Mental Health Literacy and Health Promoting Behaviors among Patients with Multiple Sclerosis: a Cross-Sectional Study

ABSTRACT

Background and Objectives: Multiple sclerosis (MS) is a chronic disease that leads to both physical limitations and neuropsychological disorders. This study aimed to determine the relationship between mental health literacy (MHL) and health promoting behaviors (HPB) in patients referred to the comprehensive multiple sclerosis center of Mashhad city, in 2022.

Materials and Methods: This cross-sectional study was performed on 230 patients referred to the comprehensive multiple sclerosis center of Mashhad city, in 2022. The sampling method was simply random and participants were easily selected. The data instrument was self-report questionnaires including demographic information, the mental health literacy questionnaire (MHLQ), and Walker's Health-Promoting Lifestyle Profile II (HPLP II). The data were analyzed using SPSS version 22 software.

Results: The results showed there was a significant correlation was found between the MHL in multiple sclerosis patients and HPB ($r=0.690$, $P<0.001$). Also, other dimensions of HPB had a positive and significant relationship with MHL.

Conclusion: The existence of a statistical relationship between MHL and HPB in people with multiple sclerosis emphasizes the importance of assessing MHL and increasing it in order to improve HPB.

Paper Type: Research Article

Keywords: Mental Health Literacy, Health Promoting Behaviors, Multiple Sclerosis

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Introduction

Multiple sclerosis (MS) is an autoimmune disease of the central nervous system and a common cause of neurological disability in young adults (1). MS is an inflammatory and neurodegenerative disease that affects approximately 2.8 million people worldwide (2, 3). The incidence of MS is increasing worldwide, as is the social and economic impact of the disease (4). Patient knowledge is very important when dealing with MS, and correct knowledge is associated with less fear of disease progression (5). Having correct information and relevant health literacy (HL) is effective in managing symptoms and problems and improving the overall quality of life of people living with MS (6).

The World Health Organization (WHO) reports that HL appears to be the most important component of the social determinants of health (SDH), stating that it is "a stronger predictor of a person's health status than income, occupational status, education, and race or ethnic group" (7).

Studies show that increased HL is associated with improved self-management behaviors such as diet, adherence to medication, and lifestyle modification recommendations (8). One study showed that insufficient HL increases the inefficiency of health care (9).

Mental health literacy (MHL) is a construct that emerged from the field of HL and should be understood in the same context (10). Individuals' symptom management activities are influenced by MHL (11). MHL is defined as knowledge and beliefs about mental disorders that help to recognize, manage or prevent them (12). MHL is important for healthy life, but many studies have shown that insufficient MHL is common among people (13). Low MHL delays patients seeking help and prevents appropriate care processes (14). Studies emphasize psychoeducation in MS settings along with efforts to increase MHL (15).

Increasing MHL is related to the reduction of some mental disorders, such as depression, stigma, and social exclusion, and can encourage help-seeking behaviors (16).

One of the most important factors determining an individual's health status is health promotion, which considers the individual responsible for their own health. One of the main strategies to improving health and prevent diseases is to pay attention to health promoting behaviors (17).

Health-promoting behaviors (HPBs) are important and necessary strategies that help maintain and promote the health and quality of life of people with chronic diseases (18). The purpose of HPBs is to empower people to improve their lifestyles and gain more control over their health (19). Studies have shown that people with high levels of MHL are more aware of health issues and health risk factors and are more likely to engage in all measures of HPBs (20). This incites the question of whether there is a relationship between MHL and HPBs in people with MS.

Although the importance of individual and community HL has long been recognized, less work has been done on MHL, i.e. the ability to diagnose, manage, and prevent mental illness (21). On the other hand, studies have shown that HPB levels are lower in people living with MS than in healthy individuals (18). The novelty of this study lies in the generation of new insights into the interaction between MHL and HPB in MS patients.

Considering the prevalence of MS, it is necessary to understand the relationship between MHL and HPBS to prevent the progression of MS and develop community-based interventions to prevent mental disorders (12). This study aimed to determine the relationship between MHL and HPBS in patients referred to the comprehensive multiple sclerosis center of Mashhad city, in 2022.

Materials and Methods

This cross-sectional study in accordance with the STROBE guidelines (Supplementary material 1) was performed on 230 patients referred to the comprehensive multiple sclerosis center of Mashhad city in the period from 22 st October to 29th December 2022. The sampling method was simply random. Inclusion criteria, including the medical diagnosis of relapsing-remitting multiple sclerosis (RRMS) (22), expanded disability status scale (EDSS) ≤5 (the expanded disability status scale (EDSS) is a method of quantifying disability in multiple sclerosis and monitoring changes in the level of disability over time) (23), informed consent to participate in the study, the ability to understand the material (at least elementary education) and complete the questionnaire. Exclusion criteria included hearing and vision problems, systemic diseases, involvement of a neurological or psychiatric disease other than MS, and dropping out of the study for any reason that prevented participants from participating in the study.

Participants and recruitment

To select the sample size, the number of patients referred to the comprehensive MS center was determined. The participants were randomly selected based on the inclusion criteria. Before completing the information, the goals and importance of the study were explained to the participants. Based on the sample size formula in the correlation studies in clinical research (24) and taking into account the confidence interval of 95% and the test power of 80% and the possible loss of 10%, the sample size was estimated to be 230 people. Using a simple random sampling method, 230 patients were selected and evaluated based on inclusion criteria. Among the participants, 9 did not meet the entry criteria, and 16 were excluded based on the exit criteria. Five questionnaires were discarded because they were incomplete (Figure 1).

Measures

The study data were collected using 3 self-report questionnaires, as described below.

1. The first part includes demographic information, including age, gender, marital status, educational level, occupational status, place of residence, duration of illness, age of onset of illness, and monthly income.

2. The second part includes the mental health literacy scale (MHLS) (2018), included a total of 29 items with four attributes consisted of (a) the ability to recognize disorders (11 items), (b) wrong beliefs about mental health (8 items), (c) seeking help and first aid skills (6 items), and (d) self-help strategies (4 items).

The questions of the mental health literacy questionnaire (MHLQ) are scored using a five-point Likert scale always (5), most of the time (4), sometimes (3), rarely (2), and not at all (1). The number 1 represents the lowest score and the number 5 represents the highest score. The reliability and validity of MHLQ have been measured by Zarebi et. Al

25 in Iranian society. This study showed that this tool has adequate construct validity and its reliability and content validity ratio (CVR) are 0.81 and 0.67, respectively. A CVR greater than 0.6 and a Cronbach's alpha value greater than 0.7 are considered appropriate (26).

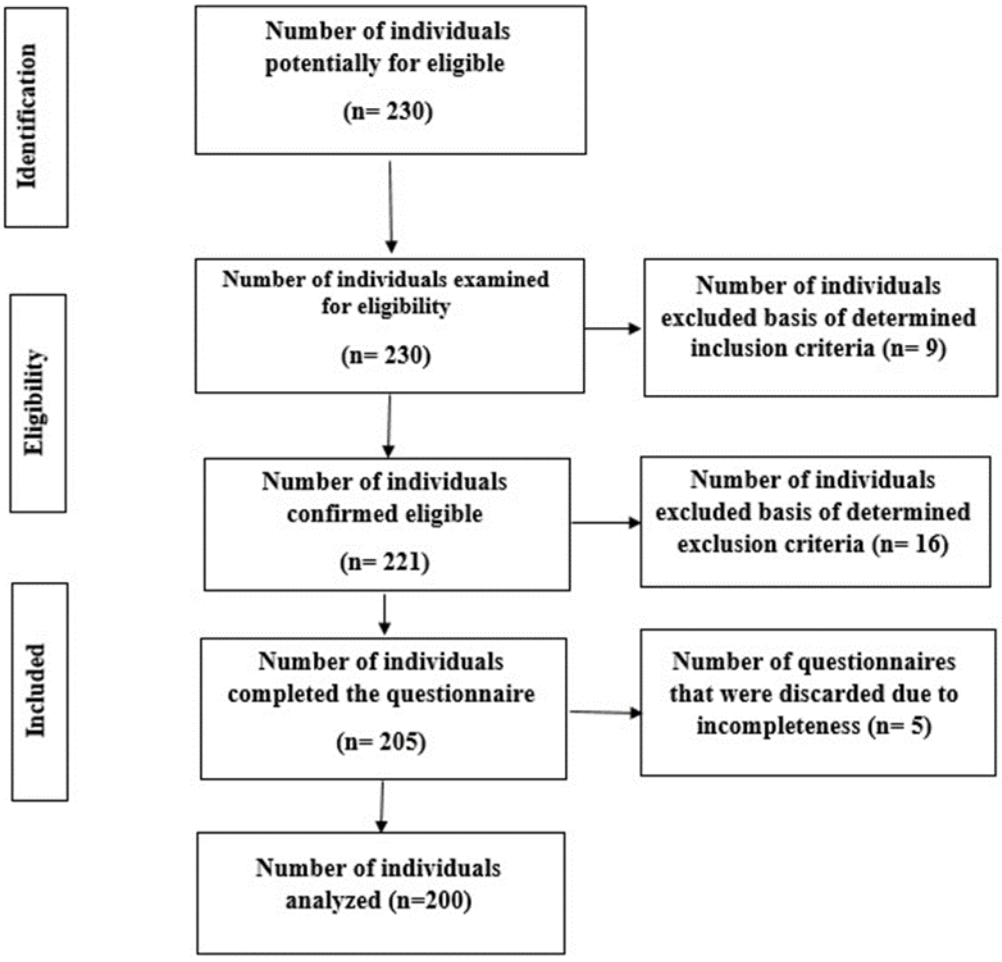

Figure 1. Flow diagram of the study

A high score for each MHL attribute indicates a higher literacy rate for each attribute. Also, the total score of MHLS is calculated from the sum of the scores of all attributes. The lowest and highest MHL scores were 29 and 145, respectively.

The third part includes Walker's Health-Promoting Lifestyle Profile II (HPLP II) questionnaire.This instrument was developed by Walker et al. in 1995 (27) and contains 52 items that are assessed on a 4-point Likert scale (never, sometimes, often, and always) and measures 6 dimensions. Each subscale includes of several items (nutrition: nine items; physical activity: eihght; health responsibility: nine; stress management: eihght; interpersonal relationship: nine; and spiritual growth: nine). The total score of the HPLP II ranges from 52 to 208 (27). HPLP II validated in MS patients in Iran. The Cronbach's alpha coefficient was calculated as 0.82 (28).

A high score for each HPLP dimension indicates a higher Health promoting

behaviors rate for each dimension. Also, the total score of HPLP is calculated from the sum of the scores of all dimensions.

The questionnaires were completed at the comprehensive MS center and returned right away.

The duration of completion of the questionnaire varied from 10 to 15 minutes. Both questionnaires have been validated in Iran's cultural context and are the most distinctive tools used in Iranian society.

The data analyzed using SPSS version 22 software and independent samples t-tests, one-way analysis, Pearson's correlation coefficient and multiple linear regression. A significance level of 0.05 was considered.

Results

The results showed that the participants' mean age was 37.30±8.02 years. More than half of them and approximately 70.5 % of the participants were female, 95% of participants were residents of the city, and 33.5% of the participants were Bachelor's degree. The sociodemographic characteristics are presented in Table 1.

Descriptive statistics for the MHL and HPB were shown in table 2. The findings showed that the mean score of HPLP was 82.49 ±1.42. The highest and lowest scores in HPLP belonged to nutrition (33.26±6.46) and physical activity (5.7±1.33), respectively. The findings showed that the mean score of MHL was 103.28 ±15.65. The highest and lowest scores in MHL belonged to ability to recognize disorders (39.67±6.27) and self-help strategies (14.15±3.11), respectively (Table 2).

The results of the independent samples t-tests revealed there was no significant relationship between gender and HPB (P=0.39) and MHL (P=0.47), respectively. Also, the findings of the independent samples t-tests showed there was no significant relationship between marital status and HPB (P=0.30) and MHL (P=0.15), respectively. The results of the ANOVA test revealed that participants with elementary education showed statistically lower levels of MHL, compared with other participants (P<0.001). Moreover, participants that had duration of disease >20 years showed higher levels of MHL (P=0.005). The findings showed that the participants with duration of disease > 20 years and onset age <25 years had higher levels of HPB (P=0.001) (Table 3).

The Pearson correlation results showed that there was a significant positive correlation between MHL and total HPB (r=0.614, p<0.001). The results of this test showed that there was a significant positive correlation between MHL and subscales of HPB, so that there was a significant positive correlation between MHL and nutrition (r=0.625, p<0.001), physical activity (r=0.477, p<0.001), health's responsibility (r=0.660, p<0.001), stress management (r=0.545, p<0.001), interpersonal relationships (r=0.188, p<0.001) and spiritual growth (r=0.191, p<0.001), respectively. Moreover, the highest level of association between MHL and dimensions of HPB was related to health's responsibility.

The results also showed a significant positive correlation MHL and its attributes (p<0.001). Based on the results, there was a significant positive correlation between HPB and its subscales (p<0.001). Other results presented in Table 4.

Table1. Subject demographic and clinical characteristics

Variables		N (%)
Gender	Female	141 (70.5)
	Male	59(29.5)
Marital status	Single	56(28)
	Married	144(72)
Educational level	Elementary	4(2)
	Under diploma	31(15.5)
	Diploma	51(25.5)
	Associate Degree	15(7.5)
	Bachelor's degree	67(33.5)
	Master's degree and above	32(16)
Occupational status	Housewife	79(39.5)
	Employee	33(16.5)
	Self-employment	31(15.5)
	Unemployed	26(13)
	Worker	7(3.5)
	Retired	11(5.5)
	Other	6.5(13)
Place of residence	City	190(95)
	Village	5(10)
Income	No income	98(49)
	1-4 million	24(12)
	5-8 million	22(11)
	≥ 9 million	56(28)
Duration of disease	1-5 years	54(27.50)
	5-10 years	43(21.15)
	10-15 years	30(15.00)
	15-20 years	21(10.05)
	> 20 years	52(26.00)
Onset Age	<25 years	62(31.00)
	20-30 years	71(35.50)
	30-40 years	48(24.00)
	40-50 years	15(7.5)
	>50 years	4(2.00)

Table 2. Means, Standard Deviations, Minimum, and Maximum of HPLP and MHL and its Subscales (N=200)

Variables	Mean± SD	Min-Max	Rang scale
a	39.67±6.27	27-55	11-55
b	27.68±4.9	18-38	8-40
c	21.59±3.67	13-29	6-30
d	14.15±3.11	8-20	4-20
MHL	103.28±15.65	35-145	69-145
g	33.26±6.46	18-46	9-36
h	5.7±1.33	3-8	8-32
i	23.31±4.90	13-32	9-36
J	14.44±3.06	6-21	8-32
K	16.27±5.09	8-24	9-36
l	5.75±1.43	2-8	9-36
HPLP total score	82.49±1.42	52-109	52-208

MHL Subscales: Ability to recognize disorders (a), Wrong beliefs about mental health(b), Seeking help and first aid skills (c), Self-help strategies (d); HPLP Subscales: Nutrition (g), Physical activity (h), Health's responsibility(i), Stress management (j), Interpersonal relationships(k), Spiritual growth(l)
SD: standard deviation, MHL: Mental Health Literacy, HPLP: Health Promoting Behaviors

Table3. Independent T Test and One-way ANOVA analysis of socio-demographic characteristics with MHL, HPLP and its Subscales (N=200)

Variables		MHL	HPLP
Gender	Female	102.59±15.73	83.04±13.73
	Male	104.34±16.03	81.16±15.56
	T-value	0.713	-1.012
Marital status	Single	100.57±14.94	80.78±14.95
	Married	104.09±16.06	83.15±14.01
	T-value	-1.417	-0.012
Educational level	Elementary	100.50±11.03	78.75±10.87
	Under diploma	103.23±18.04	80.45±15.10
	Diploma	102.40±16.50	83.27±15.32
	Associate Degree	105.40±19.79	82.26±15.18
	Bachelor's degree	102.25±14.17	81.94±14.23
	Master's degree and above	130.43±16.06	84.96±12.20
	F-value	0.771a	2.222
Occupational status	Housewife	101.46±16.22	81.91±14.80
	Employee	104.42±15.80	84.42±12.59
	Self-employment	101.03±14.66	79.74±16.04
	Unemployed	103.50±16.06	81.30±14.90
	Worker	106.00±10.63	86.85±4.98
	Retired	106.64±19.95	85.63±17.46
	Other	109.38±14.48	85.07±9.97
	F-value	0.740	1.761
Place of residence	City	103.14±15.82	79.97±12.87
	Village	102.5±16.21	75.40±14.03

Variables		MHL	HPLP
	T-value	0.124	0.186
Income	No income	101.92±16.68	81.68±14.20
	1-4 million	105.04±12.36	85.83±13.71
	5-8 million	104.50±13.79	82.00±14.67
	≥ 9 million	103.80±16.45	82.67±14.66
	F-value	0.394	2.144
Duration of disease	1-5 years	94.01±10.01	77±14.01
	5-10 years	100.03±8.20	80.06±11.01
	10-15 years	102.20±9.20	76.01±10.01
	15-20 years	94.03±10.03	76.04±9.01
	> 20 years	111±12.80	95.07±11.01
	F-value	1.038 a	5.911 a
Onset Age	<25 years	108.06±19.01	150±14.01
	20-30 years	100.01±10.50	147.01±11.01
	30-40 years	98.02±11.22	136.00±10.01
	40-50 years	90.03±12.07	120.04±9.01
	>50 years	82.01±14.01	122.07±11.01
	F-value	0.821 a	2.480 a

p≤0.001a

The multiple linear regression model showed that 52% of the changes in HPB were explained by demographic variables and MHL (R2=0.52, F=69.92, p<0.01). The multiple linear regression models showed that educational level (P<0.001), income (P=0.012) and MHL (P<0.001) significantly predicted HPB, such that as education level, income and MHL score increased, so did HPB in MS patients. The best predictor of HPB was MHL (Table 5).

Discussion

The purpose of this study was to investigate the correlation between MHL and HPBs among people living with MS, in northeastern Iran.

The results of the present study provided some insights in to the association between MHL scores and HPB. Also, the findings indicated that some socioeconomic characteristics were predictive factors for MHL and HPB among people living with MS in Mashhad city.

The results showed that 70.5% of the participants were female. This finding is consistent with previous studies that the number of female patients exceeds that of male patients by 3 to 4 times (29). The increasing incidence of MS in females therefore suggests that more attention should be paid to the characteristics of women.

In our study, the mean age of participants was 37.30 years, so the majority of MS patients were middle-aged adults. This could be due to the a fact that a number of factors related to adulthood, such as employment status and income (30) or marriage, are the most important determinants of a person's future life, and failure in any of these areas can be a source of stress (31).

Table 4. Pearson correlation between attribute of mental health literacy and health promoting behaviors

Variables		a	b	c	d	e	f	g	h	i	j	k	l
Attribute of MHLS	Ability to recognize disorders (a)	1											
	Wrong beliefs about mental health (b)	0.763**	1										
	Seeking help and first aid skills (c)	0.722**	0.574**	1									
	Self-help strategies (d)	0.651**	0.718**	0.621**	1								
Total mental health literacy (e)		0.931**	0.890**	0.821**	0.824**	1							
Total health promoting behaviors(f)		0.563**	0.552**	0.471**	0.552**	0.614**	1						
Subscales of health promoting behaviors	Nutrition (g)	0.560**	0.564**	0.411**	0.663**	0.625**	0.859**	1					
	Physical activity (h)	0.402**	0.458**	0.287**	0.548**	0.477**	0.472**	0.502**	1				
	Health's responsibility(i)	0.636**	0.563**	0.525**	0.558**	0.660**	0.874**	0.701**	0.475**	1			
	Stress management (j)	0.529**	0.455**	0.497**	0.397**	0.545**	0.850**	0.654**	0.368**	0.677**	1		
	Interpersonal relationships(k)	0.178**	0.195**	0.161*	0.095	0.188**	0.737**	0.408**	0.043	0.524**	0.621**	1	
	Spiritual growth(l)	0.073	0.219**	0.239**	0.192**	0.191**	0.553**	0.331**	0.068	0.414**	0.491**	0.502**	1

* p<0.005, **p<0.001

Table 5. Multiple linear Regression model of Health-Promoting Lifestyle Profile and Mental Health Literacy with socio-demographic characteristics

Variables	HPLP			
	B	Std. Error	Beta	P value*
Constant	62.828	14.59		P<0.001
Age	-0.205	0.225	0.094	0.5790
Gender	0.733	2.816	0.019	0.795
Marital status	1.632	2.769	0.042	0.556
Educational level	0.408	0.572	0.420	0.015
Occupational status	0.038	0.665	0.004	0.966
Place of residence	5.409	5.337	0.067	0.325
Income	0.467	1.753	0.380	.012
Duration of disease	0.248	0.252	0.087	0.325
Onset Age	0.043	0.167	0.025	0.797
MHL	0.438	0.056	0.506	P<0.001

Multiple linear Regression

The results of this study showed that there was no significant relationship between marital status with MHL and HPB. In contrast, one study reported a positive association between marital status and HPB (20).

The results of this study showed that there was no significant relationship between gender with MHL and HPB. Similarly, other studies have reported no significant relationship between gender and with MHL and HPB (32, 33)

This study showed that the participants in the Elementary study statistically had the lowest level of MHL. Thus, patients with higher education had higher MHL levels.

The results of various studies have shown that there is a significant relationship between the level of education and MHL. AS the level of education increases, the level of MHL also improves (34, 35).

The results of this research showed a significant relationship between the duration of the disease and MHL. In contrast, one study showed a negative and weak association between disease duration and HL (36). One of the possible reasons for these differences the use of different instruments for MHL and their application in different cultures (37). Some studies suggest that a person's health literacy may vary depending on the conditions and context (38).

Our results show that HPB scores were higher with a disease duration of more than 20 years and an age at onset of less 25 years. Other studies have also shown that there is a significant relationship between disease duration and HPB (39, 40).

Research notes that the benefits of public knowledge of physical illness are widely recognized, knowledge of MHL (41). The review article suggests that one of the influencing factors on HPB is MHL (42). The results of one study showed that people with higher MHL had higher HPBs (20).

HPB are the most important factors that influence MS patients' abilities and stimulate displacement. They are forgotten abilities that enable MS patients to overcome their disabilities (31).

The results showed that there was a significant direct association between MHL and HPB in people living with MS. Consistently, other studies, a significant association was found between health literacy and HPB (43, 44).

Multiple regression analyses showed that MHL was a significant predictor of HPBs. Another study also emphasized the predictive role of MHL in HPBs (20). The present study showed that education level and income significantly predicted HPB. Other studies have also shown that education and economic status are predictors of health-promoting behaviors (45).

The results of the present study showed that the highest MHL score is the ability to diagnose disorders. Similar findings were observed in other studies that have evaluated MHL. These studies also showed that many participants were aware of the symptoms of mental illness (46).

The results of the study showed that the highest correlation between MHL and HPB dimensions is related to health responsibility. The highest and lowest scores in HPLP belonged to nutrition and physical activity. Other studies have similarly shown that nutrition and physical activity scores are the highest and lowest dimensions of health-promoting behaviors, respectively (20, 47). Meta-analyses and systematic reviews research have shown that MS patients who engage in physical activity experience immune cell and quality of life benefits. The various studies show that physical activity is an effective strategy for tertiary, secondary and primary prevention (48). But unfortunately, MS patients are much less active than healthy controls. A recent study found that participation in an exercise program is higher when patients involve a physician, and qualitative research shows that many providers lack the expertise to do so (49). Therefore, it appears that one of the reasons for the lack of physical activity in MS patients is the lack of expert information among caregivers. It is therefore suggested that training programs for caregivers should be implemented. Healthcare providers should subscribe and promote the safety and benefits of physical activity for people living with MS (48).

The results of the present study showed that there is a positive and significant correlation between MHL and health-promoting behaviors.

The results of one study also reported a significant relationship between MHL, HPLP, and all subscales (20).

Cultural practices and beliefs of patients affect their coping style with challenges (3).

Increasing the public culture of health literacy and providing health information is effective in empowering individuals to make better decisions and maintain health.

Increasing the general culture of people regarding health literacy can be of great help in changing the lifestyle of people in society (50). If investments are made to increase people's health literacy, in addition to controlling diseases and the general health of the people, it is possible to prevent the imposition of several times the cost of the health system (50).

Study Limitations and Strengths: The strength of this study is that it measured MHL and HPB people living with MS in the city of Mashhad northeastern Iran. This is a strength

because MHL has been little studied in MS patients.

Our study also contains limitations. One of the most important limitations is the cross-sectional design of the study. MHL and HPB were only studied cross-sectionally, so we could not obtain information on existing causal relationships. The mental and emotional states of the patients at the time of completing the questionnaires and their honesty in answering the questionnaires were limitations beyond the control of the researchers. We relied on self-reported measures. There is potential for bias in the estimated values due to social desirability bias and participants' perceptions. Another limitation of this study is the lack of a protocol to avoid publication bias and greater transparency and integrity in research. Another limitation of this study is the lack of a protocol to avoid publication bias and greater transparency and integrity in research.

Conclusions

There was a significant direct association between MHL and HPB people living with MS sclerosis living in Mashhad. These results indicate that MHL is effective in predicting health-promoting behaviors and has a direct impact on health behaviors. Increasing the MHL increases the ability to predict HPB. Increasing educational level, income, and MHL scores can increase HPB. Several strategies could be applied to manage MS disease and increase HPB. The first would be improving the health literacy and social networks of those with MS regarding the meaning of multiple sclerosis and self-care behaviors. The second would be to improve the skills and abilities of healthcare providers in counseling and dealing with bad news for affected patients. In addition, primary care will be strengthened and the costs of treatment will be covered by health insurance.The paucity of research on MHL in people living with MS and its importance in HPBs suggests that more work is needed in this area. Therefore, a wider range of disorders needs to be investigated. In future studies, a longitudinal cohort method with potential confounders can be used to clarify whether the relationship is causal.

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Availability of data and materials: The data sets used and/or analyzed during the current study was available from the corresponding author on reasonable request.

Conflict of interest: The authors declare that they have no competing interests.

Consent for publication: Not applicable.

Ethical approval and consent to participate: This study was conducted in accordance with the Declaration of Helsinki and conducted by the Research Ethics Committee of Mashhad University of Medical Sciences (ID: IR.MUMS.REC.1401.251, 2022.10.29). First, the aims of the study were explained to the participants, and their written informed consent was obtained.

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Author's contributions: Authors FP, FP, MHD and HT designed the study. FP, HT and MHD participated in the conception of the study. FP and FP managed and conducted the statistical analyses and interpreted the data.

All authors have read and approved the final manuscript.

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