

**Maedeh Pourhossein
Alamdari¹,
Fazlollah Ahmadi¹,
Mahmoud Abedini²**

THE EFFECT OF CONTINUOUS CARE MODEL ON SLEEP QUALITY IN PATIENTS WITH MULTIPLE SCLEROSIS

Tarbiat Modares University¹
Faculty of Medical Sciences
Department of Nursing
Tehran, Iran

Mazandaran University of Medical Sciences²
Mazandaran Province, Iran

Університет Тарбіат Модарес¹
факультет медичних наук
кафедра медсестринської справи
Тегеран, Іран

Мазандаранський університет медичних наук²
провінція Мазандаран, Іран
e-mail: ostadebartar@yahoo.com

Цитування: Медичні перспективи. 2021. Т. 26, № 1. С. 163-168

Cited: Medicni perspektivi. 2021;26(1):163-168

Key words: continuous care model, sleep, multiple sclerosis

Ключові слова: модель безперервного догляду, сон, розсіяний склероз

Ключевые слова: модель непрерывного ухода, сон, рассеянный склероз

Abstract. The effect of continuous care model on sleep quality in patients with multiple sclerosis. Alamdari M.P., Ahmadi F., Abedini M. Multiple sclerosis is a chronic and unpredictable disease and is a growing trend and, like other chronic diseases, affects one's quality of life and since sleep quality is one of the dimensions of quality of life, this study aimed to investigate the effect of applying continuous care model on sleep quality of patients with MS in 2013. This clinical trial study was performed on 80 patients with multiple sclerosis who were randomly assigned to experimental and control groups. Data collection tools included demographic information questionnaire, PSQI questionnaire and model implementation in four stages (familiarization, sensitization, control, evaluation). Model stages were performed individually and in groups for three weeks according to patients' educational needs (sleep, activity, medication and nutrition) and after two months follow up, control and evaluation were performed. Data were analyzed using Chi-square test, independent t-test and repeated measures ANOVA and spss16 software. Statistical analysis of variance (ANOVA) with repeated measures showed a significant difference between the mean of total score and the scores of sleep quality dimensions in three times between the two groups ($p < 0.05$). It can be concluded that the implementation of continuous care model causes a significant difference in the sleep quality of patients with MS.

Реферат. Вплив моделі тривалого лікування на якість сну у хворих на розсіяний склероз. Аламдарі М.Б., Ахмаді Ф., Абдіні М. Розсіяний склероз є хронічним і непередбачуваним захворюванням та має тенденцію до зростання і, як й інші хронічні захворювання, впливає на якість життя людини. Оскільки якість сну є одним із вимірів якості життя, це дослідження мало на меті дослідити ефект від застосування моделі тривалого лікування на якість сну пацієнтів з РС у 2013 р. Це клінічне дослідження проводилось на 80 пацієнтах з розсіяним склерозом, яких було рандомізовано і віднесено до експериментальної та контрольної груп. Системи збору даних включали демографічний опитувальник, анкету Пітсбурзького індексу якості сну (PSQI) та впровадження моделі в чотири етапи (ознайомлення, сенсibiлізація, контроль, оцінка). Модельні етапи виконувались індивідуально та в групах протягом трьох тижнів відповідно до потреб пацієнтів (сон, активність, ліки та харчування), а через два місяці спостережень, проводили контроль та оцінку. Дані аналізували за допомогою тесту хі-квадрат, незалежного t-тесту, програм повторного вимірювання ANOVA та програмного забезпечення SPSS 16. Статистичний дисперсійний аналіз (ANOVA) із повторними вимірами показав достовірну різницю між середнім значенням загального бала та оцінками показників якості сну в три рази між двома групами ($p < 0,05$). Можна зробити висновок, що впровадження моделі безперервного догляду викликає значну різницю в якості сну пацієнтів з РС.

MS is an inflammatory and degenerative disease of the central nervous system that results in extensive destruction of the myelin sheath in the brain

and spinal cord [1]. In 2008, the World Health Organization reported MSDs to about 1.3 million

people worldwide [2] And since 2008 about 2.5 million people worldwide have been affected.

Symptoms of MS are most commonly seen in the age range of 15 to 50 years and take many forms [3] and studies have reported mental disorders in MS patients in the areas of depression, anxiety, and sleep. Good and quality sleep is very important in healthy and sick people because sleep is considered a basic human need [4]. Sleep also affects one-third of daily life, but also affects the quality of the remaining two-thirds of life [5]. One of the most common symptoms that severely reduce the quality of life in MS is sleep disorders [6], which can have different causes. Sleep disorders affect one's mental and physical activity in demographics, women are more likely to have sleep problems than men [7].

Since the disease is unpredictable and according to systems theory, the growth and function of different body systems is always variable and requires nurse guidance and care intervention. Therefore, the emergence of diverse models of nursing and the advancement of medical technology have greatly contributed to the care and treatment process, but care and human relationships need to be developed in nursing to fill the gaps in care patterns that have emerged so far.

Continuous care model is designed to identify educational needs and health problems and sensitize clients to accept ongoing health behaviors and help maintain their health and well-being, which designed and evaluated by Ahmadi in 2001 for patients with chronic coronary artery disease, it has an impact on the quality of life of these patients. The model consists of four stages of familiarization, sensitization, control and evaluation. Given the chronic nature of the disease and its high prevalence in recent decades in our country, given that the prevalence of MS is increasing and it is imposing huge medical costs on the patient, the family and the health care system in the country[8].

Existing programs so far have not been useful in controlling the various problems of this disease and the need for a consistent and effective care model for sleep quality of these patients is felt. Because with the continuous care model the patient constantly feels the shadow of the disease and shows consistent behavioral control over their illness, it seems possible to improve the quality of sleep in the shadow of continuous care and nurses with multiple sclerosis. They can play an important role in educating the patient about ways to prevent and reduce the symptoms and complications of the disease [9]. So far, no research has been conducted in the world on the effect of continuous care on the quality of sleep in patients with multiple sclerosis.

The purpose of this study was to investigate the effect of continuous care model on sleep quality in patients with multiple sclerosis in both control and experimental groups.

MATERIALS AND METHODS OF RESEARCH

This study is a randomized controlled clinical trial designed to investigate the effect of applying continuous care model on sleep quality of patients with MS. To investigate the effect, the researcher used two control and experimental groups of patients with multiple sclerosis. This study was performed on female patients with multiple sclerosis, a member of the MS Society of Mazandaran province.

Samples were selected by convenience sampling from those who referred to the MS Center of Mazandaran province who met the inclusion criteria. Random allocation method was used to control the experimental and control groups. For this purpose, all patients with MS who met the inclusion criteria were prepared. These patients were 145 and then numbered and each patient was given a specific number. For this purpose, all patients with MS who met the inclusion criteria were prepared. These patients were 145 and then numbered and each patient was given a specific number. Then, using the table of random numbers in the statistical books in which the numbers are written consecutively but do not follow any specific pattern and only the order of the numbers is adjusted by chance, 145 patients were called. The first 45 people were placed in the control group and the next 45 people were placed in the experimental group.

The data were calculated using [10] studies and Pokak statistical method and Gigi's table (1970) with 95% confidence and 5% error and the number of samples was estimated to be 40 in each of the two control and experimental groups, with a total of 80.

After placing the samples in two groups of control and experimental due to lack of bias in the research, in the control group, the questionnaires were completed in three stages at one-month interval and then, in the experimental group, follow up care model implementation and questionnaires were completed.

The control group received only ongoing care. Inclusion criteria included:

1. Patients based on clinical findings, laboratory studies, and diagnosis of a specialist physician with MS;
2. Patients range in age from 20 to 45 years;
3. Through the study of patient records, the expanded disability status score of the samples ranged from 0 to 5.5 (mild to moderate disability status);

Be literate and exclusion criteria include:

1. Patients who do not wish to continue participation during the trial for any reason;

2. Patients who have known serious physical, mental, and medical complications during the intervention process.

The research instruments were demographic information questionnaire and Pittsburgh sleep quality questionnaire. The minimum and maximum sleep quality scores in this questionnaire were in the range of 0-21, with more scores indicating worse sleep quality.

The face validity and content validity of this questionnaire were also confirmed in a Bahraini study in Iran using a re-test [11]. In this study, test-retest method was used to determine the reliability of the instrument, the completed questionnaire was completed twice in 10 days by 15 eligible patients with multiple sclerosis. After determining the correlation coefficient, the reliability of the research instrument was confirmed by $r=0.85$.

The model of follow-up care is a native model and was implemented in the patients in the experimental group as follows:

The first step in the continuous care model is to familiarize ourselves with MS disease and to identify the chronic nature of the disease and the problems associated with MS. The researcher first made a phone call to all the experimental group samples and invited them to attend the center. With the presence of the MS patient and his family, the patient was introduced to the patient, expressed expectations for each other, and noted the need for continuity and non-interruption of the care relationship between the two parties by the end of the prescribed period (3 months). The familiarization phase was performed individually in all subjects in the experimental group.

The second step is the continuous care model of sensitization. The sensitization process is intended to engage MS patients and their families in implementing a continuous care approach, if MS patients and their families become aware of the susceptibility to the disease and their problems and their role in MS, one can hope to use the pattern of appropriate health behaviors. The sensitization stage was not the same in all samples, and the sensitivity was different. To achieve better results, the researcher conducted a sensitization phase based on the identification and misclassification of health behaviors in the samples in four domains of diet, activity, sleep, and medication for patients with MS. Measures taken during the sensitization phase of the study samples were held in the form of meetings to conduct individual and group counseling and group discussion with the sample and their families at the center. An average of 6 to 8 sessions was held with the patient with multiple sclerosis and the family. In cases where the problem was outside the researcher's expertise and expertise, the client and family were referred to a specialist and a specialist.

The third stage is the follow-up care model. In achieving the goals of the follow-up care model, it is important to examine how the care is continued and continued so the rest of the three-month follow-up is relevant. At this stage, follow-up care was repeatedly performed weekly, with regular telephone calls 2 times a week, attendance at the center tailored to care needs, and completion of checklists. The responsibility for caring for MS patients and for overseeing the family was taken care of by institutionalizing and sustaining good and sustainable health behaviors and the researcher came out of the role of educator and carer and took on the role of a guide alongside the MS patient and family.

The fourth step is the continuous care model of evaluation. It is true that evaluation is the fourth stage of the model, but it is addressed and implemented at all stages from the beginning. Evaluation in this study was done in two ways. Step by step evaluation was carried out step by step with implementation of the strategies by the sample and its follow up and control and if new strategies were not suitable, new strategies were replaced.

Final evaluation was done by asking a question at the end of the third month of the second phase of the study. Will the behaviors that were trained and practiced among the samples during this period continue and are institutionalized as a proper health behavior? And have patients actually accepted MS with its chronic nature? And has the researcher achieved the research goals? Finally, sleep quality was assessed in three stages before the intervention, one month after the intervention and two months after the intervention and after collecting the questionnaires repeated measures ANOVA was used to investigate the trend of changes in sleep quality in the SPSS software environment and the significance level was considered less than 0.05.

RESULTS AND DISCUSSION

In order to control for confounding factors and the similarity of the two groups in terms of demographic characteristics and characteristics related to the disease, the distribution of these variables was studied using statistical tests with significance level less than 0.05 in both groups.

Findings of this study showed that the majority of patients (27.5%) were in the control group in the age group of 25-29 years and 30-34 years and in the experimental group in the age group of 25-29 years. Regarding the marital status of the subjects under study, the highest percentage of the subjects were married in the control group (57.5%) and in the experimental group (62.5%). In terms of employment status, most of the studied units are housewives in control group (42.5%) and housewives in experimental group (40%).

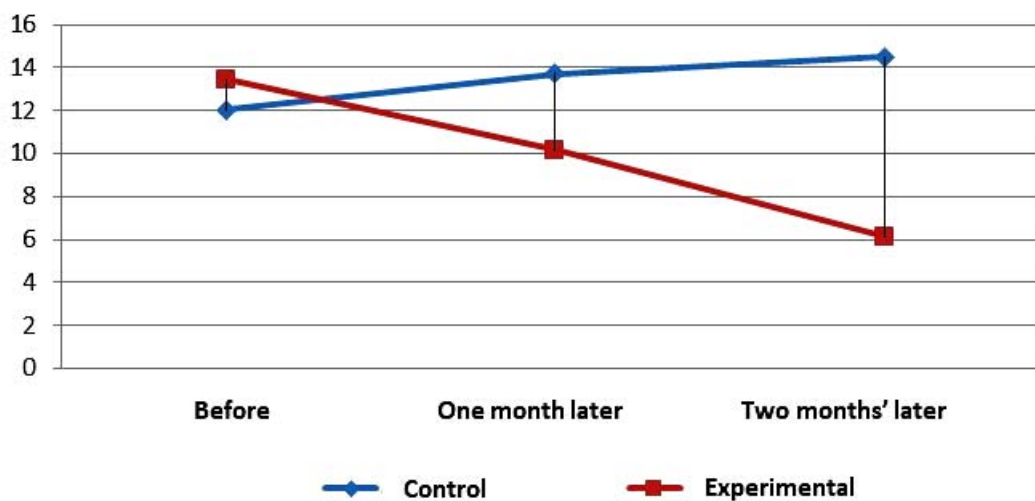
In terms of economic status and adequacy of family income, most of the studied units are in middle income in experimental and control groups. Regarding the duration of the disease, the highest frequency (60%) of the study units were in the control and experimental groups in the range of 1-5 years. Also, the prevalence of disability in the control and experimental groups indicates that the majority of patients (40%) in the control and experimental groups are in the range of 0-3.

According to table and figure, repeated measure ANOVA in all dimensions of sleep quality and total sleep quality index in the control and experimental groups showed significant differences in three measurements. This means that in the control group, the sleep quality dimensions and the overall sleep quality index are measured three times, and in the experimental group, the caregiver model improves three times.

Comparison of mean scores of different dimensions and total score of sleep quality index in control and experimental groups in three measurements (before intervention, one month and two months later)

Dimensions	Time	Control group Avg (standard deviation)	Experimental group Avg (standard deviation)	Independent t-test result (p)
Quality of mental sleep	Before intervention	(0.782) 1.55	(0.861) 1.97	0.124
	one month later	(0.802) 1.85	(0.640) 1.47	0.023
	two months later	(0.704) 1.62	(0.607) 0.70	0.000
Repeated analysis of variance		0.016	0.000	
Duration of sleep	Before intervention	(0.615) 1.67	(0.735) 1.65	0.864
	one month later	(0.630) 1.75	(0.572) 1.32	0.002
	two months later	(0.729) 1.92	(0.667) 0.625	0.000
Repeated analysis of variance		0.002	0.000	
Sleep period	Before intervention	(0.764) 1.92	(0.735) 2.15	0.184
	one month later	(0.697) 2.02	(0.722) 1.87	0.048
	two months later	(0.722) 2.12	(0.677) 1.05	0.000
Repeated analysis of variance		0.025	0.000	
Sleep adequacy period	Before intervention	(0.933) 2.52	(0.992) 2.20	0.135
	one month later	(0.816) 2.50	(1.15) 1.72	0.001
	two months later	(0.784) 2.52	(1.19) 1.52	0.000
Repeated analysis of variance		0.029	0.003	
sleep disorders	Before intervention	(0.757) 1.20	(0.764) 1.92	0.555
	one month later	(0.648) 1.70	(0.552) 1.55	0.069
	two months later	(0.723) 1.80	(0.483) 1.15	0.000
Repeated analysis of variance		0.000	0.000	
Hypnotic drug use	Before intervention	(1.06) 1.70	(0.938) 1.87	0.438
	one month later	(1.17) 2.10	(0.900) 1.10	0.000
	two months later	(0.816) 2.47	(0.814) 0.550	0.000
Repeated analysis of variance		0.005	0.000	
Dysfunction during the day	Before intervention	(0.904) 1.45	(0.939) 1.70	0.229
	one month later	(0.919) 1.77	(0.790) 1.12	0.001
	two months later	(0.919) 2.02	(0.784) 0.525	0.000
Repeated analysis of variance		0.000	0.000	
Total sleep quality index	Before intervention	(2.92) 12.02	(2.90) 13.47	0.129
	one month later	(2.99) 13.70	(2.36) 10.17	0.000
	two months later	(2.33) 14.50	(2.12) 6.12	0.000
Repeated analysis of variance		0.000	0.000	





Mean "quality of sleep" at three time before intervention, one month later and two months' later intervention in control and experimental groups

CONCLUSION

1. Sleep studies in MS patients are focused in two areas. Prevalence of sleep disorders and relationship between sleep disorders and fatigue in the study of Merlino et al. (2000), about 47.5% of patients with multiple sclerosis sleep, meaning that their total sleep quality score is more than 5 [12]. Sensory findings showed that the total score of Pittsburgh sleep quality index was higher in the patient group than in the control group. This indicates that MS patients have worse sleep quality, longer sleep duration, shorter sleep duration, more sleep disturbance. These patients are taking more sleeping medications to sleep and are having daytime sleep problems due to their daytime sleep experience [13]. Factors affecting sleep disorders in MS patients are pain, muscle cramps and spasms, enuresis, fatigue, anxiety and stress and anxiety about the future [14]. Therefore, the results indicate poor sleep quality in people with multiple sclerosis participating in the study, which is in agreement with the results of studies by Induruwa et al. [15], Melamed et al. [16], Bamer et al. [9], which indicate that sleep disorders and poor quality of sleep in this group of people. Before intervention, the two groups were homogeneous in terms of sleep quality, but there was a significant difference between the mean sleep quality scores after the implementation of the continuous care model.

2. Results showed a significant difference between the mean scores of sleep quality in the dimensions of subjective sleep quality, sleep duration, sleep adequacy, sleep disorders, hypnotic drug

use, daytime sleep disorder and total sleep quality index in the experimental group before and after the intervention, which shows the positive effect of continuous care model implementation on sleep quality of the experimental group and is in agreement with the results of the study of Golafruz et al. In a study conducted by Golafruz et al., there was a significant difference between the mean scores of sleep quality in the experimental group before and after the intervention, however, this difference was not significant in the control group.

3. The result is that the implementation of a continuous care model is effective in enhancing the sleep quality of diabetic patients [17]. In general, the researcher addressed the problem by providing educational pamphlets, continuing education and in-person training that addressed problems in patients with inappropriate health behaviors such as not using proper sleeping techniques and followed-up by telephone and in-person with the experimental group in order to continue with the client's appropriate health behavior. Also, effective and continuous communication with the patient and his family emphasized the essential problems and provided necessary guidance.

4. So the reason for the improvement of the specimens can be mentioned the proper performance of the specimens in providing conditions for a good sleep. Such as not using fluids near bedtime to prevent waking up during sleep was one of the strategies that were trained to have proper sleep or mentioned taking light exercise at home to reduce muscle cramps and spasms and pain during sleep, avoiding heavy activity during the day, not having

much sleep during the day. Also, improvement of sleep quality in the intervention group after intervention may be related to individual patients' conditions such as reduced levels of anxiety and depression, fatigue, symptoms of illness and emotional stress, family support, disease stages.

5. In Zhang study, the implementation of continuous care model in association between sleep quality and cardiovascular damage in pre-dialysis patients with chronic kidney disease [18]. Since this model focuses on all factors affecting sleep quality

and sensitization process, family involvement in follow-up and training is considered to be the principle, the increase in sleep quality in the experimental group, compared to before the model run, had an upward trend in the two months after the model run.

6. Therefore, using a continuum care model as a native model can be effective in reducing many of the complications and complications, and most importantly the chronic nature of MS in MS patients.

Conflict of interests. The authors declare no conflict of interest.

REFERENCES

1. Patil NJ, Nagaratna R, Garner C, Reghuram NV, Crisan R. Effect of integrated yoga on neurogenic bladder dysfunction on patients with multiple sclerosis. *Complementary Therapies in Medicine*. 2012;20(6):424-30. doi: <https://doi.org/10.1016/j.ctim.2012.08.003>
2. World health organization. mental health, neurology disorder: public health challenges. [cited 2011]; Available from: <http://www.worldMSday.org/wordpress/wp-content/uploads/2013/05/ms-vlo.pdf>
3. Murray ED, Price BH, Buttner N. Depression and psychosis in neurological practice. *Neurology in Clinical Practice*, 6th. Bradley WG, Daroff RB, Fenichel GM, Jankovic J, editors. Butterworth Heinemann. 2016;2(201):2.
4. Hojat M, Karimyar Jahromi M, Karami Z. Effect of continuous care model on sleep quality and dialysis adequacy of hemodialysis patients: A clinical trial study. *Med Surg Nurs J*. 2015;4(1):31-38.
5. Brass SD, Duquette P, Proulx-therrien J, Auerbach. Sleep disorders in patients with multiple sclerosis. *Sleep Medicine Reviews*. 2010;14(2):121-9. doi: <https://doi.org/10.1016/j.smr.2009.07.005>
6. Moreira N, Damasceno R, Medeiros C, Bruin P, Teixeira C, et al. Restless leg syndrome, sleep quality and fatigue in multiple sclerosis patients. *Brazilian Journal of Medical and Biological Research*. 2008;41(10):932-7. doi: <https://doi.org/10.1590/S0100-879X2008001000017>
7. Bamer A, Johnson K, Amtmann D, Kraft G. Prevalence of sleep problems in individuals with multiple sclerosis. *Multiple Sclerosis Journal*. 2008;14(8):1127-30. doi: <https://doi.org/10.1177/1352458508092807>
8. Haghdoost Z, Nourozi K, Hosseini MA. Effect of application of continuous care model on quality of life and prevention of complications in coronary artery bypass graft surgery patients. *Iran J Rehabil Res Nurs*. 2015;1(2):1-9.
9. Khezri-Moghaddam N, Ghorbani N, Bahrami-Ehsan H, Rostami R. Efficacy of Group Therapy on Reduction of Psychological Signs of Multiple Sclerosis Patients. *Journal of Clinical Psychology*. 2012;4(1):13-22.
10. Hasanzadeh P, Fallahi Khoshknab M, Norozi K. Impacts of Journaling on Anxiety and stress in Multiple Sclerosis patients. *Complementary Medicine Journal*. 2014;2(2):183-93.
11. Bahraini S, Naji A, Mannani R, Bakhradi R. The effect of massage therapy on the quality of sleep in women multiple sclerosis being admitted by Isfahan MS. association. *Journal of Urmia Nursing and Midwifery Faculty*. 2017;8(4):197-203.
12. Merlino G, Fraticci L, Lanchig C, Fraticci L, Lenchig C, Valente M, Cargnelutt I D, Acello M, et al. Prevalent of poor sleep among patients with multiple sclerosis: an independent predictor of mental and physical status. *Sleep Medicine*. 2009;10(1):26-34.
13. Sansory GM, Gumus K, Pazvantoglu O. Psychiatric symptoms in patients with multiple sclerosis. *General Hospital Psychiatry*. 2013;35(2):134-40. doi: <https://doi.org/10.1016/j.genhosppsych.2012.10.011>
14. Caminero A, Bartolome M. Sleep disturbances in multiple sclerosis. *Journal of The Neurological Science*. 2011;309(1-2):86-91. doi: <https://doi.org/10.1016/j.jns.2011.07.015>
15. Induruwa I, Constantinescu CS, Gran B. Fatigue in multiple sclerosis – a brief review. *Journal of Neurological Sciences*. 2012;323(1-2):9-15. doi: <https://doi.org/10.1016/j.jns.2012.08.007>
16. Melamed L, Golan D, Loboshitzky R, Lavi I, Miller A. Melatonin dysregulation, sleep disturbances and fatigue in multiple sclerosis. *Journal of Neurological Sciences*. 2012;314(1-2):37-40. doi: <https://doi.org/10.1016/j.jns.2011.11.003>
17. Golafruz M, Sadeghi H, Mousavi SQ, Tabaraee Y. The effect of using Continuous Care Model On sleep quality in people with type 2 diabetes. *Quarterly Journal of Sabzevar University of Medical Sciences*. 2014;21(4):664-55.
18. Zhang J, Wang C, Gong W, Peng H, Tang Y, Li CC, et al. Association between sleep quality and cardiovascular damage in pre-dialysis patients with chronic kidney disease. *BMC Nephrol*. 2014;15:131. doi: <https://doi.org/10.1186/1471-2369-15-131>

The article was received
2020.08.16