RESEARCH

The effect of patient-centered empowerment program through telenursing on self-management in people with multiple sclerosis: a double-blinded randomized clinical trial

Fateme Bayat[1], Reza Negarandeh[2] and Shahzad Pashaeypoor[1*]

Abstract

Background   Multiple sclerosis (MS) is a chronic disease that presents individuals with various caregiving challenges, making their empowerment based on their real needs essential. The aim of this study was to determine the impact of a patient-centered empowerment program through telenursing on the self-management of people with multiple sclerosis (PwMS).

Methods   The present study was a double-blinded, randomized clinical trial conducted on 90 PwMS attending MS Society using a convenience sampling method with random block allocation. The inclusion criteria were a definite diagnosis of MS for at least 6 months, age range of 18 to 60 years, ability to use a telephone and smartphone, no other physical or mental illnesses, and no cognitive or psychological disorders based on self-report and patient records. Additionally, the participants who were not able to continue the intervention due to reasons such as fatigue, unwillingness, or hospitalization could not follow the study. The tools used included a demographic questionnaire and the Multiple Sclerosis Self-Management Scale (Healthcare Provider Relationship and Communication, Treatment Adherence/Barriers, Social/Family Support, MS Knowledge and Information, and Health Maintenance Behavior). The research intervention involved providing an empowerment program through 5 telenursing sessions over 4 weeks, with the number of sessions varying based on each person's needs. Data analysis was performed using SPSS software version 26.

Results   In this study, data from 90 individuals with MS were analyzed. Findings indicated that the majority of the study participants were female (62.2%) and married (55.6%). The results indicated no significant differences in the mean scores of self-management and its relevant subscales, between the two groups before the intervention ($P > 0.05$). However, after the intervention, the mean scores showed a significant difference in the intervention group compared to the control group in terms of self-management index (91.62 ± 11.14 vs. 88.51 ± 11.27), and subscales

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of MS Knowledge and Information (15.82 ± 1.28 vs. 14.89 ± 2.4) and Health Maintenance Behavior (15.27 ± 2.87 vs. 14.84 ± 3.37) ($P < 0.05$). The calculated effect size indicates a medium effect (Cohen's d = 0.56).

Conclusion Empowering PwMS, focusing on their unique needs and delivering it through telenursing, can be an effective method in enhancing their self-management capabilities. Therefore, it is recommended that healthcare providers in chronic diseases prioritize patient empowerment based on individual needs.

Clinical trial registration This research was registered (13-09-2021) in the https://irct.behdasht.gov.ir with registration number: IRCT20210824052281N1.

Keywords Multiple sclerosis, Empowerment, Self-management, Patient-centered, Telenursing

Background

Multiple sclerosis (MS) is a chronic inflammatory, demyelinating, and progressive neurological disorder with an unpredictable and sudden onset [1]. The disease involves the loss of myelin and subsequent destruction leading to damage to neurons and injury to nerve axons [2]. Although various factors play a role in increasing the risk of disease progression and MS susceptibility, the true cause of this disease remains unknown [3]. Currently, approximately 2.5 million people worldwide suffer from MS, with 700,000 cases reported in Europe [4]. The global average prevalence of MS is 33 per 100,000 individuals, although there is significant variance among different countries [5]. The prevalence of MS in Iran is estimated to be 29.3 per 100,000 individuals [6]. A meta-analysis study in 2019 demonstrated an increasing trend in the prevalence and incidence of MS in Iran over time [6]. In individuals with genetic predisposition, several modifiable environmental factors likely play a role in determining susceptibility to MS. Among the environmental factors assessed, there is evidence suggesting a correlation between the disease and Epstein-Barr virus infection, cigarette smoking, vitamin D levels, and increased body mass index during adolescence [7].

This disease manifests with a wide range of symptoms, including fatigue, difficulty walking, muscle stiffness and spasms, cognitive problems, urinary dysfunction, sexual disorders, pain, emotional or mood disorders, vision problems, dizziness, tremors, and more [8]. In a study conducted by Krats and colleagues in 2017, it was shown that MS has a significant impact on employment, disability, social impairment, life satisfaction, challenges in the daily living activities, physical and mental health, and community integration [9]. Additionally, MS imposes a considerable economic burden on both the patient and society [10]. Various aspects of quality of life, including friendships, family relationships, and occupational status, are influenced by MS [11]. Sexual dysfunction is also a common and highly stressful issue in individuals with MS. It is worth emphasizing that sexual dysfunction can have a significant adverse impact, especially on the quality of life related to health status, particularly for young individuals with MS [12].

Patient self-management in chronic diseases is increasingly crucial for improving health behaviors, health outcomes, and quality of life, and in some cases, it has been effective in reducing the use of healthcare services and the burden of social costs related to chronic conditions [13]. Although innovation in biomedical research has led to medical therapies that can advance the treatment of many chronic diseases, managing these conditions, which involves engaging patients to support their long-term adherence to preventive or therapeutic regimens, can enhance health performance and outcomes. This approach typically involves adopting and maintaining multiple behavioral changes in lifestyle, including dietary habits, exercise, adherence to prescribed medications, as well as managing complex relationships with family and healthcare providers and systems [13]. Therefore, the development of intervention programs that can educate and assist individuals in adopting and maintaining long-term health behavior changes, aiming to prevent further disease progression and improve quality of life, is an ongoing necessity [13]. Self-management is the most crucial component in the management of chronic diseases, including MS. Currently, there is no cure for MS, and its alternatives involve living with a lifelong condition and managing symptoms, recognized as a fundamental element in disease care [14].

Individuals with MS rely on themselves for managing daily activities and self-care. Empowerment is significant for them to make informed choices, assess the impacts of these choices, and assist in preventive, personal, and participatory healthcare, aiming at active management [15]. Empowerment is a process that involves the creation of mechanisms through which individuals, organizations, and communities gain mastery over their lives. Therefore, patient empowerment can be defined as a process during which individuals with inherent capabilities discover and develop their ability to take responsibility for their lives [15]. Types of empowerment methods include social, educational, economic, political, and psychological empowerment [16]. Patient-centered education is an essential component in the management of chronic diseases [17]. In patient-centered education, self-management programs are developed and maintained through

Bayat *et al. BMC Neurology*   (2025) 25:138

Page 3 of 10

collaboration among patients who express their concerns, priorities, knowledge, and resources, along with the clinical expertise of healthcare professionals [18]. Interventions tailored to the learning needs of patients reduce care costs and enhance the quality of care [19]. Study results indicate that needs-based interventions help improve patient self-efficacy and certain aspects of health status [20]. Patient-centered education has been shown to (a) strengthen communication between patients and healthcare providers, (b) enhance adherence to medication and treatment plans, (c) reduce hospitalization rates, and (d) impact positively on positive changes in the health habits of patients with chronic diseases. Among hospitalized patients, those who understand their discharge instructions - including how to take their medications - are 30% less likely to be readmitted [17]. In another study, patient-centered education was shown to be effective in improving adherence to treatment regimens in patients with coronary artery disease. Consequently, patient-centered education can be recommended as a simple, cost-effective, and efficient technique in enhancing adherence to treatment regimens in patients with coronary artery disease [21]. In a review study, challenges such as neglecting empowerment interventions in MS patients, inattention to male patients in the implementation of interventions, lack of theoretical frameworks in interventions, and not utilizing interventions through virtual methods like DVD, counseling, telephone education, etc., were highlighted [22].

Telehealth has been proposed as a mechanism through which empowerment of chronic patients in self-management can be facilitated [23]. Telenursing is a component of telehealth where nurses use communication technologies, information, and web-based systems to address the healthcare needs of patients. Technologies that can be utilized in telenursing are diverse and include phones, personal digital devices, smartphones, fax machines, tablets, computers, the internet, audio and video conferencing, teleradiology, and computer information systems [24]. Examination of studies indicates that telenursing has been effective in altering health-related symptoms in patients. Therefore, telenursing technology can be utilized in clinical settings to promote mental health, education, and the advocacy of self-care behaviors. Telenursing is an effective method in nursing performance, including educational, clinical, psychological, and economic aspects [25]. A study demonstrated that telenursing can enhance the nurse-patient relationship, reduce costs associated with diabetes, and minimize the need for medical visits, ultimately leading to an improved patient condition [26]. The results of another study indicated that telenursing is effective in self-care and the quality of life for patients with MS [27]. The use of this technology leads to quick patient access to better services at lower costs, easy access to the most appropriate professional skills, and overall improvement in the quality of healthcare services [28].

The empowerment programs are often presented in a general manner and may not be based on the needs, desires, and understanding of the patients. Individualized empowerment considering the unique concerns of these patients is one of the key challenges in educating them. Attendance in long-term and in-person classes may be difficult or even impossible for them due to the consequences of the disease, such as fatigue, muscle weakness, and mobility issues. In such circumstances, telenursing-based methods can be employed. Therefore, a study was conducted to empower PwMS regarding their self-management, focusing on the patient-centered nature of the program and simultaneous implementation through telenursing.

Methods
Participants and setting
This study was a double-blinded, randomized clinical trial. The study was conducted from November 2022 to January 2023. The study population included all PwMS presenting to Iran MS Society. Using the OpenEpi calculator to determine the sample size for comparing two means, considering a 95% confidence interval, 80% statistical power, and standard deviations of 10.5 and 10.47 for the two groups, a sample size of 36 individuals in each group was calculated. Accounting for a 20% dropout, 45 individuals in each group were considered. This was obtained by dividing the calculated sample size [36] by one minus the dropout percentage (20%). In the end, a total of 90 PwMS were allocated to the intervention and control groups using block randomization method. Block randomization is a frequently employed method in clinical trial design, aiming to minimize bias and ensure balance in participant allocation to different groups, particularly when the sample size in small. The inclusion criteria were a definite diagnosis of MS for at least 6 months, age range of 18 to 60 years, ability to use a telephone and smartphone, no other physical or mental illnesses, and no cognitive or psychological disorders based on self-report and patient records. Our study was designed based on the common and debilitating symptoms that people with MS struggle with, and we did not intend to consider the course of the disease. From 111 PwMS who assessed for eligibility, six people who were over 60 years old and 5 individuals who had less than 6 months elapsed since the definite diagnosis of their disease were not included in the study. Additionally, the participants who were not able to continue the intervention due to reasons such as fatigue, unwillingness, or hospitalization could not follow the study (Fig. 1). Current study adheres to CONSORT guidelines.
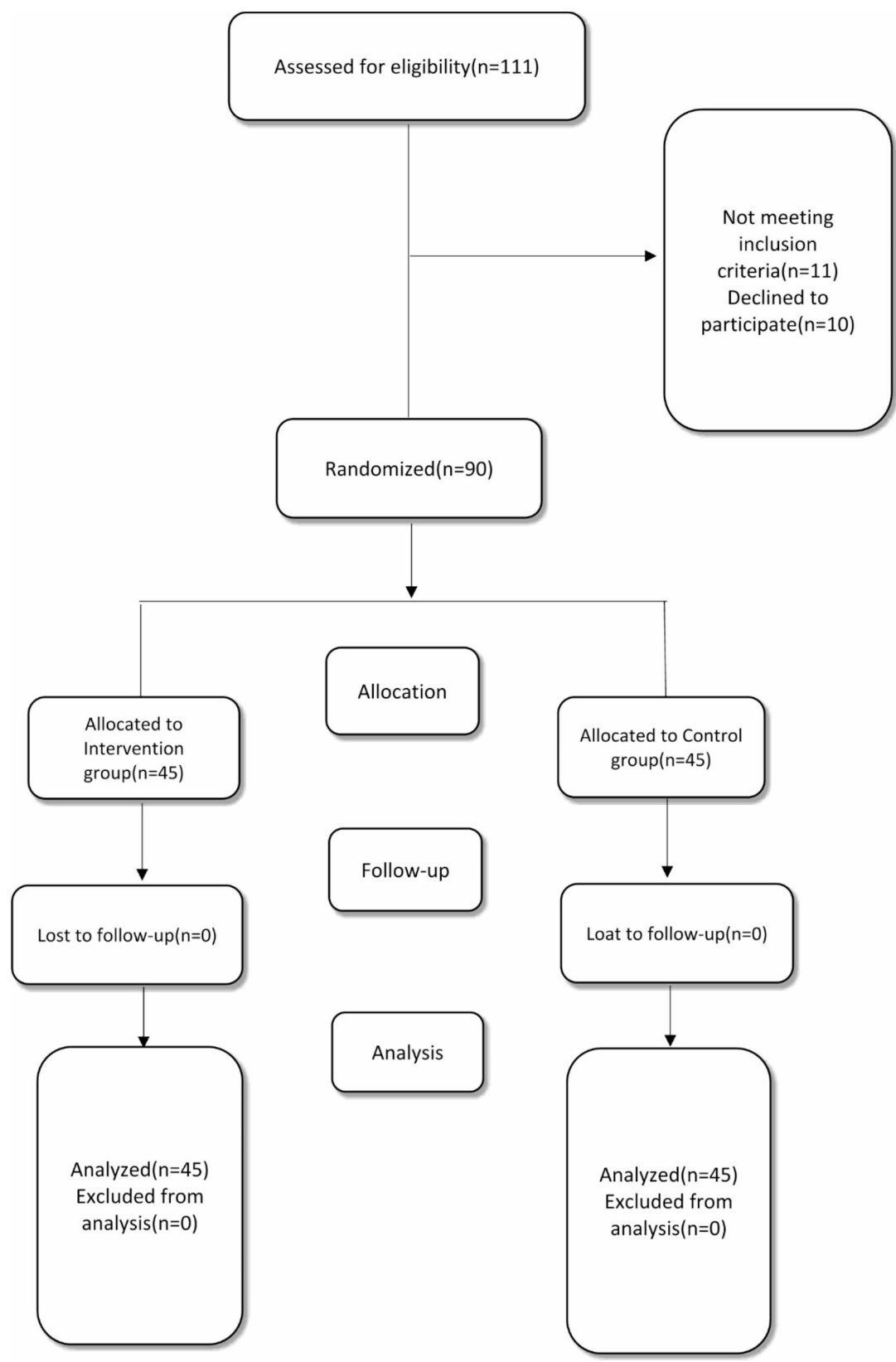
Fig. 1 Study Flow Chart CONSORT diagram

Data collection

Initially, research approval and ethical code were obtained. Then, after obtaining written consent, the samples were included in the study. Research samples were selected based on accessibility considering the inclusion criteria, and the allocation of samples to the two groups was done using block randomization. The participants were divided into two groups: intervention and control. Considering the sample size, 23 blocks of 4 were formed for block randomization and randomly selected using a dice. To conceal the random allocation from the researcher, a dark-colored envelope was prepared for each sample size, and the envelopes were numbered accordingly. For instance, the first envelope was numbered 1, and so on. Each sequence of randomly generated blocks was recorded on a card, inserted into an envelope, and sealed. During the registration of individuals in the study, based on the order of sample entry, one of the envelopes was opened in sequence to determine the group of that sample. Initially, both the control and intervention groups received a pre-test. The control group received routine care at the Iran MS Society. In addition to receiving routine care at the Iran MS Society, the intervention group also participated in the patient-centered empowerment program. At the end of the intervention, the educational content was provided to the control group as well. After 8 weeks from the end of the intervention, a post-test was conducted. The data before and after the intervention in both the intervention and control groups were examined and compared based on the research objectives.

The intervention in the present study was a patient-centered empowerment program in physical, psychological-emotional, and social dimensions, which was conducted in 5 educational sessions using telenursing (telephone counseling and online virtual methods via Skype in small groups and using WhatsApp for support and sharing materials in file format).

Subsequently, counseling sessions were conducted in a patient-centered and individualized manner based on the needs of PwMS. The number of counseling sessions varied depending on their needs and was carried out individually for each person. The content of the empowerment program is based on research literature from reputable sources, such as the MS Society of Canada, the MS Society of England and articles related to PwMS.According to the conceptual model of patient empowerment designed by Bravo et al. (2015), patient capacities was considered as an indicator of patient empowerment [29, 30] and self-management was measured as the primary outcome. For the validity of the educational content, the material was provided to 5 experts in caring for PwMS, and necessary modifications were made based on their feedback.

The content of the empowerment program for the intervention group in each session was presented as follows (Table 1).

The data collection tools included two questionnaires: a demographic characteristics questionnaire and the Multiple Sclerosis Self-Management Scale. The demographic characteristics questionnaire covered age, gender, income level, education, number of children, occupation, marital status, living arrangement, duration of illness, duration of membership in the MS society, housing type, and source of information.

The Multiple Sclerosis Self-Management Scale was first designed and validated by Bishop and Frain in the United States in 2007 and revised by the same authors in 2011. In 2014, it was validated in Iran by Ghahari et al. Again in 2020, it was customized by Saadat et al., and its psychometric analysis was conducted. The Revised Multiple Sclerosis Self-Management Scale consists of 24 items divided into five subscales: Healthcare Provider Relationship and Communication (6 items), Treatment Adherence/Barriers (7 items), Social/Family Support (3 items), MS Knowledge and Information (4 items), and Health Maintenance Behavior (4 items). The questionnaire scoring method is based on a 5-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neither agree nor disagree, 4 = agree, 5 = strongly agree). Higher scores indicate higher levels of self-management. Scores on this tool range from 24 to 120. The formal, content, and structural validity of the questionnaire are acceptable. Additionally, the reliability of the tool using Cronbach's alpha was determined to be 0.85 for Healthcare Provider Relationship and Communication, 0.79 for Treatment Adherence/Barriers, 0.79 for Social/Family Support, 0.71 for MS Knowledge and Information, 0.59 for Health Maintenance Behavior, and 0.85 for the internal consistency of the entire Multiple sclerosis self-management scale [14]. In the present study, the reliability of the tool was examined using ICC, and a value of 0.93 was obtained.

Data analysis

This study measured the effect of patient-centered empowerment program via telenursing on self-management and its various dimensions. The independent variable of the present study was the patient-centered empowerment program, and the dependent variables included self-management and its subscales: Healthcare Provider Relationship and Communication, Treatment Adherence/Barriers, Social/Family Support, MS Knowledge and Information, and Health Maintenance Behavior. Initially, the homogeneity of the background variables in the two control and intervention groups was examined. Mean, standard deviation, and comparison of means were assessed for continuous variables, and frequency,

Bayat *et al. BMC Neurology*   (2025) 25:138

Page 6 of 10

Table 1 Educational content of intervention sessions

Educational sessions	Educational titles	Educational strategy
Sessions one and two	*Physical Health Dimensions:* Nutrition and Diet– Sleep– Physical Activity and Exercise– Body Temperature Control– Fatigue and Its Management– Mobility Impairment and Falls– Vaccination– Unhealthy Habits (Alcohol, Smoking)– Women's Health (Menstrual Cycle, Menopause)– Pain and Its Management.	*Virtually via the Skype application through lectures (video conferencing).*
Sessions three and four	*Psychological and Emotional Health Dimensions:* Stress Management– Mood Control and Management– Resilience Enhancement - Problem-Solving Skills.	*Support sessions were conducted virtually via the WhatsApp application through question and answer sessions in the chat interface, posting voice messages, and sharing educational content files.*
Session five	*Social Health Dimensions:* Employment - Leisure Time - Community Participation and Social Functioning - Friendship and Social Networking - Household Lifestyle and Family Needs Identification (Role, Structure, Responsibilities, Goals, etc.	

percentage, and comparison of frequencies were conducted for categorical variables.

To test the conformity of data distribution with the normal distribution, the Kolmogorov-Smirnov test was used. Additionally, the comparison of mean scores before and after the intervention in each group was conducted using the paired samples t-test. The comparison of mean scores between the control and intervention groups at each time point was performed through the independent samples t-test. Moreover, the ANCOVA test was utilized to control for heterogeneous factors and also the effect of pretest scores. Data analysis was carried out using SPSS version 26 software, and a significance level of 0.05 was considered for all tests.

Results

In this study, data from 90 individuals with MS attending the MS Society of Iran were analyzed. Findings indicated that the majority of the study participants were female (62.2%) and married (55.6%). Moreover, the results of the chi-square test revealed non-significant differences in the frequency of women and men, marital status, living situation, and income level between the intervention and control groups, indicating homogeneity between the two groups in these variables. Further details are presented in Table 2.

To control for non-homogeneous factors such as age, disease duration, and occupation, as well as to control for the effects of pre-test scores of self-management, the ANCOVA test was utilized. Regarding the subscales of self-management scale, the results of the ANCOVA test showed that there were no significant differences between the adjusted means of scores for Healthcare Provider Relationship and Communication, Treatment Adherence/Barriers, and Social/Family Support between the control and intervention groups. Therefore, even after controlling for non-homogeneous factors, no significant difference was observed between the intervention and control groups.

Regarding the other two subscales of the self-management scale, including MS Knowledge and Information and Health Maintenance Behavior, the results of the ANCOVA test indicated a significant difference between the adjusted means of these two subscales between the intervention and control groups after controlling for non-homogeneous factor. Finally, the ANCOVA results showed a significant difference in the adjusted means of self-management scores between the control and intervention groups ($P = 0.01$). The calculated effect size indicates a medium effect (Cohen's d = 0.56). (Table 3).

Bayat *et al. BMC Neurology*   (2025) 25:138

Page 7 of 10

Table 2 Demographic characteristics of participants in intervention and control groups

Variable		Frequency (%)		P Value
		Intervention	Control	
Sex	Male	15(33.33)	19(42.22)	*P=0.384
	Female	30(66.67)	26(57.78)	
Marital status	Single	12(26.67)	17(37.78)	*P=0.415
	Married	26(57.78)	24(53.33)	
	Widow/widower	7(15.56)	4(8.89)	
Living status	Alone	8(17.78)	5(11.11)	*P=0.402
	With spouse	10(22.22)	13(28.89)	
	With spouse and children	16(35.56)	11(24.44)	
	With parents	11(24.44)	16(35.56)	
Income	Insufficient	11(24.44)	14(31.11)	*P=0.68
	Relatively sufficient	24(53.33)	20(44.44)	
	Sufficient	10(22.22)	11(24.44)	
Education level	Elementary school	1(2.22)	1(22.22)	**P=0.513
	Junior high school	1(22.22)	1(2.22)	
	High school	12(26.67)	7(15.57)	
	University	31(68.89)	36(80)	
Number of children	Without children	22(48.89)	30(66.67)	**P=0.107
	One child	11(24.44)	10(22.22)	
	Two children	11(24.44)	4(8.89)	
	Three children	0(0)	1(2.22)	
	Four children	1(2.22)	0(0)	
Occupation	Self-employed	10(22.22)	12(26.67)	**P=0.007
	Employee	6(13.33)	20(44.44)	
	Retired	5(11.11)	3(6.67)	
	Jobless	7(15.56)	2(4.44)	
	Housewife	16(35.56)	7(15.56)	
	Worker	1(2.22)	1(2.22)	
Source of information	Books and magazines	2(4.44)	0(0)	**P=0.223
	Internet	20(44.44)	25(55.56)	
	MS Society	7(15.56)	10(22.22)	
	Physician	16(35.56)	10(22.22)	
Age (year)	Mean±SD	39.44±8.55	36.16±6.66	***P=0.045
Disease duration (year)	Mean±SD	12.53±6.96	8.36±5.29	***P=0.002

* Chi square test ** Fisher's test ***Independent t test

Discussion

This study aimed to determine the impact of a patient-centered empowerment program via telenursing on self-management in PwMS. The findings indicated that the patient-centered empowerment program through telenursing was effective in enhancing self-management in PwMS. Our focus in this study was on empowering PwMS through a patient-centered empowerment program and utilizing telenursing to maximize the impact of this empowerment. This approach may be more effective compared to other methods of implementing empowerment programs due to the limitations and challenges associated with this condition. The findings of a study consistent with a systematic review indicate that a patient-centered care approach, which focuses on self-management and considers the patient as a whole individual, is associated with improvements in psychological health status and individuals' ability to manage their conditions. These findings align with the results of our research [30]. The empirical results from a study clearly demonstrate improvements in the average blood glucose control among patients receiving a patient-centered program after 12 months compared to patients receiving routine and standard educational programs. This study suggests that a patient-centered program can lead to better outcomes regarding the impact of preventive health policies for most patients with healthy, high, or very high glycemic levels [18]. Another study asserts that their findings, consistent with previous research, reinforce the evidence that physicians' efforts to integrate patients' cultural values, needs, and preferences enhance the patient-provider relationship and can have a positive impact on treatment adherence behavior [31].

Bayat *et al. BMC Neurology*   (2025) 25:138

Page 8 of 10

Table 3 Comparison of the mean scores of MS Self-Management scales and its subscales between and within intervention and control groups

Variable	Time	Mean ± SD		*P* Value	Cohen's d (CI95%)
		Intervention	Control		
Self-management	**Pre-test**	88.09 ± 11.81	87.91 ± 11.07	*P* = 0.94*	
	Post-test	91.62 ± 11.14	88.51 ± 11.27	**P** = 0.01**	0.56 (0.0901 – 1.03)
Healthcare Provider Relationship and Communication	**Pre-test**	23.02 ± 5	22.58 ± 4.97	*P* = 0.68*	
	Post-test	23.62 ± 4.42	22.93 ± 4.6	**P** = 0.89**	0.008(-0.453 – 0.469)
Treatment Adherence/ Barriers	**Pre-test**	26.06 ± 3.7	25.68 ± 3.62	**P** = 0.60*	
	Post-test	26.96 ± 3.4	26.09 ± 3.68	**P** = 0.33**	0.209(-0.252 – 0.670)
Social/Family Support	**Pre-test**	9.53 ± 3.12	9.87 ± 3.22	**P** = 0.62*	
	Post-test	9.96 ± 3.25	9.76 ± 3.11	**P** = 0.091**	0.407(-0.0559 – 0.870)
MS Knowledge and Information	**Pre-test**	15.36 ± 1.77	15.04 ± 2.58	**P** = 0.51*	
	Post-test	15.82 ± 1.28	14.89 ± 2.4	**P** = 0.007**	0.734(0.261 – 1.21)
Health Maintenance Behavior	**Pre-test**	14.36 ± 3.45	14.67 ± 3.32	**P** = 0.66*	
	Post-test	15.27 ± 2.87	14.84 ± 3.37	**P** = 0.002**	0.632(0.162 – 1.10)

* Independent t test

** ANCOVA

A study (2019) indicated that the effect of a psychological education program on self-management in women with MS. The results of this study showed that the psychological education intervention had a significant effect on improving self-management (overall score) and its subscales. The impact of this psychological program on self-management and subscales related to MS Knowledge and Information and Health Maintenance Behavior was entirely consistent with our study. However, in another study, the effect of psychological intervention on subscales related to Healthcare Provider Relationship and Communication and Treatment Adherence/Barriers was found to be incongruent with our findings. The reason for this discrepancy can be attributed to the type of interventions conducted in the two studies [32]. In this regard, Hemmatpoor and colleagues (2018) also reported that life skills training led to improved self-management and its subscales such as Treatment Adherence, Healthcare provider Relationship and Communication, Social support, and MS knowledge and Information in MS patients. Their results regarding self-management and the subscales of MS Knowledge and Information were completely consistent with the present study. However, concerning the subscales of Treatment Adherence, Social Support, and Healthcare Provider Relationship and Communication, their findings were incongruent with our study [33]. In a study (2018) found that self-care education did not play an effective role in the social adaptation of MS patients. In the present study, no change was observed in some subscales [34] In another study, obtaining information about MS was identified as a key factor in self-management for adapting to MS. As evidence has shown, acquiring information about MS is crucial for disease adaptation and acceptance. Lack of awareness about MS has been cited as one of the obstacles to self-management, which is consistent with the present study [35]. Furthermore, our research findings indicated that the patient-centered empowerment program through telenursing was effective in promoting health maintenance behaviors and increasing knowledge about MS, which are subscales of self-management in patients with MS. A study examining the effectiveness of telephone interventions on fatigue, physical activity, and quality of life outcomes in adults with MS supported this, suggesting that group telephone conferences followed by appropriate telephone calls have a small yet statistically significant impact on improving physical activity and reducing fatigue in individuals with MS. This is an important finding due to the high rate of immobility in the MS population and the moderate effects of current medications on fatigue management. The findings of this study are consistent with our research in terms of the health maintenance behavior [36]. In a study in 2018, the impact of telenursing (telephone follow-up) and self-management education for diabetes over a period of 12 weeks on fasting blood glucose levels was investigated. According to their results, telenursing (telephone follow-up) was able to have a positive effect on fasting blood glucose levels, keeping them within the normal range [37]. Another study showed that remote health self-management interventions can be beneficial in various ways for the health of patients with heart failure [38]. In another study (2023), the impact of self-care education with a telenursing approach on health-promoting behaviors in patients with MS was examined. According to the findings of this research, self-care education with a telenursing approach was effective in promoting health-enhancing behaviors in MS patients, which corroborates the results of the present study [39].

Strengths and limitations

The intervention in this study was developed based on personalized care and tele-nursing, which are key strengths. Tele-nursing offers individuals the convenience of accessing healthcare services from their homes, reducing the physical burden associated with in-person visits and allowing for greater flexibility in scheduling appointments. Moreover, personalized care ensures that they receive tailored guidance and support, addressing their unique needs and challenges. However, the study has some limitations. First, the sample size was relatively small, and the use of non-probability methods may introduce some selection bias. While the findings provide valuable insights into the effect of the patient-centered empowerment program through tele-nursing on self-management in PwMS, the results should be generalized carefully to the target population. To address this limitation, we calculated Cohen's d and its 95% confidence interval, as well as the observed power for each statistical tests. Also, the present study was conducted in a single center, there is a need for further investigations with different designs, settings, and sample sizes to better generalizability. Furthermore, the first author's awareness of allocation during intervention execution may have introduced performance bias.

Conclusion

Given the results of the present study, the patient-centered empowerment program through telenursing can have positive effects on improving the self-management level of PwMS. Based on this, the patient-centered empowerment program, considering the prevalence of MS, can be positioned as a cost-effective, and efficient method for healthcare planners to enhance the self-management level of PwMS. It is recommended that this program also be implemented as a family-centered empowerment program. The study participants were selected from PwMS; hence, it is suggested that similar studies be conducted to empower patients through telenursing for the self-management of other chronic diseases.

Abbreviations
MS   Multiple sclerosis
PwMS   People with multiple sclerosis

Supplementary Information
The online version contains supplementary material available at https://doi.or g/10.1186/s12883-025-04148-x.

Supplementary Material 1

Author contributions
FB, ShP and RN: design of study; FB: acquisition of data; RN: data analysis; FB, ShP and RN: drafting the manuscript; All authors assisted in revising the text and approved the final manuscript.

Data availability
No datasets were generated or analysed during the current study.

Declarations

Ethics approval and consent to participate
The Ethics Committee of Tehran University of Medical Sciences, Tehran, Iran, approved this study (code: IR.TUMS.FNM.REC.1400.083) and, this study has been registered and approved in the Iranian Registry of Clinical Trials Center (code: IRCT20210824052281N1) on 2021/09/13. Participants were provided with written informed consent, clear explanations about the study aim, data confidentiality, and voluntariness of participation in and withdrawal from the study.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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