Sleep Quality of Multiple Sclerosis Patients in Qom, Iran, in 2018

Zahra Bagheria, Zeynab Karimib, Raziyeh Sadat Ghoreishia, Zeynab Daneshpoora, Siamak Mohebi*

a Department of Public Health, Faculty of Health, Qom University of Medical Sciences, Qom, Iran
b Department of Health Education and Health Promotion, Faculty of Health, Qom University of Medical Sciences, Qom, Iran

*Correspondence should be addressed to Dr Siamak Mohebi, Email: mohebisiamak@yahoo.com

A-B-S-T-R-A-C-T

Background & Aims of the Study: Sleep disorders and poor sleep quality can lead to daytime sleepiness, fatigue, and depression as well as physical diseases. Such disorders are prevalent among multiple sclerosis (MS) patients; therefore, the present study aimed to determine the quality of sleep in MS patients in Qom, Iran, in 2018.

Materials and Methods: The present descriptive-analytical study was performed on 272 MS patients who were members of the MS Society of Qom, Iran. The samples were selected based on the inclusion and exclusion criteria using simple random sampling technique. The data were collected using a demographic form and Pittsburgh Sleep Quality Index. Finally, the collected data were analyzed in SPSS software (version 21) using descriptive statistics and analytical statistical tests. A p-value of less than 0.05 was considered statistically significant.

Results: Based on the findings, the mean score of sleep quality was 11.11±4.35. A total of 12.86% and 48.2% of the subjects had severe and moderate sleep disorders, respectively. However, 5.14% of them were not conflicted with any type of sleep disorder. Moreover, the sleep quality score had a significant relationship with age, occupation, marital status, and disease duration (P<0.05). However, the results of independent t-test showed no significant relationship between the mean sleep quality score and gender (P=0.578).

Conclusion: A significant percentage of patients suffered from some kind of sleep disorder. Therefore, it is recommended to include regular sleep hygiene and sleep quality improvement training in the routine care of such patients.

Please cite this article as: Bagheri Z, Karimi Z, Ghoreishi RS, Daneshpoor Z, Mohebi S. Sleep Quality of Multiple Sclerosis Patients in Qom, Iran, in 2018. Arch Hyg Sci 2019;8(4):259-265

Background

Multiple sclerosis (MS) is a relatively common chronic neurological disorder in which the nerve fibers demyelinate in various nerve regions of the central nervous system (1). The cause of the disease is unclear, but it seems that the immune mechanisms are activated against progressed myelin antigen of the disease and may lead to weakness, inability, and dependence on others for daily activities. This disease is considered one of the reasons for the inability of the young workforce. Accordingly, MS is a costly disease due to its incidence in the working-age and chronicity. Based on
previous studies, women are three times more likely to get diagnosed with MS, compared to men (2).

Based on the statistics, there are 15-30 cases of MS per 10,000 people. According to the experts in Iran MS Society, 5,000 people are added to this population each year (3). Furthermore, the prevalence of MS varies between women and men since 72% of MS patients are young women and girls while the rest are young active men (4). According to the statistics provided by the World Health Organization, a total of 2.5 million people are afflicted with this disease worldwide, 500,000 and 400,000 of whom are in Europe and North America, respectively (5). The disease is so prevalent that it is known as the most common disease of the century, and is the third leading cause of disability in the United States (6).

According to previous research, genetics, distance from the equator, and socioeconomic status are among the factors contributing to the prevalence of the disease (7). A study revealed that 9.17%, 8.38%, 2.11%, and 9.14% of MS patients had severe physical problems, social problems, depression, and anxiety (8). Another common problem in MS patients which causes severe impairment is poor sleep quality and sleep disorders (9).

Sleep disorders include difficulty falling asleep (sleep-onset latency of more than 30 min) and nocturnal awakening (more than once) (10). Such disorders can cause problems, including drowsiness, lethargy during the day, stress, anxiety, headache, and disturbance in daily routine (11). More than 50% of MS patients suffer from sleep disorders; therefore, it can be said that they experience sleep-related issues more than other chronic disease patients and other people in general. Furthermore, previous studies have revealed that female MS patients are more likely to have such problems, compared to men (12).

According to recent studies, sleep deprivation, inadequate sleep, and sleep disorders can potentially decrease the quality of life and increase the risk of death. Sleep disorders cause pathological, mental and neurological problems, as well as fatigue. Moreover, MS patients with sleep disorders suffer from concentration and learning disorders, and mood swings (14). Given the increasing prevalence of MS, its subsequent high risk of mortality, high costs, and many other problems, special attention should be paid to these patients and efforts should be made to reduce their problems. Based on the author's knowledge and the review of related literature, no similar study had been conducted in Qom province, Iran. Therefore, the present study was conducted to determine the quality of sleep in MS patients in Qom, in 2018.

**Materials & Methods**

The present cross-sectional study was performed on 272 MS patients who were members of MS society, in Qom. Samples were selected through random sampling method from a list of files in the MS society Center. Subsequently, the samples were called on their phones and asked to participate in the study. The inclusion criteria were willingness to participate and age range of 20-60 years. On the other hand, exclusion criteria were being within the first 2 years of the disease, in the advanced stages of the disease, or non-Iranian. Ethical considerations were respected in the current study. In this regard, the purpose of the study was explained for the participants, the information was kept confidential, and the subjects were informed of the dissemination of a general report of the research results. Moreover, informed consent was obtained from the research participants.

A demographic characteristics form and Pittsburgh Sleep Quality Index (PSQI) were used for data collection. PSQI measures 7 aspects of sleep through 19 items, namely
subjective sleep quality, prolonged sleep onset latency, sleep duration, sleep efficiency, sleep disorders, usage of hypnotic medications, and disturbance in daily routine. Each aspect was scored based on a scale from zero (no disorders) to three (severe disorders). To calculate the overall sleep quality score, the scores for each aspect were added to each other and a total score was achieved (0-21). A high score in each domain or the total score indicates poor sleep quality (15, 16). The validity and reliability of the abovementioned questionnaire have been confirmed in previous studies. The validity of the questionnaire was confirmed by Hosseinabadi et al. (r=0.88) and Soleimani et al. (r=0.84) through test-retest (17, 18). Moreover, the reliability of the questionnaire was verified through content and face validity tests by six faculty members of Faculty of Nursing and Midwifery, Azad University, Isfahan (Khorasgan) Branch, Iran (19).

The data were collected by a trained interviewer who was supposed to complete the questionnaires after interviewing the patients. Subsequently, the collected data were analyzed in SPSS software (version 21) using descriptive statistics and analytical tests, including independent t-test, ANOVA, and a post hoc test (i.e., Duncan). A p-value of less than 0.05 was considered statistically significant.

**Results**

Mean age of the participants was 37.95±9.14 years. Furthermore, the mean of disease duration in MS patients was 6.18±5.08 years. The rest of the demographic characteristics of the study subjects are presented in Table 1.

Mean score of sleep quality in the studied samples was 11.11±4.35. A total of 33.8%, 48.2%, and 12.86% had mild, moderate, and severe sleep disorders, whereas 14.5% had no sleep disorders. Table 2 shows the frequency and percentage of sleep quality status and its subscales in the subjects of the study.

According to the results of the independent t-test, there was no significant relationship between gender and sleep quality aspects (P<0.05). However, the independent t-test results showed a significant association between the mean sleep quality score (total score) and marital status (P=0.005). Moreover, there was a significant relationship between sleep disorders aspect and marital status (P<0.001).

Results of data analysis using ANOVA showed that the mean score of sleep quality (total score) had a statistically significant relationship with the occupations of the subjects (P=0.041). Accordingly, Duncan's test showed

| Table 1) Frequency distribution of demographic characteristics of the subjects |
|---------------------------------------------------------------|
| **Demographic characteristics** | **Number** | **Percentage** |
|---------------------------------|------------|----------------|
| **Gender**                      |            |                |
| Male                            | 98         | 36             |
| Female                          | 174        | 64             |
| **Marital status**              |            |                |
| Single                          | 80         | 29.4           |
| Married                         | 192        | 70.6           |
| **Occupation**                  |            |                |
| Self-employed                   | 144        | 52.9           |
| Governmental                    | 81         | 29.8           |
| Housewife                       | 45         | 16.5           |
| Unemployed                      | 2          | 0.7            |
| **Financial status**            |            |                |
| 1< million Tomans               | 76         | 27.9           |
| 1-2 million Tomans              | 76         | 27.9           |
| 2-3 million Tomans              | 65         | 23.9           |
| <3 million Tomans               | 37         | 13.6           |
| No income                       | 18         | 6.6            |
that the mean score of sleep quality of housewives was significantly lower than that of the other groups, while the sleep quality score of the unemployed subjects was significantly higher than that of the other groups. Furthermore, the ANOVA test showed no significant relationship between the mean score of sleep quality aspects and income (P>0.05).

The sleep quality score had a significant correlation with age (r=0.409, P<0.001) and disease duration (r=0.367, P<0.001). Table 3 shows the correlation of sleep quality aspects with age and disease duration of participants.

**Table 3** Correlation of sleep quality aspects with the age and disease duration

| Demographic characteristics | Subjective sleep quality | Prolonged sleep onset latency | Sleep duration | Sleep efficiency | Sleep disorders | Consumption of hypnotic medications | Disturbance in daily routine | Sleep quality (total score) |
|-----------------------------|--------------------------|-------------------------------|----------------|------------------|----------------|-----------------------------------|-----------------------------|---------------------------|
| Age | r | 0.286 | 0.209 | 0.250 | 0.291 | 0.379 | 0.369 | 0.119 | 0.409 |
|   | P | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| Disease duration | r | 0.299 | 0.245 | 0.194 | 0.148 | 0.288 | 0.381 | 0.045 | 0.367 |
|   | P | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |

According to the results, there was a significant relationship between sleep quality and marital status of MS patients so that single people had a better sleep quality. Similarly, other previous studies have revealed that marital status had a significant association with sleep quality and that single people had a better sleep quality (25) which could be due to the fact that married people are more occupied with thoughts about various difficulties. It can be said that married MS patients are more concerned due to their responsibilities toward their children and other family members, the anxiety associated with their illness, and fear of the future, which finally results in poor sleep quality. However, patients (21). Veauthier et al. in their study also reported that 96% of MS patients suffering from fatigue, had sleep disorders as well (22). In general, poor sleep quality is a common issue among MS patients (23). According to previous research, sleep disorders and poor sleep quality are more prevalent in MS patients, compared to the public and patients with other chronic diseases (12). The high prevalence of such issues in these patients can be due to restless legs syndrome, pain, waking up for urination, and chronic fatigue (9, 24).

According to the results, there was a significant relationship between sleep quality and marital status of MS patients so that single people had a better sleep quality. Similarly, other previous studies have revealed that marital status had a significant association with sleep quality and that single people had a better sleep quality (25) which could be due to the fact that married people are more occupied with thoughts about various difficulties. It can be said that married MS patients are more concerned due to their responsibilities toward their children and other family members, the anxiety associated with their illness, and fear of the future, which finally results in poor sleep quality. However,
some studies revealed that the sleep quality of married people is better (26), which may be due to differences in the statistical population of the study.

Based on the findings, there is a significant relationship between the occupation of patients and their sleep quality. Therefore, the quality of sleep in housewives was better than that in people with other occupations. Moreover, the present study revealed that unemployed people had poor sleep quality. This is in line with the results of other studies conducted by Arasteh et al., Zargarian et al., Adams et al., and Friedman et al. which have shown that people with a better socioeconomic status have better sleep quality (25) (27-29). Given the economic burden of MS, it is important to have a job that provides the patients with enough money. Moreover, the interactions between coworkers can be effective, regarding the provision of social support and mental peace which can affect their sleep quality (26).

In addition, a significant relationship was observed between disease duration and sleep quality which is consistent with the findings of a study performed by Vitkova et al. (30). Moreover, based on the results, the disease duration has a significant association with poor sleep quality. Furthermore, it was revealed that the progressive disease complications, decreased quality of life, and increasing age of the patient are effective factors resulting in the decrease of sleep quality (9, 31, 32). The results showed that there is a negatively significant relationship between the age of patients and their sleep quality which is in line with the findings of studies conducted by Tabrizi et al. (33) and Motaharinejad et al. (34) which revealed that sleep quality decreases with age (26). Furthermore, findings showed that there was no significant relationship between gender and sleep quality which is in line with that of a study performed by Merlino et al. (35). However, it is inconsistent with the results of the studies conducted by Vitkova et al. (30), and Leonavicius et al. (32) which could be due to a difference in the study populations.

In the present study, the highest prevalence of poor sleep quality was related to the aspects of sleep efficiency and sleep duration. A total of 100% of patients had very poor sleep efficiency and about 26% of them had severe sleep problems. Depression, fatigue, pain, nocturnal awakenings, daytime sleepiness, spasms, and restless legs syndrome are major causes of sleep issues in MS patients (21, 32, 36, 37).

One of the limitations was that the subjects were selected from the MS Society in Qom; consequently, the results cannot be generalized to all of the MS patients. The present study did not investigate the causes of poor sleep quality; therefore, future studies are recommended to investigate the causes and predictors of effective factors on sleep quality in MS patients. Moreover, it is suggested to conduct interventional studies in order to improve the sleep quality of these patients. Results of such studies can be used to evaluate the degree of poor sleep quality in MS patients. Moreover, the decision-makers can utilize the findings to develop programs in order to improve the patients’ sleep quality, thereby enhancing their quality of life.

### Conclusion

The results showed that poor sleep quality is a common problem in MS patients. Moreover, since the symptoms of this disease affect sleep quality, it is necessary to provide them with interventions. These interventions should include special training to improve symptoms, sleep hygiene, and sleep quality. Therefore, it is recommended to include regular sleep hygiene and sleep quality improvement training along with the routine care of such patients.
Footnotes

Acknowledgements
The authors would like to thank the Research and Technology Deputy of Qom University of Medical Sciences, the officials and staff of MS Society in Qom, as well as all the patients who participated in the study.

Funding
This study was extracted from a research proposal (IR.MUQ.REC.1396.12) which was financially supported by the Research and Technology Deputy of Qom University of Medical Sciences.

Conflict of Interest
The authors declare no conflict of interest in this article.

References

1. Winquist RJ, Kwong A, Ramachandran R, Jain J. The complex etiology of multiple sclerosis. Biochem Pharmacol 2007;74(9):1321-9. PMID: 17537409
2. Patwardhan MB, Matchar DB, Samsa GP, McCrory DC, Williams RG, Li TT. Cost of multiple sclerosis by level of disability: a review of literature. Mult Scler 2005;11(2):232-9. PMID: 15794399
3. Bakhshany N, Khosravi M. Cognitive status of patients with MS. Congress of Iranian Psychological Association, Tehran, Iran; 2011.
4. Tehrani SJ, Fatemenia F. Multiple sclerosis: overview of rehabilitation. Payam MS 2011;4(2):52-4. (In Persian) Link
5. Abedini M, Habibi Saravi R, Zarvani A, Farahmand MA. Epidemiologic study of multiple sclerosis in Mazandaran, Iran, 2007. J Mazandaran Univ Med Sci 2008;18(66):82-6. (In Persian) Link
6. Bradley WA. Neurology in CP: the neurological disorder, Vol II, Butler Worth. Australia: Heinemann Co; 2005. Link
7. Shaygannejad V, Dehnavi SR, Ashtari F, Karimi S, Dehghani L, Meamar R, et al. Study of type A and B behavior patterns in patients with multiple sclerosis in an Iranian population. Int J Prev Med 2013;4(Suppl 2):S279-83. PMID: 23776738
8. Behmanesh B, Farhang SA. Psychological training for multiple sclerosis patients. Tehran: Ravansheny Jamea; 2012. (In Persian) Link
9. Moreira NC, Damasceno RS, Medeiros CA, Bruin PF, Teixeira CA, Horta WG, et al. Restless leg syndrome, sleep quality and fatigue in multiple sclerosis patients. Braz J Med Biol Res 2008;41(10):932-7. PMID: 19030714
10. Field T, Hernandez-Reif M. Sleep problems in infants decrease following massage therapy. Early Child Dev Care 2001;168(1):95-104. Link
11. Veauthier C, Paul F. Sleep disorders in multiple sclerosis and their relationship to fatigue. Sleep Med 2014;15(1):5-14. PMID: 24360534
12. Bamer AM, Johnson KL, Antmann D, Kraft GH. Prevalence of sleep problems in individuals with multiple sclerosis. Mult Scler 2008;14(8):1127-30. PMID: 18632776
13. Baraz SH, Mohammadi E, Broumand B. Correlation of quality of sleep or quality of life and some of blood factors in hemodialysis patients. J Shahrekord Univ Med Sci 2008;9(4):67-74. (In Persian) Link
14. Vitkova M, Rosenberger J, Gdovinova Z, Szilasova J, Mikula P, Groothoff JW, et al. Poor sleep quality in patients with multiple sclerosis: gender differences. Brain Behav 2016;6(11):e00553. PMID: 27843703
15. Buysse DJ, Reynolds CF 3rd, Monk TH, Hoch CC, Yeager AL, Kupfer DJ. Quantification of subjective sleep quality in healthy elderly men and women using the Pittsburgh Sleep Quality Index (PSQI). Sleep 1991;14(4):331-8. PMID: 1947597
16. Smyth C. The pittsburgh sleep quality index (PSQI). Sleep Med 2001;2(3):264-70. PMID: 11438489
17. Reza H, Kian N, Pouresmail Z, Masood K, Sedat Seyed Bagher M, Cheraghi MA. The effect of acupressure on quality of sleep in Iranian elderly nursing home residents. Complement Ther Clin Pract 2010;16(2):81-5. PMID: 20347838
18. Soleimany M, Ziba FN, Kermani A, Hosseini FA. Comparison of sleep quality in two groups of nurses with and without rotation work shift hours. Iran J Nurs 2007;20(49):29-38. Link
19. Bahraini S, Bekhradi R, Mannani R, Naji SA. The effect of massage therapy on the quality of sleep in women with multiple sclerosis being admitted by Isfahan MS association. J Urmia Nurs Midwifery Facul 2011;8(4):197-203. Link
20. Sahraian MA, Rezaali S, Hosseiny M, Doosti R, Tajik A, Naser Moghadasi A. Sleep disorder as a triggering factor for relapse in multiple sclerosis. Eur Neurol 2017;77(5-6):258-61. PMID: 28359058
21. Kotterba S, Neusser T, Noreenber C, Bussfeld P,
Sleep Quality of Multiple Sclerosis Patients...

Glaser T, Dörner M, et al. Sleep quality, daytime sleepiness, fatigue, and quality of life in patients with multiple sclerosis treated with interferon beta-1b: results from a prospective observational cohort study. BMC Neurol 2018;18(1):123. PMID: 30143019

22. Veauthier C, Radbruch H, Gaede G, Pfueller C, Dörr J, Bellmann-Strobl J, et al. Fatigue in multiple sclerosis is closely related to sleep disorders: a polysomnographic cross-sectional study. Mult Scler 2011;17(5):613-22. PMID: 21278050

23. Bøe Lunde HM, Aae TF, Indrevåg W, Aarseth J, Bjorvatn B, Myhr KM, et al. Poor sleep in patients with multiple sclerosis. PloS One 2012;7(11):e49996. PMID: 23166808

24. Sarraf P, Azizi S, Moghaddasi AN, Sahraian MA, Tafakhori A, Ghajarzadeh M. Relationship between sleep quality and quality of life in patients with multiple sclerosis. Int J Prev Med 2014;5(12):1582-6. PMID: 25709794

25. Arasteh M, Yousefi F, Sharifi Z. Investigation of sleep quality and its influencing factors in patients admitted to the gynecology and general surgery of besat hospital in Sanandaj. Med J Mashhad Univ Med Sci 2014;57(6):762-9. (In Persian) Link

26. Papi S, Karimi Z, Ghaed Amini Harooni G, Nazarpour A, Shahry P. Determining the prevalence of sleep disorder and its predictors among elderly residents of nursing homes of Ahvaz city in 2017. Salmand 2019;13(5):576-87. (In Persian) Link

27. Adams J. Socioeconomic position and sleep quantity in UK adults. J Epidemiol Community Health 2006;60(3):267-9. PMID: 16476759

28. Friedman EM, Love GD, Rosenkranz MA, Urry HL, Davidson RJ, Singer BH, et al. Socioeconomic status predicts objective and subjective sleep quality in aging women. Psychosom Med 2007;69(7):682-91. PMID: 17766692

29. Zargarani FA, Maghsoudlou AR, Zaman Kamkar M. The effect of progressive muscle relaxation technique on the quality of sleep and fatigue in patients with multiple sclerosis. J Urmia Nurs Midwifery Facul 2018;15(12):911-20. Link

30. Vitkova M, Gdovinova Z, Rosenberger J, Szilasiova J, Nagyová I, Mikula P, et al. Factors associated with poor sleep quality in patients with multiple sclerosis differ by disease duration. Disabil Health J 2014;7(4):466-71. PMID: 25224987

31. Brass SD, Li CS, Auerbach S. The underdiagnosis of sleep disorders in patients with multiple sclerosis. J Clin Sleep Med 2014;10(9):1025-31. PMID: 2522763

32. Leonavicius R, Adomaitiene V. Features of sleep disturbances in multiple sclerosis patients. Psychiatr Danub 2014;26(3):249-55. PMID: 25191772

33. Tabrizi FM, Radfar M. Fatigue, sleep quality, and disability in relation to quality of life in multiple sclerosis. Int J MS Care 2015;17(6):268-74. PMID: 26664332

34. Motaharinezhad F, Parvaneh S, Bakhtiar AH, Alizadeh N, Ghahari S. The effect of mood and cognition on relationship between sleep disturbances and fatigue in people with multiple sclerosis. Koomesh 2016;17(3):613-9. (In Persian) Link

35. Merlino G, Fratticci L, Lenchig C, Valente M, Cargnelutti D, Picollo M, et al. Prevalence of ‘poor sleep’ among patients with multiple sclerosis: an independent predictor of mental and physical status. Sleep Med 2009;10(1):26-34. PMID: 18207453

36. Ghajarzadeh M, Sahraian MA, Fateh R, Daneshmand A. Fatigue, depression and sleep disturbances in Iranian patients with multiple sclerosis. Acta Med Iran 2012;50(4):244-9. PMID: 22592574

37. Frauscher B, Egg R, Brandauer E, Ulmer H, Berger T, Poewe W, et al. Daytime sleepiness is not increased in mild to moderate multiple sclerosis: a pupillographic study. Sleep Med 2005;6(6):543-7. PMID: 16084765