38.53 (9.03)	
Women	37.37(14.14)		19.04 (8.0)		40.12 (9.21)	
Marital status		0.29		0.089		0.27
Single	37.85(14.21)		18.89 (7.86)		39.0 (9.02)	
Married	37.91(14.29)		19.84 (7.27)		40.59 (8.77)	
Divorced	37.17(16.21)		14.82 (8.6)		37.58(11.42)	
Partner died	51.75(11.87)		17.75 (4.85)		34.0 (11.04)	
Employment status		0.094		0.03*		0.01*
Student	34.0 (13.73)		19.1 (7.79)		41.6 (7.87)	
House wife	37.86(13.48)		18.60 (7.79)		39.35 (9.51)	
Employee	36.50(17.21)		22.7 (7.87)		43.87 (8.90)	
out of service	49.66(14.88)		14.33 (7.49)		33.58 (7.94)	
unemployed	38.67(14.57)		17.94 (7.79)		37.4 (9.88)	
self-employment	36.6 (13.49)		20.1 (6.22)		41.02 (7.25)	
Duration of diagnosis		0.34		0.54		0.49
1-5 years	36.52(13.66)		20.39 (6.75)		41.31 (8.51)	
6-10 years	39.19(14.65)		17.4 (8.99)		38.38(10.58)	
More than 10 years	39.69(15.31)		18.2 (7.58)		38.01 (8.65)	
History of the disease in family		0.025*		0.42		0.025*
Yes	43.75(15.67)		17.96 (9.29)		36/03 (8.01)	
No	37.20(14.04)		19.2 (7.36)		9.23 (40/2)	
Hospitalization history		0.23		0.21		0.38
Yes	38.67 (14.6)		18.72 (7.79)		39.37 (9.27)	
No	35.5 (13.38)		20.47 (6.83)		40.83 (8.68)	
Monthly income		0.002*		< 0.001*		< 0.001*

Enough	34.09(13.27)		21.63 (6.17)		42.78 (8.02)
Inadequate	40.53(14.51)		17.48 (7.99)		37.79 (9.33)
Exercise		0.023*		0.003*	< 0.001*
Yes	36.48(14.15)		20.17 (7.43)		41.29 (8.58)
No	41.33 (14/5)		16.77 (7/6)		36.32 (9.45)
Family Support		0.15		< 0.001*	0.002*
Yes	37.42(14.19)		19.93 (6.97)		40.57 (8.3)
No	41.18(15.21)		15.0 (9.21)		35.4 (11.53)

a Obtained from Independent Sample t-test or Analysis of Variance (ANOVA)
*P-value less than 0.05

Table 3: Correlation between Age, the Age of the disease onset, Number of Admissions with Fatigue, Self-esteem and Self-efficacy

Variables	Min	Max	M (SD)	fatigue		Self-esteem		Self-efficacy	
				r	P-value[a]	r	P-value	r	P-value
Age (year)	20	64	36.7 (9.02)	0.05	0.45	-0.03	0.64	-0.008	0.91
The age of the disease onset	12	61	28.7 (8.27)	-0.51	0.47	0.48	0.49	0.076	0.28
Number of admissions	1	40	2.99 (4.12)	0.26	0.001*	-0.24	0.002*	-0.23	0.003*

a Obtained from Pearson Correlation
*P-value Less than 0.05

The results of the correlation of fatigue, self-esteem, and self-efficacy in patients with MS were presented in Table 4. The results of the linear regression model also showed a significant and inverse relationship between fatigue and self-esteem. Accordingly, the mean score of self-esteem decreased by 0.147 (β=-0.147) as the fatigue score increased by one unit.

Moreover, there was a significant and inverse correlation between fatigue and self-efficacy in a way that increased fatigue score by one unit could reduce the mean score of self-efficacy by 0.2 (β=-0.204).

Table 4: Linear Regression for the Association between Fatigue, Self-esteem and Self-efficacy

Variables	β (95% CI)	P-value[a]
Fatigue and Self-esteem	-0.37	< 0.001*
Fatigue and Self-efficacy	-0.42	< 0.001*
Self-esteem and Self-efficacy	0.8	< 0.001*
Fatigue and Independence and Activity Gamut	-0.38	< 0.001*
Fatigue and Personal Control Gamut	-0.28	< 0.001*
Fatigue and Concerns Gamut	-0.4	< 0.001*

a Obtained from Linear Regression. *P-value Less than 0.05

Discussion

The purpose of the present study was to examine the correlation between fatigue and self-esteem and self-efficacy in patients affected with MS.

It should be noted that fatigue is considered the most common symptom in patients with MS [22] Such individuals also know it as an uncontrollable disease that can change their self-esteem as well as their self-management and finally affect the disease outcomes such as fatigue [14].

The results of this study showed that a rising trend in levels of education had increased the mean scores of self-esteem and self-efficacy in MS patients. The findings in the investigation by Zendehtalab and Norouzi [23], Sharifi Neystanak et al. [8], and Masoodi et al. [24] also revealed a significant relationship between self-esteem and levels of education. So, the ability to deal with the complications of an illness particularly in chronic diseases had

improved as the levels of education had become higher [23] and consequently disease knowledge and self-management had been boosted [25]. In conflict with the results of the present study, Daniali et al. [26] found no difference between levels of education in MS patients and their self-efficacy and knowledge.

The results of this study correspondingly revealed a significant relationship between employment status and levels of self-esteem and self-efficacy. In this respect, Zendehtalab and Norouzi [23] reported similar findings, but Masoodi et al. [27] found no significant relationship between employment status and self-esteem. However, according to the results of the present study, it was assumed that employment status and social engagement could lessen social isolation and depression in a person, and they could further help in maintaining self-esteem in the event of the disease [23]. Additionally, Jongen et al. [28] reported low levels of self-efficacy in patients with MS who had reduced their working hours [29].

More fatigue was also observed in individuals who had been frequently hospitalized. In the study by Ghanbari et al. [30] in patients with chronic obstructive pulmonary disease, similar results were also reported.

In the present study, low levels of self-esteem and self-efficacy were found in individuals who had been more hospitalized. ZendehTalab and Norouzi (2014) also obtained similar results. It looks as if MS as a chronic disease may have devastating effects on various aspects of individual, familial, social, and occupational life [23].

A significant relationship was similarly found between self-esteem and levels of income in the present study. But, the results of the investigations by Sharifi Neystanak et al. [8] and Masoodi et al. [24] did not confirm these findings. It is assumed when individuals gain insufficient income to meet living and therapeutic expenses, they feel they have no ability to overcome the disease and they may even discontinue treatments for financial reasons.

More fatigue was also reported in individuals with a family history of MS. The results of this study showed that less than one-fifth of the participants had a family history of MS. Sharifi Neystanak et al. [8] similarly found that one-fifth of the participants in their study had a history of MS in their family. So, such individuals were endowed with enough knowledge and familiarity with the complications and problems caused by such a disease and also awareness of unknown prognosis of such a disease, and could experience more mental fatigue than those with no family history of the disease.

Moreover, higher levels of self-efficacy were observed in individuals with no family history of the disease. Although no study had been conducted in this regard on patients with MS, Tol et al. [31] found no significant relationship between family history of diabetes and perceived self-efficacy in their investigation on patients with type 2 diabetes. Perhaps another reason is that perceived compatible self-esteem was evaluated while in the present study, special self-esteem questionnaire for M.S patients were used. It was concluded that someone who does not have a chronic disease such as MS can do their best like other family members to cope with the problems particularly those induced by the disease.

The results of the linear regression model revealed a significant relationship between exercise and fatigue. In the study by Negaresh et al. (2018), the findings showed that exercise could have positive effects on mitigating levels of fatigue and depression in patients with MS [32]. Individuals with low and moderate levels of fatigue were also likely those having fewer physical abilities and able to perform exercises well [25]. Therefore, it was decided that sports can affect the levels of fatigue [33].

A significant relationship was also observed between exercise and self-esteem and self-efficacy in the present study. According to the results of the investigation by Awick et al. (2017), there was a correlation between physical activity, self-efficacy, physical self-esteem, and general self-esteem. In this respect;

self-efficacy could affect self-esteem in adults if it was fulfilled following physical activity [34].

In this study, the individuals supported by their families reported higher levels of self-esteem and self-efficacy. In this respect, Ifantopoulou et al. [11] stated that appropriate social support for these patients could protect them against psychological difficulties caused by low self-esteem. To support patients suffering from MS to use different methods to become compatible with the disease in terms of MS management; family, caregivers, and friends can play important roles [35]. In line with the present study, Motl et al. (2013) reiterated that one of the most influential factors promoting self-efficacy was social support alongside self-management of emotional situations, experiences, and symptoms of diseases [36].

The results of this study showed that higher fatigue scores could lead to lower self-esteem ones and vice versa. In this regard, Ifantopoulou et al. [11] and Fragoso et al. [37] stated that fatigue and self-esteem in MS patients were correlated. It should be noted that self-esteem was found as an important psychological factor affecting fatigue in MS patients in the present study.

On the other hand, changes in fatigue can also affect self-efficacy [6]. The results of this study demonstrated that higher fatigue scores could reduce self-efficacy obtained by an individual and vice versa. In the case of chronic diseases such as MS and given the unpredictable nature of the disease, self-efficacy could also play a significant role in disease progression as well as compatibility with the disease [14]. In this respect, lower self-efficacy could diminish motivation to work and perform tasks [13]. In chronic diseases such as rheumatoid arthritis, self-efficacy has been similarly introduced as a factor affecting patients' levels of fatigue [14]. Moreover, Jongen et al. (2014) observed more fatigue and lower levels of self-efficacy in patients who had reduced their working hours during the year after diagnosis [28]. Asea et al. [38] and Amtmann et al. [39] similarly reported that individuals with more self-efficacy had experienced less depression, anxiety, and fatigue; and consequently more self-management [38]. It seems that a rise in physical activity was likely to augment self-efficacy in an individual about their abilities particularly their autonomy; as a result, there will be an ascending trend in self-efficacy and a reduction in mental and physical fatigue.

The results of this study showed a significant and direct relationship between self-esteem and self-efficacy. In this regard, higher self-esteem scores could lead to an increase in self-efficacy scores and vice versa. Accordingly, Mikula et al. (2018) reported that general self-efficacy was correlated with self-esteem in different chronic situations, so it was related to the ability to use appropriate compatibility strategies in different situations [35]. Unlike the results of the present study, Uccelli et al. (2016) did not find a significant relationship between self-esteem and self-efficacy. This had been probably caused by the small sample size in the study (n=89) [40]. The investigation by Geyh et al. (2012) on patients with spinal cord injury also showed that self-esteem and self-efficacy in such individuals

were strongly correlated [41]. It seems that individuals facing chronic diseases can boost their compatibility and also improve their sense of self-worth and ability to fight them; hence, self-esteem and self-efficacy in the case of the mentioned chronic diseases could be directly correlated.

Based on the results of the present study, a significant and inverse relationship was observed between fatigue and self-esteem as well as self-efficacy, so that self-esteem and self-efficacy could be reduced in a person as there was an increase in their levels of fatigue.

Since self-esteem and self-efficacy have been considered as two important strategies to become compatible with a disease in a person and given the results of this study, a significant relationship was found between fatigue, self-esteem, and self-efficacy. Accordingly, there is a need to pay much attention to the incidence and the risk factors exacerbating fatigue in these patients. It seems that augmented levels of self-efficacy and self-esteem affect an individual's compatibility with disease and also help them to seek strategies to increase their physical ability and reduce their fatigue. In addition, a person endowed with high self-esteem tries to overcome fatigue, continue previous activities, and maintain self-efficacy at levels similar to those before to the disease. A person with high self-esteem also makes attempts to preserve one's individual and social roles at a level in line with that existing before the disease and overcome fatigue as a healthy person and continue one's activities. Notably, no research was found in line with the purpose of this study in MS patients. Therefore, it was recommended to evaluate the existing variables in different populations and larger sample sizes and also shed light on their relationships.

Limitations

Among the limitations of the present study was the time-consuming completion of the questionnaires. Considering that there were numerous items in the questionnaire and the patients felt fatigued as they completed them, they were granted enough time to rest and then got involved in the completion of the questionnaires. Another limitation is the high non-generalizability due to participating only M.S society participants and not patients attending other clinics or hospitals.

Implications for Nursing Policy

It is hoped that the results of the present study can be used by authorities and planners to improve the quality of life in MS patients. Moreover, it is expected that the findings are of use in terms of taking measures in order to reduce fatigue and increase self-efficacy in patients affected with MS in their individual and social life. In addition; attention to personal beliefs which is assumed to be effective in coping with the disease is of utmost importance.

Furthermore; nurses are among those who spend more time in close contact with patients, so they can point out fatigue and its related factors in patients and also make attempts to eliminate or reduce them. In this respect, they can improve self-esteem and self-efficacy and consequently reduce fatigue in their patients. In addition, increasing self-esteem and self-efficacy in patients can strengthen their compatibility with the disease and their treatment adherence. It seems that when fatigue can be adjusted, its influences on self-esteem and self-efficacy will be decreased. Inspiring patients to adhere to treatments and have regular visits can also help in preventing recurrences, lowering levels of fatigue, and improving self-esteem and self-efficacy. Moreover, it was recommended to teach the strategies for having compatibility with the disease to patients and their family members particularly in patients with a family history of the disease to diminish their levels of fatigue and increase their self-efficacy.

Given that the role of a supportive person in developing self-esteem and self-efficacy in MS patients was highlighted in this study, it was recommended to provide the required training not only to patients but also to their family members, especially someone with a close emotional bond with the patients.

Conclusion

Various physical and emotional factors can influence the levels of fatigue including self-esteem and self-efficacy. Accordingly, nurses are required to focus on their patients' levels of fatigue and make attempts to correct them.

The results of this study showed that physical symptoms could have an impact on psychological issues in MS patients, so it was recommended to pay special attention to relevant problems such as self-esteem and self-efficacy in patients affected with fatigue. Therefore, authorities in healthcare centers and societies for MS patients are recommended to hold skills training workshops, especially for increasing self-esteem and self-efficacy among these individuals.

Acknowledgment

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