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Title: The Relationship between Spiritual Health, and the Levels of Fatigue and Depression in People with Multiple Sclerosis

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Abstract:

Background: Multiple sclerosis represents the most prevalent progressive neurological disorder among young individuals globally. Patients diagnosed with this condition often experience a diverse array of psychological challenges. The current study sought to explore the correlation between spiritual well-being and the levels of fatigue and depression in individuals with multiple sclerosis who referred to the Tehran multiple sclerosis (MS) Association in 2024.

Methods: This research employed a cross-sectional, descriptive-correlational design. The statistical population comprised individuals diagnosed with multiple sclerosis (MS) who sought assistance from the Tehran MS Association. From this population, 200 participants were selected through continuous sampling in accordance with established inclusion criteria. Data collection instruments included a demographic and disease characteristics questionnaire, the Fatigue Severity Scale (FSS), the Beck Depression Inventory II (BDI-II), and the Paloutzian and Ellison Spiritual Well-Being Scale (SWBS). The analysis of the data was conducted using SPSS version 27, employing both descriptive and inferential statistical methods, including Pearson's correlation coefficient, independent t-tests, and analysis of variance (ANOVA). The significance threshold for all tests is established at $p<0.05$.

Results: The results indicated that the average total score of fatigue, depression, and spiritual health among the participants was 48.33 (SD= 14.52), 19.11 (SD= 13.04), and 92.41 (SD= 25.09), respectively. Statistical analysis revealed a significant negative correlation between fatigue and spiritual health ($r=-0.294$, $p<0.001$). Additionally, a significant negative correlation was found between depression and spiritual health ($r=-0.650$, $p<0.001$).

Conclusion: The results of this study indicate that there exists an inverse relationship between spiritual well-being and the prevalent issues of fatigue and depression among individuals diagnosed with MS. Consequently, it is advisable to incorporate strategies that focus on enhancing spiritual well-being, as this may significantly alleviate the mental health challenges faced by these individuals.

Keywords: Spiritual health, Fatigue, Depression, Multiple sclerosis, Quality of life

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Highlights

- MS impacts the central nervous system, leading to a range of physical and psychological difficulties.
- Individuals with MS frequently experience fatigue and depression, which can reduce their quality of life.

- The results indicated a statistically significant negative correlation between fatigue and spiritual well-being.
- The results also indicated a statistically significant negative correlation between depression and spiritual health.

Plain language summary

Multiple sclerosis (MS) is a prevalent condition affecting the central nervous system, and manifests with a variety of physical symptoms such as limb paralysis, numbness, visual disturbances, double vision, bladder issues, and dizziness. Additionally, this condition is often associated with psychological challenges, with fatigue and depression being the most frequently observed. Conversely, spiritual health, recognized as a vital aspect of overall well-being, can enhance patients' resilience, particularly during challenging times. The findings of this study indicate a relationship between spiritual health and the levels of fatigue and depression experienced by these patients, suggesting that an increase in spiritual health is linked to a decrease in both fatigue and depression.

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Introduction:

Multiple sclerosis (MS) is a chronic inflammatory disorder impacting the central nervous system, marked by demyelination and axonal degeneration (Faissner et al., 2019). It is the most prevalent inflammatory and demyelinating disorder affecting the central nervous system (Kuhlmann et al., 2023) and is acknowledged as the leading progressive neurological condition among young individuals worldwide. Research conducted in the United States revealed a 2.3% annual rise in the prevalence of MS from 2010 to 2017 (Wallin et al., 2019). Presently, MS affects about 2.5 million people globally, posing considerable challenges for individuals and society (Cantoni et al., 2022). A systematic review and meta-analysis in Iran estimated the MS prevalence at approximately 100 cases per 10,000 individuals (Mirmosayyeb et al., 2022). There exist four classifications of MS: relapsing-progressive, primary progressive, relapsing-remitting, and secondary progressive. Among these, relapsing-remitting multiple sclerosis (RRMS) is the predominant variant, impacting 85 percent of individuals diagnosed with the condition. MS patients encounter a range of symptoms, with the most prevalent including visual disturbances, fatigue, and muscle spasms. Furthermore, it is not uncommon for MS to occur with additional health issues such as anxiety, depression, and sleep problems (Muñoz-Jurado et al., 2022). Fatigue and depression are especially common among individuals with MS (Tarasiuk et al., 2022).

Fatigue, defined as profound tiredness, is prevalent in neurological disorders. Its high occurrence significantly impacts daily life and quality of life (QOL), contributing to early retirement (Penner and Paul, 2017). Studies reveal that fatigue affects 35% to 97% of MS patients (Tarasiuk et al., 2022). The American MS Society defined fatigue as a subjective lack of energy for usual activities (Guidelines, 1998). Fatigue in MS is divided into physical and cognitive types (Tarasiuk et al., 2022). Physical fatigue hinders mobility and balance. Furthermore, fatigue correlates with reduced cognitive function, lower work efficiency, psychological issues, and decreased social skills (Cortés-Pérez et al., 2021). Individuals with MS not only experience fatigue but are also at an elevated risk for developing depression (Kowalec et al., 2023). Depression is a critical health concern that can become chronic, negatively affecting QOL. Those with depression often experience severe symptoms such as fatigue, insomnia, and hopelessness (Fukai et al., 2020). The incidence of depressive disorders is high in MS patients, hindering their QOL and treatment adherence. This incidence escalates with disease progression, especially in the secondary progressive phase of MS (Solaro et al., 2018). The lifetime prevalence of depression in patients with MS has been reported to be between 40 and 50% (Wenger and Calabrese, 2021). The relationship between fatigue and depression in MS is complex, with fatigue occurring independently or as a depressive symptom. Typically, fatigue and depression are correlated, and treating depression may alleviate fatigue (Feinstein et al., 2014). Various models exist for managing the challenges of chronic diseases, one of the most important of which is spiritual health (Shahabian et al., 2020).

Physical, psychological, social, and spiritual dimensions of human existence affect their lifestyle and QOL (Abdekhodaie et al., 2018). A comprehensive healthy lifestyle includes six

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essential components: physical activity, nutrition, health responsibility, spiritual growth, interpersonal relationships, and stress management. Prioritizing spiritual health can enhance one's QOL. Studies show that spiritual health and spirituality are vital in improving QOL and mitigating symptoms of chronic health issues (Jafari and Saberi, 2022). Spirituality provides a framework for individuals to find meaning in their experiences, promoting feelings of completeness, hope, and tranquility despite life's challenges (Shi et al., 2023). Spiritual health is essential in confronting life's challenges, encompassing both existential and religious aspects. Religious health is related to the fulfillment from connecting with a higher power, while existential health seeks to understand life's meaning and purpose (Sharifian et al., 2020). Numerous patients view spiritual health as crucial for instilling purpose and significance in their lives, thereby improving their QOL (Shahabian et al., 2020).

Spiritual health significantly influences overall well-being and the management of medical conditions. This interaction is reciprocal; certain health issues can adversely affect spiritual health. Studies reveal that spiritual care correlates with improved health outcomes and QOL , potentially enhancing resilience against mental health disorders (Sytsma et al., 2020). For instance, research indicates that young cancer patients experiencing anxiety, depression, or fatigue report lower levels of meaning, peace, and perceived divine presence in daily life (Grossoehme et al., 2020). Furthermore, a positive relationship exists between spiritual health and self-esteem in women with multiple sclerosis (Shaygannejad and Mohamadirizi, 2020). Additional studies on MS patients indicate that spiritual health is associated with better QOL and diminished death anxiety (Allahbakhshian et al., 2010 ; Mohammadizadeh et al., 2017). In diabetic populations, higher spiritual health correlates with reduced depression rates (Soudagar and Rambod, 2017). Similarly, patients with acute coronary syndrome who report elevated spiritual health demonstrate lower anxiety, depression, and stress levels (Afra and Zaheri, 2017). In cancer patients undergoing treatment, a negative relationship was identified between spiritual health and fatigue (Lewis et al., 2014).

Despite previous studies providing useful insights, research linking spiritual health and depression in multiple sclerosis patients remains limited. Additionally, the relationship between spiritual health and fatigue in this demographic has not been examined. Thus, the present study aims to evaluate fatigue, depression, and spiritual health levels in MS patients and to investigate the correlations between spiritual health, and levels of fatigue and depression in these patients.

Materials and methods

Design, setting and sample

This study utilized a cross-sectional, descriptive-correlational design. Individuals with MS were selected via continuous sampling from the Tehran MS Association. In order to determine the required sample size with a 95% confidence level and 80% statistical power, assuming that the correlation coefficient between spiritual health and fatigue and depression is not less than 0.2 (which indicates that the relationship between these two variables is statistically significant),

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the minimum sample size was estimated to be 200 people using the following formula.

$$n = \frac{(z_{1-\alpha/2} + z_{1-\beta})^2}{w^2} + 3$$

The requirements for participation in the study included being at least 18 years old, confirmed MS diagnosis for at least 6 months, being fluent in Persian, not reporting any mental health disorders, and having a score of 7 or less on the Expanded Disability Status Scale (EDSS) (this tool was used only for sample inclusion). EDSS was developed by neurologist Kurtzke in 1983 to assess the severity of physical disability and incapacity in patients suffering from MS. It evaluates disability across eight functional systems: vision, sensory, urinary-excretory, brain, brainstem, cerebellum, and pyramidal tracts. The score obtained can range from 0, which indicates a normal state with no physical problems or disorders affecting the functioning of the system, to 10, which indicates death, and the score obtained can include decimals of 0.5. For example, a score of 5.5 indicates that the patient is able to walk approximately 100 meters without assistance or the need to rest (Khosravi et al., 2023).

Data collection instruments

The study utilized a demographic and disease characteristics questionnaire, the Fatigue Severity Scale (FSS), the Beck Depression Inventory II (BDI-II), and the Paloutzian and Ellison Spiritual Health Questionnaire (SWBS).

The demographic form collected data on variables including age, gender, educational level, marital status, employment, and the type and duration of MS.

FSS developed by Krupp et al. in 1989, measures fatigue in chronic conditions like MS and lupus. It consists of nine items rated on a 7-point Likert scale (From 1= strongly disagree to 7= strongly agree), with scores ranging from 9 to 63, where scores below 36 suggest no fatigue and scores of 36 or higher warrant further medical assessment (Krupp et al., 1989 ; Safajou et al., 2020). A study on MS patients reported a Cronbach's alpha coefficient of 0.81 (Krupp et al., 1989). The Persian adaptation of the scale demonstrated strong validity and reliability, with a Cronbach's alpha of 0.96 and an intraclass correlation coefficient (ICC) of 0.93 (Shahvaroughi-Farahani et al., 2013).

BDI-II is a widely utilized self-report instrument comprising 21 items to evaluate depressive symptoms in adolescents and adults. Revised in 1996, it aligns with DSM-IV depression criteria and asks respondents to reflect on experiences over two weeks, differing from the original one-week period (Beck et al., 1996). Each item is scored from 0 to 3, yielding a total score from 0 to 63, interpreted as follows: 0-13 indicates minor depression, 14-19 mild depression, 20-28 moderate depression, and 29-63 severe depression. Completing the inventory typically takes 5 to 10 minutes (Sharifi et al., 2019 ; Badiee Aval et al., 2020). Research by Hamidi et al. confirmed

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the BDI II's strong validity and reliability among elderly Iranians, with a Cronbach's alpha of 0.93 and an ICC of 0.81 (Hamidi et al., 2015).

SWBS is a self-administered scale with 20-items divided into two subscales. The Religious Well-Being Subscale (RWBS) evaluates the spiritual verticality through 10 items focused on the concept of God. Conversely, the Existential Well-Being Subscale (EWBS) assesses horizontal dimensions of well-being through 10 items related to life purpose and satisfaction (Bufford et al., 1991). Responses on the SWBS are rated from 1 to 6, yielding a cumulative score between 20 and 120. Positive items are designated by specific numbers, with “strongly agree” scoring 6 and “strongly disagree” scoring 1. Conversely, negative items are scored inversely, wherein “strongly agree” receives a score of 1 and “strongly disagree” a score of 6. The overall spiritual health score results from the sum of both positive and negative item scores: scores between 20 and 40 indicate low spiritual health, 41 to 99 indicate moderate, and 100 to 120 indicate high spiritual health (Paloutzian and Ellison, 1991). The Persian version of the scale has demonstrated reliability, with a reported Cronbach’s alpha coefficient of 0.82 (Allahbakhshian et al., 2010).

The study's questionnaires were validated and assessed for content by four distinguished faculty members from the School of Nursing and Midwifery at Iran University of Medical Sciences, including a PhD in Psychiatric Nursing. Additionally, the reliability of these instruments was examined using a sample of 30 individuals similar to the study participants. The resulting Cronbach's alpha coefficients were 0.857 for the FSS, 0.885 for the BDI II, and 0.943 for the SWBS.

Procedure

After obtaining Ethics approval, the researcher secured an introduction letter from the Vice President for Research at Iran University of Medical Sciences. Coordination was made with the officials of the Tehran MS Association and the study objectives and methods were communicated to them. The researcher then sampled participants from the target population while adhering to inclusion criteria. The research instruments were distributed to the participants in a controlled environment and in the presence of the researcher. The questionnaires took 30 to 40 minutes to complete. For participants facing challenges like illiteracy or disabilities, the researcher read questions aloud and recorded responses directly.

Data analysis

Data analysis was conducted utilizing SPSS version 27 software. Frequency distribution tables were employed for qualitative variables, while numerical indices such as minimum, maximum, mean, and standard deviation were applied to quantitative variables. Pearson's correlation coefficient was utilized to investigate the correlation between spiritual health and both fatigue and depression variables. Additionally, independent t-tests and analysis of variance were implemented to explore the relationship between demographic variables and main variables. Also in the variance analysis test, Tukey's comparison method was employed to conduct pairwise comparisons. The significance level for all tests was set at $p<0.05$.

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Results

The study comprised 200 individuals with MS, predominantly female at 69.5%. The age of the subjects ranged from 18 to 72 years, with a mean age of 42.63±10.77. A notable 54% of participants had university-level education. Regarding marital status, 64.5% were married. Over half (55%) were unemployed. Additionally, 43.5% were unaware of their specific type of multiple sclerosis, though the relapsing-remitting type was most common at 28%. The average disease duration was 137.25 months, with a standard deviation of 104.87 months. Detailed demographic and clinical characteristics of the subjects are presented in Table 1. As illustrated in Table 1, a statistically significant association was observed between depression and employment status, revealing that depression levels were considerably lower among employed individuals compared to their unemployed counterparts, with no significant differences noted at other employment levels. Additionally, a significant positive correlation was found between fatigue and age. Moreover, a significant relationship was established between fatigue and employment status, indicating that fatigue levels were lower in the employed group compared to both the unemployed and retired groups. Lastly, a statistically significant positive correlation was noted between fatigue and the duration of MS. The significance threshold for all tests is established at $p<0.05$.

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Table 1. The mean and standard deviation of fatigue, depression, and spiritual health in relation to the demographic and clinical characteristics of the research subjects (n=200)

Variable	groups	Frequency (%)	Fatigue		depression		Spiritual health	
			M± SD	Test result	M± SD	Test result	M± SD	Test result
Gender	Male	61 (30.5)	46.18 ±15.92	t= -1.393 df= 198 p= 0.165	18.10 ± 11.44	t= 0.726 df= 198 p= 0.469	86.84 ± 29/61	t= -1.889 df= 91.721 p= 0.062
	Female	139 (69.5)	49.28 ± 13.81		19.55 ± 13.70		94.86 ± 22.51	
Educational attainment	Undergraduate	26 (13)	49.38 ± 13.60	F= 0.506 p= 0.604	22.04 ± 10.27	F= 1.361 p= 0.259	89.42 ± 20.25	F= 0.703 p= 0.496
	Diploma	66 (33)	49.48 ± 14.71		20.06 ± 13.32		90.44 ± 26.27	
	University	108 (54)	47.38 ± 14.68		17.82 ± 13.39		94.33 ± 25.44	
Marital status	Single	46 (23)	46.41 ± 16.40	F= 1.340 p= 0.264	18.20 ± 13.48	F= 0.150 p= 0.861	93.83 ± 24.03	F= 0.467 p= 0.628
	Married	129 (64.5)	49.57 ± 13.85		19.43 ± 12.80		91.22 v 25.92	
	Divorced or spouse deceased	25 (12.5)	45.52 ± 14.02		19.16 ± 13. 87		95.96 ± 22.99	
Employment situation	Employed	75 (37.5)	42.79 ± 15.93	F= 9.689 p= <0.001	15.11 ± 11.28	F= 6.228 p= 0.002	93.52 ± 24.11	F= 0.250 p= 0.779
	Retired	15 (7.5)	53.60 ± 9.92		21.07 ± 13.58		88.73 ± 32.23	
	Unemployed	110 (55)	51.44 ± 12.92		21.73 ± 13.47		91.94 ± 24.87	
Type of MS	Relapsing-progressive	12 (6)	32.08 ± 13.70	F= 5.408	9.17 ± 11.70	F= 2.937	97.33 ± 25.23	F= 1.903

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	Secondary progressive	21 (10.5)	51.43 ± 14,28	p= <0.001	24.62 ± 12.37	p= 0.022	80.95 ± 27.98	p= 0.111
	Primary progressive	24 (12)	53.88 ± 10.36		20.96 ± 13.60		86.50 ± 31.99	
	Relapsing-remitting	56 (28)	49.27 ± 12.48		18.57 ± 13.26		93.68 ± 23.33	
	Don't know	87 (43.5)	47.70 ± 15.47		18.99 ± 12.49		95.31 ± 22.72	
	no	111 (55.5)	47.59 ± 15.72		18.50 ± 12.93		95.88 ± 24.39	
Age (year)	Under 30	29 (14.5)		r= 0.201 p= 0.004		r= 0.101 p= 0.156		r= 0.019 p= 0.794
	30-39	49 (24.5)						
	40-50	75 (37.5)						
	Over 50	47 (23.5)						
	Mean ± SD	42.63 ± 10.77						
	Min - max	18 - 72						
Duration since MS diagnosis (month)	6-120	106 (53)		r= 0.162 p= 0.022		r= 0.053 p= 0.459		r= 0.121 p= 0.087
	121-240	62 (31)						
	241-360	25 (12.5)						
	361-480	7 (3.5)						
	Mean ±SD	147.25 ± 104.87						
	Min - max	6 - 480						

SD= standard deviation

The findings related to frequency distribution, mean and standard deviation of fatigue, depression, spiritual health and the related subscales are shown in table 2.

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Table 2. Frequency distribution, mean and standard deviation of fatigue, depression, spiritual health and the related subscales (n=200)

Variable	Mean ± SD	Min - max	Subscales, frequency (%)	
Fatigue	48.33 ± 14.52	9 - 63	Absence of fatigue (<36)	37 (18.5)
			requiring medical consultation	163 (81.5)
depression	19.11 ± 13.04	0 - 54	Minimal depression (0-13)	80 (40)
			Mild depression (14-19)	32 (16)
			Moderate depression (20-28)	39 (19.5)
			Severe depression (29-63)	49 (24.5)
spiritual health	92.41 ± 25.09	20 - 120	low spiritual health (20-40)	13 (6.5)
			moderate spiritual health (41-99)	86 (43)
			high spiritual health (100-120)	101 (50.5)
RWBS	50.91 ± 13.51	10 - 60		
EWBS	41.5 ± 14.57	10 - 60		

The relationship between fatigue and spiritual health was examined using Pearson correlation analysis. The results revealed a weak significant negative correlation (r=-0.294, p<0.001), indicating that improved spiritual health correlates with decreased fatigue. A stronger negative correlation was found between fatigue and the existential aspect of spiritual health (r=-0.382, p<0.001). However, no significant correlation was observed between fatigue and the religious dimension of spiritual health (r=-0.133, p=0.061), reflecting weak associations overall (table 3).

Table 3. Correlation between spiritual health and fatigue of the research subjects

	spiritual health		**RWBS**		**EWBS**	
fatigue	Pearson correlation	P value	Pearson correlation	P value	Pearson correlation	P value
	-0.294	<0.001	-0.133	0.061	-0.382	<0.001

Likewise, a Pearson correlation test assessed the interplay between depression and spiritual health. The analysis indicated a notable negative correlation (r=-0.650, p=<0.001), suggesting that enhanced spiritual health corresponds with reduced depression. A significant negative correlation was recorded between depression and the religious dimension of spiritual health (r=-0.366, p=<0.001). Additionally, a robust negative correlation emerged between depression and the existential dimension of spiritual health (r=-0.780, p=<0.001) (table 4).

Table 4. Correlation between spiritual health and depression of the research subjects

	spiritual health		**RWBS**		**EWBS**	
depression	Pearson correlation	P value	Pearson correlation	P value	Pearson correlation	P value
	-0.650	<0.001	-0.366	<0.001	-0.780	<0.001

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Discussion

This study aimed to investigate the correlations between spiritual health, fatigue, and depression in patients referring to the Tehran MS Association in 2024. The findings showed that 81.5% of participants experienced significant fatigue warranting medical consultation. The mean fatigue score was 48.33, indicating a considerable level of fatigue among subjects. This finding is consistent with the findings of Sparasci et al., who reported that a significant proportion (69%) of MS patients surveyed based on the FSS questionnaire experienced fatigue. Furthermore, their mean fatigue score was 41.3 (Sparasci et al., 2022), which closely resembles the outcomes observed in the current study. Additionally, Broch et al. reported that 81% of MS patients experienced fatigue, assessed by FSMC scale (Broch et al., 2021). Furthermore, our study results revealed that most participants displayed minor or mild depression. The average depression score was 19.11, which is a relatively low score considering the maximum score of the questionnaire (63). These results are consistent with Sparasci et al., who found that 73.2% of individuals with MS reported minor or mild depression based on BDI II scale (Sparasci et al., 2022). Additionally, the present study's outcomes support Lazarevic et al.'s findings, which showed that only 29.6% experienced high levels of depression as measured by the BDI II scale, similar to the current results (Lazarevic et al., 2021).

It was found in our study that 50.5% of the participants had a high level of spiritual health. The average spiritual health score was 92.41, indicating elevated spiritual health among most participants. Consequently, it can be concluded that the spiritual well-being of most participants in the study is at an elevated level, as indicated by the average score of 92.41, which is considered relatively high in comparison to the maximum possible score of the questionnaire, which is 120. The mean score for the religious health subscale was 50.91, surpassing the median of the overall scores. In contrast, the mean score for the existential health subscale was noted to be 41.5, which is below the median of the total scores. Consequently, it can be concluded that the subjects have exhibited a more favorable state of religious health, while the majority demonstrated a deficiency in the existential health dimension (pertaining to meaning in life). These findings are in agreement with Najafi et al., who observed that 50.9% of their subjects reported high spiritual health as measured by the SWBS scale (Najafi et al., 2022). Similarly, another study reported that 61.8% of their participants had high spiritual health as assessed by the SWBS scale (Shaygannejad and Mohamadirizi, 2020). Additionally, Niyazmand et al. found a significant average spiritual health score of 92.39 on the SWBS scale among MS patients, which aligns with the current study's results (Niyazmand et al., 2018). In the research conducted by Iranmanesh et al., the average score for spiritual health was notably high at 93.81, The mean score for the religious health subscale was also relatively high at 50.80, while the mean score for existential health was relatively low at 43.01 in comparison (Iranmanesh et al., 2014).

In this investigation, Pearson's correlation coefficient revealed a weak significant negative correlation between fatigue and spiritual health, indicating that improvements in spiritual health correlate with decreased fatigue. Furthermore, a significant negative correlation was identified

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between fatigue and the existential aspect of spiritual health, while no significant correlation was evident between fatigue and the spiritual dimension. It is noteworthy that these correlations were categorized as weak. The results are consistent with those of Lewis and colleagues, who identified a significant negative relationship between fatigue and spiritual health in patients undergoing cancer treatment (Lewis et al., 2014). Likewise, Yang et al. observed a significant negative correlation between spiritual health and fatigue among advanced cancer patients (Yang et al., 2023). Moreover, this study uncovered a relatively strong significant negative correlation between spiritual health and depression, suggesting that enhanced spiritual health correlates with reduced depression levels. A notable yet weak negative correlation was identified between depression and the religious-spiritual aspect, alongside a comparatively strong and significant negative correlation between depression and the existential aspect of spiritual well-being. These findings are in accordance with Dehghani et al., who investigated the interplay among spiritual health, stress, anxiety, and depression in MS patients (Dehghani, 2024). The results also corroborate Musa et al.'s findings, which demonstrated a significant negative correlation between spiritual health and depression among hemodialysis patients (Musa et al., 2018).

Besides, depression exhibited significant associations solely with employment status and MS type, with no notable links to other demographics. Tukey's two-way comparison demonstrated that employed individuals reported lower depression levels than the unemployed, with no differences at other levels. In the research conducted by Honarmand et al., individuals who were unemployed exhibited elevated scores on depression subscale (Honarmand et al., 2011). Furthermore, Tukey's analysis in our study, revealed that individuals with relapsing-progressive MS had lower depression levels than those with secondary progressive MS, with no significant differences elsewhere. In the research conducted by Salehpoor et al., it was found that the incidence of depression was greater in patients with secondary progressive multiple sclerosis (SPMS) compared to those with RRMS . Generally, one potential explanation for the observed disparity between these two patient populations pertains to the severity of the disease; specifically, individuals with SPMS frequently experience more enduring and severe symptoms than those with comparable issues in RRMS (Salehpoor et al., 2012).

Moreover, a significant positive correlation between fatigue and age was identified, indicating that fatigue increases with age. Additionally, a significant relationship was noted between fatigue and employment status. Tukey's two-way comparison illustrated lower fatigue levels among the employed compared to the unemployed and retired. Furthermore, a significant association between fatigue and MS type was found. Tukey's analysis indicated that individuals with relapsing-progressive MS experienced less fatigue than those with secondary progressive, primary progressive, relapsing-remitting, and those unaware of their MS type. A significant positive correlation between fatigue and MS duration was also observed, suggesting that fatigue increases with time since diagnosis. This study's results are consistent with a study that identified a link between fatigue and MS type, as well as higher fatigue levels in the unemployed (Schmidt and Jöstingmeyer, 2019). Additionally, our findings are congruent with Broch et al., who reported

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a significant positive relationship between fatigue and participant age, as well as increased fatigue in progressive MS compared to relapsing-remitting MS (Broch et al., 2021).

This research was conducted as a cross-sectional study, which inherently limits its ability to establish definitive cause-and-effect relationships, as it can only assess correlations. Furthermore, the reliance on self-report questionnaires for data collection may have led some participants to withhold truthful responses or provide inaccurate information. Additionally, factors such as forgetfulness or insufficient knowledge regarding their condition may have contributed to the provision of incorrect answers.

Conclusion

The current study sought to explore the correlation between spiritual well-being and the levels of fatigue and depression in individuals with multiple sclerosis who visited the Tehran MS Association in 2024. The findings of this research indicated that MS patients who report elevated spiritual health scores tend to experience reduced levels of fatigue and depression. Taking into account the findings of the current study alongside those of comparable research regarding the effects of spiritual health, fatigue, and depression on QOL, physical activity, and adherence to treatment, it is crucial to design the treatment approach for individuals with MS by adopting a comprehensive perspective that considers their psychological and spiritual requirements.

This investigation was limited to clients residing in Tehran. Considering that environmental and social factors can profoundly influence individuals' psychological well-being, it is recommended that similar studies be carried out among comparable populations in diverse climatic and social contexts. Additionally, in light of the notable correlation between spiritual health and both depression and fatigue, it would be beneficial to conduct a quasi-experimental study examining the impact of spiritual education on fatigue and depression among individuals diagnosed with MS. Also it is recommended that a qualitative investigation pertaining to the concepts of the current study be undertaken to achieve a more profound comprehension of the experiences of the participants.

Ethical Considerations

Compliance with ethical guidelines

The present study was approved by the ethics committee of Iran University of Medical Sciences (ethics code: IR.IUMS.REC.1403.114). Written informed consent was obtained from the participants after explaining the purpose of the study and ensuring confidentiality and anonymity.

Authors' contributions: Seyedoshohadaee M: Oversaw every phase of the research and conducted a thorough review; Mehrabi F: Involved in the design of the study, gathering of data, and drafting of the manuscript; and Haghani SH: Carried out the statistical analysis and

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interpretation of the data for this project. All the authors are responsible for the content of the manuscript and approved its final version.

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