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Self-management in patients with metabolic dysfunction-associated steatotic liver disease: influencing factors and impact on readmission

Xiuli Lin², Shaorui Bao¹, Yueting Yu¹, Haiping Huang¹ and Meichun Shu^{1*}

Abstract

Background Metabolic dysfunction-associated steatotic liver disease (MASLD) is a common chronic liver disease.

Objective This study aimed to investigate the self-management ability of patients with MASLD, analyse related factors that may affect self-management ability and evaluate the impact of this ability on readmission.

Methods The study recruited patients with MASLD admitted to the Department of Infectious Diseases, First Affiliated Hospital of Wenzhou Medical University, between February and October 2021 using the random sampling method. The MASLD diagnosis was based on the guidelines for the prevention and treatment of MASLD. An analysis of patients' self-management ability was conducted using the self-management ability scale for patients with MASLD. Multiple linear regression analysis was used to analyse the factors influencing this self-management ability, and the readmission rate within 1 year was tracked. The patients were rediagnosed as having MASLD upon readmission to the hospital.

Results A total of 241 baseline data items and self-management scale scores for patients with MASLD were collected and investigated. In our study, the normal score range for the self-management scale was 31–155 points, and the self-management scale scores for patients with MASLD was 91.24 ± 16.98 , with a low level of self-management accounting for 52.7% and a medium level accounting for 44.8%. The results of the multiple linear regression analysis revealed that marital status, smoking history, fatty liver severity and education were the main factors affecting self-management ability ($P < 0.05$). The readmission rates were 18.25%, 7.48% and 0%, respectively, after 1 year of follow-up; the difference in survival distribution was statistically significant ($P < 0.05$).

Conclusion The self-management ability of patients with MASLD is relatively low and is primarily influenced by factors such as marital status, smoking history, the severity of fatty liver disease and level of education, which also affect the readmission rate of patients within 1 year.

Keywords Metabolic dysfunction-associated steatotic liver disease, Self-management, Influencing factors, Readmission

*Correspondence:

Meichun Shu
shumeichun@126.com

¹Department of Neurology, The First Affiliated Hospital of Wenzhou Medical University, No.2 Fuxue Lane, Lucheng District, Wenzhou City, Zhejiang Province 325000, China

²Department of Infectious Medicine, The First Affiliated Hospital of Wenzhou Medical University, Wenzhou City, China



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Introduction

In 2023, the new terminology of metabolic dysfunction-associated steatotic liver disease (MASLD) was introduced to replace non-alcoholic fatty liver disease (NAFLD) by a multi-society Delphi consensus statement. NAFLD is a common chronic liver disease strongly associated with genetic, environmental and metabolic stress and characterised by hepatic parenchymal cell steatosis and fat storage in patients without a history of excessive alcohol consumption [1]. Following in-depth investigation, NAFLD is considered a complex metabolic disease, with complex and multifactorial mechanisms underlying its occurrence and progression [2]. MASLD is characterized by hepatic steatosis in conjunction with the presence of at least one of five cardiometabolic risk factors. These risk factors include obesity, type 2 diabetes, hypertension, dyslipidemia, and metabolic syndrome [3]. In Asia, 99% of patients with NAFLD meet the criteria for MASLD. Nakano et al. noted that, currently, at least 98.4% of patients in NAFLD databases qualify as having MASLD in Europe [4]. Compared with the NAFLD criteria, the new MASLD definition is better suited to identifying patients with high-risk fatty liver with fibrosis. The MASLD criteria are considered to better identify patients with fatty liver at high risk of developing liver fibrosis compared with the traditional NAFLD criteria. Metabolic dysfunction-associated fatty liver disease is closely linked with a range of metabolic disorders, including obesity, atherosclerotic cardiovascular disease and dyslipidaemia. These metabolic factors contribute substantially to the overall pathogenesis and progression of MASLD [5].

The pathogenesis of MASLD is complex and multifactorial, involving the integrated effects of genetics, metabolism, gut microbiota and lifestyle factors. Insulin resistance, oxidative stress, inflammation and lipid metabolism dysfunction are believed to play crucial roles in its progression [6, 7]. Multiple stages of liver disease have been proposed to explain the pathogenesis of MASLD. Adopting a healthy lifestyle can reduce the risk of MASLD considerably, supporting the critical role of patient self-management in MASLD treatment [8]. Research has shown that diet and exercise serve as management strategies for MASLD. Weight loss, even a moderate amount, has been demonstrated to improve liver function and reduce hepatic fat content [9]. Studies indicate that a diet low in saturated fats and sugars and high in fibre, fruits and vegetables can improve liver enzymes and decrease hepatic fat content [10]. Additionally, aerobic exercise aids in the conversion of fats and carbohydrates into usable energy in the form of ATP. Some studies suggest that both aerobic and resistance exercises can reduce hepatic steatosis in patients with MASLD [11]. Lifestyle improvements are paramount for the management of this condition.

Self-management ability is defined as the individual's ability to manage the symptoms, treatment, physiological and psychosocial consequences, and lifestyle changes inherent in living with a chronic condition [12]. Therefore, this study aimed to investigate the current status of self-management ability in patients with MASLD and analyse its influencing factors to provide a theoretical reference for more scientific and effective clinical nursing interventions in the future.

Participants and methods

Participants

This study enrolled patients with MASLD who were admitted to the Department of Infectious Diseases at the First Affiliated Hospital of Wenzhou Medical University between February and October 2021 through random sampling. Patients were selected based on criteria outlined in published literatures [5, 13]; detailed screening information can be found in the supplementary material.

Sample size calculation

The sample size was estimated based on multiple linear regression analysis; the sample should be 5–10 times the variables [14]. With 12 variables included in this study, the final sample size was determined to be 64–127 patients, considering a 15% dropout rate.

Survey tools

General information questionnaire

A general information questionnaire was designed that included the patients' gender, age, marital status, education level, per capita family income, residential status, medical payment status, work status, smoking history, degree of fatty liver, family history of MASLD and number of concurrent chronic diseases. We set up the questionnaire as shown in Table S1.

Self-management scale

The self-management scale for patients with MASLD, developed by Xu Qian [15], has a Cronbach's α coefficient of 0.899, indicating a high level of internal consistency within the scale and a strong correlation between its items. This scale includes five dimensions to reveal patients' self-management ability in relation to a specific item: disease prevention and treatment (11 items), daily life (10 items), disease knowledge (4 items), psychological cognition (3 items) and unhealthy lifestyle (3 items); it has a total of 31 items. By adopting a 5-point Likert scale, this scale score ranged from 31 to 155 points. Patients with higher scores have a higher level of self-management ability. The scale score analysis used the formula for index scoring [12]: index scoring = (actual score of the scale/possible highest score of the scale) \times 100%. According to the calculation, the self-management score

was divided into three levels: low (<60%), medium (60–80%) and high (>80%). Patients with higher scores have a higher level of self-management ability.

Patient 1-year readmission data

After discharge, patients were followed up every 4 weeks by telephone, WeChat and outpatient visits for 1 year. The follow-up ended after the occurrence of endpoint events. The first endpoint event was readmission of patients because of liver dysfunction indicated by alanine aminotransferase ≥ 100 U/L or the identification of cirrhosis using a liver hardness test; the second endpoint event was death. We employed ultrasound elastography to measure liver hardness [16].

Data collection

- 1) General information questionnaire: Baseline data of the enrolled patients were obtained by accessing the patients' medical record homepage and through patient inquiry.
- 2) Self-management scale: The self-management scale was measured by a research group formed of ward staff, with one nurse, two caregivers and two supervising caregivers. Approximately 1 month after discharge, patients were followed up in the Outpatient Department, and a scale evaluation was conducted in the nearest consultation room. Patients were instructed on how to complete the scale questionnaire and the precautions to be taken by researchers first. If patients were unable to complete the questionnaire, the researchers carefully helped them to complete it accurately. Researchers were responsible for verifying and collecting the questionnaire in person after its completion.
- 3) Follow-up: After discharge, patients were followed up for a period of 1 year by telephone, WeChat and outpatient services to establish whether the patients had been readmitted as a result of liver dysfunction or had died. Patients were lost to follow-up if the patients could not be contacted after five telephone calls within 2 days.

Quality control

Before the questionnaires were completed, researchers provided a comprehensive explanation on the completion requirements to prevent bias. If the patient had any questions while completing the questionnaire, the researchers responded immediately to ensure the completeness of data collection. Simultaneously, contact between doctors and patients was maintained. Researchers and patients with MASLD were contacted by telephone, WeChat and through other means, with the contact information of the

patient's family members also retained to reduce the lost-to-follow-up rate. Two researchers were responsible for data entry, and the original questionnaire was examined for inconsistencies. If necessary, guidance from statistical experts was sought to ensure the scientificity of the data analysis and reliability of the results.

Statistical analysis

Excel software was used for data management, and the SPSS 22.0 (IBM, Armonk, NY, USA) was employed for statistical processing. Counting data, such as some patient baseline data and scale scores, were expressed as frequency and percentage. The Kolmogorov–Smirnov test was used to test the normality of measurement data, and data with normal distribution were expressed as mean \pm standard deviation or median interquartile range. The differences in general data such as gender, age and marital status were analysed using independent sample t-tests and one-way ANOVA. Multivariate analysis was performed using multiple linear regression analysis. A Kaplan–Meier analysis was performed to plot the survival curves to evaluate the impact on patient readmission. If patients had no endpoint events because of loss to follow-up, the sample was deleted when plotting the survival curve. The inspection level was $\alpha=0.05$.

Results

Baseline data and related characteristics of the self-management scores for patients with MASLD

This study enrolled 255 patients with MASLD who met the inclusion and exclusion criteria, with 255 questionnaires distributed and 241 valid questionnaires finally collected, which constituted an effective response rate of 94.5%. There were 132 men and 109 women, with the majority (79.6%) aged 31–60 years. The majority (83.0%) were married, 145 (60.2%) had no smoking history, 159 (66.0%) had mild fatty liver, 190 (78.8%) had ≥ 1 type(s) of chronic diseases and 51.9% had a family history of MASLD. Table 1 summarises the baseline data of the enrolled patients.

Self-management scores of patients with MASLD

The average self-management score of the 241 patients was 91.24 ± 16.98 points, ranging from 60 to 130 points. The total scores for unhealthy lifestyle, psychological cognition management, disease prevention and treatment management, disease knowledge management, and daily life management were 15, 15, 55, 20 and 50 points, respectively, and the average patient scores were 10.45 ± 3.28 , 9.69 ± 2.00 , 32.42 ± 8.38 , 11.44 ± 3.58 and 27.23 ± 6.23 , respectively, with a scoring rate of 69.67%, 64.60%, 58.95%, 57.20% and 54.46%, respectively. The specific scores for each dimension are presented in Table 2. The level of self-management ability was low

Table 1 Baseline data and univariate analysis of self-management scores in MASLD patients ($n = 241$)

Items	Feature	HR(95%CI)	P
sex	Male	Reference	0.726
	Female	1.134(0.561~2.295)	0.726
age		1.010(0.978~1.044)	0.543
Marital status	Unmarried	Reference	
	Married	0.609(0.249~1.490)	0.277
	divorced or widowed	0.484(0.058~4.018)	0.501
Education degree			0.244
	Illiteracy	Reference	
	Primary school	0.324(0.081~1.297)	0.111
	Middle school	0.224(0.062~0.804)	0.022
Per capita family income	College degree or above	0.326(0.091~1.171)	0.086
			0.617
	< 1000	Reference	
	1000~3000	0.848(0.212~3.392)	0.816
Medical payment mode	3001~5000	1.334(0.386~4.607)	0.649
	> 5000	1.682(0.435~6.506)	0.451
			0.978
	Self-funded	Reference	
Working condition	Social medical insurance	1.146(0.323~4.061)	0.833
	New rural cooperative medical insurance	1.226(0.352~4.268)	0.748
	Commercial health insurance	0.946(0.158~5.659)	0.591
			0.275
inhabiting information	Full-time	Reference	
	Part-time work	0.872(0.338~2.247)	0.777
	Non-employed	1.809(0.813~4.028)	0.146
Smoking history			0.071
	Living alone	Reference	
	Residence of couples	69834.523(0~5.88E1400)	0.944
MASLD degree	others	53762.688(0~4.54E140)	0.946
	Yes	Reference	0.15
	No	1.678(0.830~3.394)	0.15
Number of chronic diseases			0.51
	Low-grade	Reference	
	Mild-grade	0.718(0.290~1.778)	0.473
MASLD	serve	1.533(0.526~4.466)	0.474
			< 0.001
	0	Reference	
	1	2.658(0.297~23.777)	0.382
self-management abilities	2	12.165(1.607~92.102)	0.016
	3 or more	13.447(1.736~104.172)	0.013
			0.115
	Yes	Reference	
self-management abilities	No	0.853(0.383~1.899)	0.697
	Unclear	2.640(1.024~6.807)	0.045
			0.021
self-management abilities	Low grade	Reference参考	
	Medium grade	0.286(0.173~0.863)	0.020
	High grade	0(-)	0.979

Table 2 Self-management scores of MASLD patients

Items	Score range	Actual score	Index scoring%	Ranking
Total score for un-healthy lifestyle	3–15	10.45 ± 3.28	69.67	1
Total score for psychological cognitive management	3–15	9.69 ± 2.00	64.6	2
Total score for disease prevention and control management	11–55	32.42 ± 8.38	58.95	3
Total score for disease knowledge management	4–20	11.44 ± 3.58	57.2	4
Total score for daily life management	10–50	27.23 ± 6.23	54.46	5
Total score	31–155	91.24 ± 16.98	—	—

(<60%) for 127 patients, medium (60–80%) for 108 patients and high (>80%) for 6 patients, accounting for 52.7%, 44.8% and 2.5%, respectively.

Univariate analysis of the self-management ability of patients with MASLD

The result of univariate analysis showed patients over 50 years as well as those who were married, had a college degree or above, had commercial health insurance, had no smoking history, had severe fatty liver and had no concomitant chronic diseases had higher self-management scores than other age groups.

Factors associated with higher levels of self-management ability

The results of univariate analysis identified statistically significant differences ($P < 0.05$) in self-management scores among the patients with MASLD when these factors, including age, marital status, education level, medical payment method, smoking history, severity of fatty liver and number of comorbid chronic diseases (see Table 1), were considered as variables. When age was considered as a single factor, there were significant differences in scores across different age groups. Within the age range of 20–60 years, self-management scores tended to increase with age. The lowest self-management score was observed in the 20–30-years age group, with a mean of 83.84 ± 11.15 , whereas the highest self-management score among the patients with MASLD was in the 51–60 age group, with a mean of 94.86 ± 18.39 .

Married patients with MASLD demonstrated significantly higher levels of self-management ability than unmarried patients. When education level was considered as a single factor, self-management scores increased with higher levels of education (illiteracy, primary school, middle school and college degree or above). Notably, when household income was considered as a single factor, the lowest self-management scores were

Table 3 Variable assignment

Variables	Assignment
Age	Specific value assignment
Marital status	Unmarried, divorced or widowed = 0; Married = 1
Education degree	Illiteracy = 1; Primary school = 2; Middle school = 3; College degree or above = 4
Medical payment mode	Self-funded = 1; Social medical insurance = 2; New rural cooperative medical insurance = 3; Commercial health insurance = 4
Smoking history	Without smoking history = 0; With smoking history = 1
Degree of fatty liver	Mild = 1; medium = 2; Severe = 3
Number of concurrent chronic diseases	0 type = 1; 1 type = 2; 2 types = 3; ≥ 3 types = 4

Table 4 Multiple linear regression analysis of self-management ability in MASLD patients

Variables	Regression coefficient	Standard error	Standard regression coefficient	t value	P value
Intercept	53.481	7.311		7.315	< 0.001
Age	-0.038	0.094	-0.024	-0.401	0.689
Marital status	14.853	2.638	0.329	5.632	< 0.001
Education degree	2.458	1.147	0.115	2.144	0.033
Medical payment mode	1.152	1.104	0.054	1.044	0.298
Smoking history	-12.085	1.925	-0.349	-6.279	< 0.001
Degree of fatty liver	4.313	1.429	0.165	3.018	0.003
Number of concurrent chronic diseases	0.170	0.869	0.010	0.196	0.845

not observed in the lowest income bracket (<1,000) but rather in the 1,000–3,000 income bracket. Non-smoking patients had significantly higher self-management scores than patients who smoked. When considering the severity of fatty liver or the number of comorbidities as single factors, self-management scores gradually decreased with the worsening severity of fatty liver or increased of number of concurrent chronic diseases.

Multivariate analysis of the self-management ability of patients with MASLD

Multiple linear regression analysis was performed using patients’ self-management score as the dependent variable and variables with statistically significant differences (see Table 1) as the independent variables. The assignment of independent variables is presented in Table 3, and the results of the multivariate analysis are summarised in Table 4. Four variables (marital status, education level, smoking history and severity of fatty liver) with statistical significance were included in the model

for analysis, effectively explaining a 53.48% variability in the total self-management score of patients with MASLD ($F=21.549$, $P<0.001$). This study further clarified the degree to which each independent variable affected the patient's self-management ability. Generally, the dependent variable with the larger absolute slope value had a greater impact on the dependent variable. Therefore, the factor with the greatest influence on the self-management ability of patients with MASLD was marital status (slope, 14.853), followed by smoking history (slope, -12.085) and severity of fatty liver (slope, 4.313), with education level (slope, 2.458) having the least impact.

Comparison of survival curves among three groups of patients

During the 1-year follow-up, among the 127 patients with low self-management ability, no loss to follow-up occurred, 23 patients were readmitted and 1 patient died of an unknown cause. Among the 108 patients with medium self-management ability, one patient was lost to follow-up and eight were readmitted. There were six patients with high self-management ability, with no loss to follow-up, no death and no readmission. The readmission rate for the low, medium and high self-management ability groups was 18.25% (excluding deaths), 7.48% (excluding deaths) and 0%, respectively. Using Kaplan–Meier to plot survival curves, the distribution of 'survival' among the three groups of patients was analysed using the log-rank test, with a statistically significant difference identified ($\chi^2=6.824$, $P=0.033$). The survival curve of patients with low self-management ability was worse

than that of the medium and high self-management ability groups (Fig. 1).

Univariate and multivariate Cox analysis of readmission in patients with MASLD

We conducted univariate Cox regression analysis on 12 factors affecting the readmission of patients with MASLD. The results indicated that the number of chronic diseases and self-management ability significantly influenced patient readmission (Table 5). These two variables were then included in a multivariate Cox regression using a stepwise approach. As shown in Table 6, having two or more chronic diseases had a more significant impact on readmission rates for MASLD. Additionally, an intermediate level of self-management ability had a more significant impact on readmission rates compared to a higher level.

Discussion

Analysis of the self-management ability of patients with MASLD

Emerging as a common public health problem, MASLD is exhibiting a considerable increase in incidence with the continuous change in lifestyle and dietary habits [17]. Currently, both domestic and foreign scholars recognise that MASLD is reversible and can be prevented by lifestyle and behaviour modifications, especially by adjusting dietary habits and exercise routines [18, 19]. According to existing guidelines, changing unhealthy lifestyles is key to treating MASLD [20, 21]. In addition to the involvement of professional healthcare personnel, MASLD

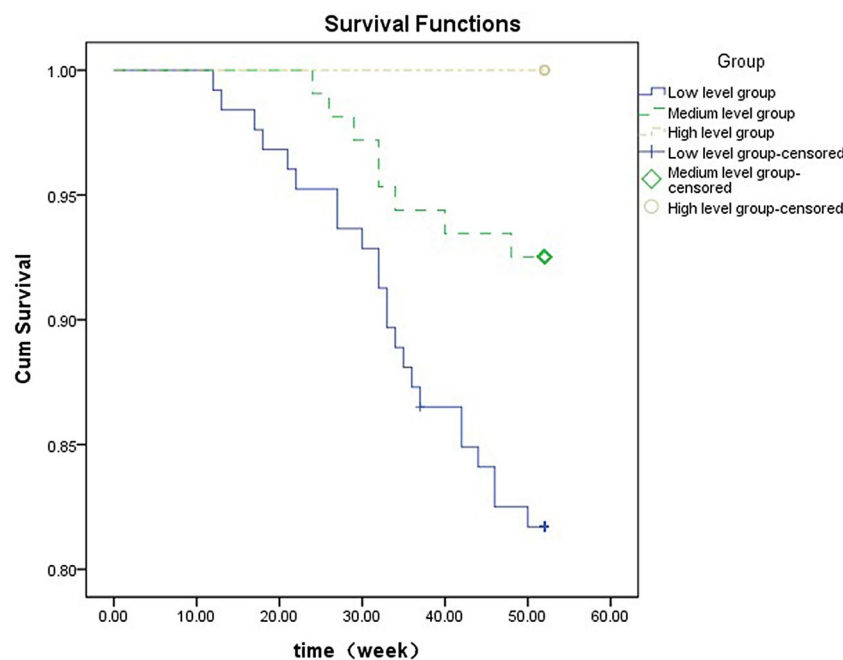


Fig. 1 Kaplan-Meier survival curves for three groups of MASLD patients

Table 5 MASLD patients' readmission Cox regression univariate analysis results

items	feature	HR (95%CI)	p
sex		Reference	0.726
	male	1.134(0.561~2.295)	0.726
age	female	1.010(0.978~1.044)	0.543
Marital status		Reference	0.557
	Unmarried	0.609(0.249~1.490)	0.277
	Married	0.484(0.058~4.018)	0.501
Education degree	divorced or widowed		0.244
	Illiteracy	0.324(0.081~1.297)	0.111
	Primary school	0.224(0.062~0.804)	0.022
	Middle school	0.326(0.091~1.171)	0.086
Per capita family income	College degree or above		0.617
	< 1000	0.848(0.212~3.392)	0.816
	1000~3000	1.334(0.386~4.607)	0.649
	3001~5000	1.682(0.435~6.506)	0.451
Medical payment mode	> 5000		0.978
	Self-funded	1.146(0.323~4.061)	0.833
	Social medical insurance	1.226(0.352~4.268)	0.748
	New rural cooperative medical insurance	0.946(0.158~5.659)	0.591
Working condition	Commercial health insurance		0.275
	Full-time	0.872(0.338~2.247)	0.777
	Part-time work	1.809(0.813~4.028)	0.146
inhabiting information	Non-employed		0.071
	Living alone	69834.523(0~5.88E1400)	0.944
	Residence of couples	53762.688(0~4.54E140)	0.946
Smoking history	others		0.150
	Yes	1.678(0.830~3.394)	0.150
	No		0.510
MASLD degree		Reference	
	Low-grade	0.718(0.290~1.778)	0.473
	Mild-grade	1.533(0.526~4.466)	0.474
Number of chronic diseases	serve		< 0.001
	0	2.658(0.297~23.777)	0.382
	1	12.165(1.607~92.102)	0.016
	2	13.447(1.736~104.172)	0.013
	3 or more		0.115
MASLD		Reference	
	Yes	0.853(0.383~1.899)	0.697
	No	2.640(1.024~6.807)	0.045
self-management abilities	Unclear		0.021
	Low grade	0.286(0.173~0.863)	0.020
	Medium grade	0(-)	0.979
	High grade		

Table 6 MASLD with COX regression multi-factor analysis result of readmission

Variant	feature	HR	95%CI	P value
Number of chronic diseases (with 0 as reference)	1	2.143	0.293~19.203	0.496
	2	14.805	1.948~112.519	0.009
	3 and more	13.051	1.684~101.130	0.014
self-management abilities (Low level as reference)	Medium grade	0.272	0.119~0.621	0.002
	High grade	0.001	—	0.979

management relies on patients' self-management. In this survey, the self-management ability score of patients with MASLD was 91.24 ± 16.98 points, with the highest score (>80%) being 130 and the lowest (<60%) 60. The frequency of behaviour was between 'sometimes' and 'often', indicating a medium-to-low level of self-management ability and therefore a poor understanding of MASLD among the patients [22]. This result suggests that medical staff should pay attention to these patients, evaluate their self-management ability promptly, take effective nursing measures and assist patients in improving their self-management ability to benefit their long-term prognosis [23]. According to the ranking of the average scores in each dimension of the scale, the highest index score related to unhealthy lifestyle, suggesting that patients have the strongest desire to establish a healthy lifestyle and can cooperate with medical staff in the most proactive manner to promote their own recovery. However, daily life management had the lowest score, indicating that the details of daily life are easily ignored over a long period, which should be focused on if improvement goals are to be achieved.

Analysis of the factors influencing the self-management ability of patients with MASLD

Marital status

Multivariate analysis revealed that marital status had the greatest impact on self-management ability in patients with MASLD (slope, 14.853). This might be because the spouses, the patients' major life partners, not only provide care in daily life but also supervise and help establish a healthy lifestyle in terms of disease care, especially for chronic diseases. A lack of effective support from family members is currently one of the obstacles to the effective self-management of chronic diseases [15]. Thus, the care and supervision given by spouses to patients after illness are key to recovery, and patients may benefit significantly from the active roles of spouses involved in disease

management supported by medical staff through interviews and communication.

Smoking history

Multivariate analysis also revealed that smoking history had a significant impact on the self-management ability of patients with MASLD (slope, -12.085). Patients with a smoking history had poorer self-management ability than those without a smoking history ($P < 0.001$), and those who also had unhealthy lifestyles had significantly lower scores. A study reported that heavy smokers might have a significantly higher probability of developing MASLD than non-smokers [24], highlighting the importance of active smoking cessation in these patients. In particular, medical staff should emphasise and strengthen smoking cessation in health education for patients with MASLD and provide guidance [25].

Severity of fatty liver

As indicated by multivariate analysis, the severity of fatty liver had a certain impact on the self-management ability of patients with MASLD (slope, 4.313). The self-management ability of these patients improved as the severity of fatty liver increased. Patients can easily ignore the symptoms of mild MASLD and may lack awareness of the disease. As the disease worsens, patients have to adopt further intervention measures and strengthen and improve their self-management ability to delay or inhibit disease progression. Therefore, health education by medical staff for patients with mild MASLD must also be strengthened to improve lifestyles and enhance self-management ability [26].

Education level

Multivariate analysis indicated that education level had a relatively small impact on the self-management ability of patients with MASLD (slope, 2.458). Patients with higher education levels had higher scores in self-management ability. Patients with different education levels appear to have different cognition and perceptions as well as different abilities to adopt new practices. Patients with higher education levels have a relatively strong ability to adopt new practices, quickly accept new information, adopt a healthy lifestyle and, eventually, improve their self-management ability. Therefore, in clinical practice, medical staff should implement individualised health education and guidance plans based on patients' education level to improve patients' self-management ability and facilitate their adoption of a healthy lifestyle.

Effect of the self-management ability level of patients with MASLD on their 1-year readmission rate

In this study, statistical differences were observed in the survival distribution of 1-year readmission among

patients with different self-management abilities ($P < 0.05$). The 1-year readmission rate was 18.25% and 7.48% in groups with low (<60%) and medium (60–80%) self-management abilities, respectively. Self-management ability plays a key role in the prognosis of patients with MASLD. A high level of self-management ability can promote a healthy lifestyle, improve patients' treatment compliance, enhance liver function and, ultimately, reduce the readmission rate. Patients with higher levels of self-management ability may actively cope with the disease and maintain positive lifestyle habits for a long time. These patients are also able to effectively manage disease prevention and control, their daily lives and disease knowledge management in the future, enabling them to benefit from the effective implementation of secondary prevention, which contributes to the reduced risk of readmission. Improving patients' self-management ability is a long-term sustainable strategy, which can involve out-of-hospital internet-based nursing to assist patients in improving their self-management ability and prevent recurrence-related readmission. Low self-management abilities should not lead to the stigmatization of patients. It is crucial to emphasize that low self-management abilities are not a personal failure but are influenced by various factors, and appropriate support should be provided to improve these abilities without inducing stigma.

However, this study has some limitations. First, because of the limited time and effort, this study included samples from only one hospital, resulting in a limited sample size. Second, patient completion of the self-management scale questionnaires in this study might be influenced by subjective factors to some extent. Moreover, retrospective analysis can only analyse the factors influencing patient self-management ability; causal relationships cannot be determined. Therefore, based on the current research, future research using expanded experimental methods and a larger sample size can be conducted to provide stronger evidence for the improvement of self-management ability and reduced risk of readmission among patients with MASLD.

Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s41043-024-00618-z>.

Supplementary Material 1

Supplementary Material 2

Acknowledgements

None.

Author contributions

Shu MC conceived of the study, and Lin XL, Bao SR, Yu YT and Huang HP participated in its design and data analysis and statistics and Shu MC helped to draft the manuscript. All authors read and approved the final manuscript.

Funding

This study did not receive any funding in any form.

Data availability

All data generated or analysed during this study are included in this article. Further enquiries can be directed to the corresponding author.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Declaration of Helsinki and approved by the ethics committee of The First Affiliated Hospital of Wenzhou Medical University. Written informed consent was obtained from all participants.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Received: 18 January 2024 / Accepted: 11 August 2024

Published online: 31 August 2024

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