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Original Article

Profiles of Medication Literacy and its Predictors among Young and Middle-Aged Hypertensive Patients in China: A Latent Profile Analysis

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Abstract:

Improving the medication literacy among individuals with hypertension has emerged as a significant public health issue. However, the heterogeneity of medication literacy and its predictors among patients with hypertension, especially among the young and middle-aged people, has yet to be explored.

The current study aimed to identify the characteristic profiles of medication literacy among young and middle-aged hypertensive patients and investigate the associated influencing factors to guide targeted clinical interventions.

A cross-sectional study was conducted with 544 consecutively recruited young and middle-aged patients with hypertension from two tertiary hospitals in China between July and November 2024. Researchers administered five validated instruments including the Demographic and Disease-Related Characteristics Questionnaire, the Revised Chinese Medication Literacy Scale for Hypertensive Patients (C-MLSHP-R), the Perceived Social Support Scale (PSSS), the General Self-Efficacy Scale (GSES), and the Brief Illness Perception Questionnaire (BIPQ). Latent profile analysis (LPA) was performed using Mplus 8.3 software, followed by hierarchical logistic regression modeling using SPSS Statistics 26.0.

The latent profile analysis revealed three distinct profiles of medication literacy among young and middle-aged hypertensive patients: low medication literacy (35.3%), moderate medication literacy (50.2%), and high medication literacy (14.5%). Furthermore, multivariate logistic regression demonstrated that education level, per capita monthly family income, social support, self-efficacy, and disease perception were significant factors affecting medication literacy among young and middle-aged patients with hypertension (all $p < 0.05$).

In the light of the specific medication literacy characteristics, healthcare professionals should implement targeted interventions that merit clinical adoption and broader implementation.

Keywords: Medication literacy, Young and middle-aged hypertensive patients, Latent profile analysis, Influencing factors

1. Introduction

Currently, China is grappling with the escalating burden of hypertension. A recent study indicated a substantial rise in the number of adults aged 30-79 with hypertension, and more of the increase living in low- and middle-income countries [1]. Despite this growing prevalence, the awareness, treatment and control rates for hypertension remain relatively low in China [2]. Notably, young and

middle-aged people demonstrate particular vulnerability due to three critical factors: heightened health risk perception deficits compared to older adults, inadequate self-management behaviors, and persistent misconceptions equating asymptomatic presentation with therapeutic non-necessity [3,4]. Therefore, effective management of hypertension among young and middle-aged people is essential to prevent deterioration and complications, making it a key public health priority.

Medication literacy is an individual's ability to acquire, understand, communicate, compute, and process drug-specific information in order to make informed medication and health decisions that ensure safe and effective medication use [5]. Evidence substantiated its positive correlation with medication adherence and blood pressure control in hypertensive populations [6-8]. In recent years, most studies on medication literacy employed a "variable-centered" approach, assuming sample homogeneity and focusing on group characteristics [9]. However, this approach overlooks individual differences and group heterogeneity.

Latent profile analysis (LPA), a "person-centered" method, identifies group heterogeneity by analyzing shared response patterns and classifying individuals into distinct subgroups [10,11]. This approach improves classification accuracy and captures subgroup characteristics, which is useful for guiding individualized clinical practice and achieving improved intervention outcomes, particularly for vulnerable groups [12]. Unfortunately, the heterogeneity of medication literacy among hypertensive patients, especially among the young and middle-aged people has yet to be explored. Therefore, this study used the LPA to explore the latent profile characteristics of medication literacy among young and middle-aged patients with hypertension. We further analyzed the influencing factors of each subgroup and the potential categories of medication literacy to provide evidence for developing targeted intervention strategies.

2. Methods

2.1 Participants

This multicenter cross-sectional study enrolled 544 consecutively sampled hypertensive adults (aged 18-59 years) from two tertiary hospitals in China between July and November 2024. This study was reviewed and approved by the Ethics Committee of Huzhou University (No. 202240703, dated January 10, 2025). The inclusion criteria were as follows: (1) age 18-59 years, (2) confirmed hypertension diagnosis per 2024 Chinese Hypertension Management Guidelines [13], (3) current or recent (≤3 months) antihypertensive medication use, (4) intact cognitive/communication capacity, and (5) written informed consent. Exclusion criteria included: (1) psychiatric comorbidities or severe hypertensive complications (e.g., encephalopathy, crisis), (2) major systemic disorders (malignancy, recent cardiovascular/cerebrovascular events, end-stage renal disease), (3) secondary hypertension etiologies, and (4) participation in other hypertension trials within 30 days prior to the study.

2.2 Research Tools and Data Collection

The study incorporated five validated instruments: (1) the Demographic and Disease-Related Characteristics survey, (2) the Revised Chinese Medication Literacy Scale for Hypertensive Patients (C-MLSHP-R), (3) the Perceived Social Support Scale (PSSS), (4) the General Self-Efficacy Scale (GSES), and (5) the Brief Illness Perception Questionnaire (BIPQ). The C-MLSHP-R (18 items) operationalize medication literacy through four essential domains: medication knowledge, medication attitude, medication skills, and medication behaviors [14]. The PSSS questionnaire is a 12-item self-report inventory divided into the following three domains: family support, friend support, and other support [10]. The GSES questionnaire consist of 10 items measured on a 4-point Likert scale ranging from 1 ("completely disagree") to 4 ("completely agree") [15]. The BIPQ questionnaire include three dimensions: disease cognition, emotion and disease understanding [16]. The scale range from 0 to 80 points. Higher scores indicated more negative disease perceptions and emotions.

The participants were first informed about the confidentiality and content of the study. After providing their informed consent, participants voluntarily completed the questionnaires. Questionnaires were administered and returned on-site by five uniformly trained respondents. For a small number of illiterate patients, the

researchers read the content of the questionnaire aloud and completed it according to the patient's wishes. The sample size for this study was in accordance with the recommended sample size for potential cross-sectional analysis, specifically n>500 [17].

2.3 Data Analysis

Data were analyzed using SPSS 26.0 and Mplus 8.3 software. Measurement data were described as means and standard deviations, while count data were described using frequencies and composition ratios. The Chi-square test and variance analysis were used to screen for statistically significant indicators. Logistic regression analysis was used to evaluate key factors affecting medication literacy. Latent profile modeling began with a baseline model (one category), gradually increasing the number of categories and testing the model fit indices for each. The fit indicator criteria include: (1) Akaike Information Criterion (AIC), Bayesian Information Criterion (BIC), and adjusted BIC (aBIC), where lower values indicate better fit. (2) entropy, where values closer to 1 indicate better classification accuracy. (3) Lo-Mendell-Rubin Adjusted Likelihood Ratio Test (LMR) and Bootstrap Likelihood Ratio Test (BLRT), with $p<0.05$, indicating that a K-class model is better than a K-1 class model. All tests were performed using a two-sided approach with a significance level of 0.05.

3. Results

3.1 Demographic Characteristics

Of the 573 questionnaires distributed, 29 were excluded as invalid, leaving 544 valid responses with a response rate of 94.94%. Table 1 showed the general characteristics of the 544 young and middle-aged patients with hypertension.

Table 1 Demographic and disease characteristics of each latent profile (n=544)

		P1: low	P2: medium	P3: high		
		medication	medication	medication		
		literacy	literacy	literacy		
Variables	Overall (n=544)	(n=192)	(n=273)	(n=79)	X^2/F	*P* value
Gender						
Male	330 (60.7%)	115 (59.9%)	162 (59.3%)	53 (67.1%)	1.614	0.446
Femal	214 (39.3%)	77 (40.1%)	111 (40.7%)	26 (32.9%)		
Age (year)						
18-40	140 (25.7%)	31 (16.1%)	84 (30.8%)	25 (31.6%)	28.011	< 0.001
41-50	218 (40.1%)	73 (38.0%)	105 (38.5%)	40 (50.6%)		
51-59	186 (34.2%)	88 (45.8%)	84 (30.8%)	14 (17.7%)		
Education						
Junior middle school and below	324 (59.6%)	160 (83.3%)	149 (54.6%)	15 (19.0%)	103.077	< 0.001
Senior school or technical secondary school	104 (19.1%)	19 (9.9%)	56 (20.5%)	29 36.7%)		
Junior college/ College degree or above	116 (21.3%)	13 (6.8%)	68 (24.9%)	35 (44.3%)		
Residence						
Urban	378 (69.5%)	110 (57.3%)	203 (74.4%)	65 (82.3%)	22.620	< 0.001
Rural areas	166 (30.5%)	82 (42.7%)	70 (25.6%)	14 (17.7%)		
Occupation status						
On-the-job	394 (72.4%)	116	214	64 (81.0%)	21.848	<

		(60.4%)	(78.4%)			0.001
Jobless	93 (17.1%)	46 (24.0%)	37 (13.6%)	10 (12.7%)		
Retired	57 (10.5%)	30 (15.6%)	22 (8.1%)	5 (6.3%)		
Work type						
mainly manual labor	269 (49.4%)	109 (56.8%)	129 (47.3%)	31 (39.2%)	19.123	0.001
mainly mental labor	236 (43.4%)	63 (32.8%)	127 (46.5%)	46 (58.2%)		
neither	39 (7.2%)	20 (10.4%)	17 (6.2%)	2 (2.5%)		
Marital status						
Married	461 (84.7%)	168 (87.5%)	229 (83.9%)	64 (81.0%)	7.804	0.137*
Unmarried	62 (11.4%)	14 (7.3%)	37 (13.6%)	11 (13.9%)		
Divorced	18 (3.3%)	9 (4.7%)	6 (2.2%)	3 (3.8%)		
widowed	3 (0.6%)	1 (0.5%)	1 (0.4%)	1 (1.3%)		
Medical insurance type						
Self-paying or other	51 (9.4%)	20 (10.4%)	27 (9.9%)	4 (5.1%)	7.927	0.244
New rural cooperative medical insurance	42 (7.7%)	21 (10.9%)	18 (6.6%)	3 (3.8%)		
Medical insurance for urban workers	402 (73.9%)	134 (69.8%)	205 (75.1%)	63 (79.7%)		
Medical insurance for urban residents	49 (9.0%)	17 (8.9%)	23 (8.4%)	9 (11.4%)		

Table 1 continued

		P1: low	P2: medium	P3: high		
		medication	medication	medication		
		literacy	literacy	literacy		
Variables	Overall (n=544)	(n=192)	(n=273)	(n=79)	X^2/F	*P* value
The number of people who live together						
1 or below	130 (23.9%)	40 (20.8%)	73 (26.7%)	17 (21.5%)	2.450	0.294
2 or above	414 (76.1%)	152 (79.2%)	200 (73.3%)	62 (78.5%)		
Per capita monthly household income (¥)**						
＜5,000	179 (32.9%)	114 (59.4%)	55 (20.1%)	10 (12.7%)	113.550	＜ 0.001
5,000-10,000	230 (42.3%)	58 (30.2%)	142 (52.0%)	30 (38.0%)		
＞10,000	135 (24.8%)	20 (10.4%)	76 (27.8%)	39 (49.4%)		
History of hypertension (year)						
＜5	260 (47.8%)	82 (42.7%)	144 (52.8%)	34 (43.0%)	7.576	0.108
5-10	181 (33.3%)	67 (34.9%)	88 (32.2%)	26 (32.9%)		
＞10	103 (18.9%)	43 (22.4%)	41 (15.0%)	19 (24.1%)		
History of						

antihypertensives (year)						
＜5	303 (55.7%)	101 (52.6%)	163 (59.7%)	39 (49.4%)	5.780	0.216
5-10	149 (27.4%)	58 (30.2%)	70 (25.6%)	21 (26.6%)		
＞10	92 (16.9%)	33 (17.2%)	40 (14.7%)	19 (24.1%)		
BP monitoring						
Yes	398 (73.2%)	100 (52.1%)	228 (83.5%)	70 (88.6%)	67.951	＜ 0.001
No	146 (26.8%)	92 (47.9%)	45 (16.5%)	9 (11.4%)		
Types of medications						
1	362 (66.5%)	126 (65.6%)	181 (66.3%)	55 (69.6%)	2.901	0.574
2	147 (27.0%)	54 (28.1%)	71 (26.0%)	22 (27.8%)		
≥3	35 (6.4%)	12 (6.3%)	21 (7.7%)	2 (2.5%)		
Family history of hypertension						
Yes	332 (61.0%)	112 (58.3%)	173 (63.4%)	47 (59.5%)	1.294	0.524
No	212 (39.0%)	80 (41.7%)	100 (36.6%)	32 (40.5%)		
Medical background						
Yes	96 (17.6%)	28 (14.6%)	56 (20.5%)	12 (15.2%)	3.111	0.211
No	448 (82.4%)	164 (85.4%)	217 (79.5%)	67 (84.8%)		
Number of comorbidities						
0	328 (60.3%)	112 (58.3%)	164 (60.1%)	52 (65.8%)	2.664	0.850
1	165 (30.3%)	64 (33.3%)	81 (29.7%)	20 (25.3%)		
2	41 (7.5%)	13 (6.8%)	23 (8.4%)	5 (6.3%)		
≥3	10 (1.8%)	3 (1.6%)	5 (1.8%)	2 (2.5%)		
Side effect of medication						
Yes	203 (37.3%)	77 (40.1%)	94 (34.4%)	32 (40.5%)	1.952	0.377
No	341 (62.7%)	115 (59.9%)	179 (65.6%)	47 (59.5%)		

Table 1 Continued

		P1: low	P2: medium	P3: high		
		medication	medication	medication		
		literacy	literacy	literacy		
Variables	Overall (n=544)	(n=192)	(n=273)	(n=79)	X^2/F	*P* value
PSSS（mean±SD）	53.95±10.73	46.03±8.01	56.77±9.39	63.51±7.88	141.15	＜ 0.001
GSES（mean±SD）	26.78±5.60	22.84±4.14	28.08±5.13	31.85±3.74	128.49	＜ 0.001
BIPQ（mean±SD）	37.28±12.53	47.54±8.21	33.60±10.78	25.06±8.02	195.01	＜ 0.001

[*]Fisher's exact probability method.
[**]US$1 equals ¥7.1793, exchange rate on 1 February 2025.
PSSS, the Perceived Social Support Scale; GSES, the General Self-Efficacy Scale; BIPQ, the Brief Illness Perception Questionnaire.

3.2 Latent Profile Analysis and Characteristics of Latent Classes

As shown in Table 2, the AIC, BIC, and aBIC values demonstrated a consistent decline with increasing category numbers, although the LMR test for Model 4 did not reach statistical significance (p>0.05). Model 2 displayed suboptimal entropy (<0.8), whereas the 5-profile model achieved higher entropy values. However, Model 5's smallest class proportion fell below the recommended threshold of 5%. Combining the results of the model comparisons and classification accuracy, the 3-profile model was the optimal potential profile model for medication literacy. The average attribution probabilities for each profile were 97.2%, 96.7%, and 97.9%, respectively, all exceeding 90%. These values indicated that the results of the 3-profile model were reliable. The characteristics of the latent classes were comprehensively detailed in Figure 1 and Table 3. Profile 1 (n=192, 35.3%), characterized by consistently low scores across all items, was designated as "low medication literacy (Low C-MLSHP-R)". Profile 2 (n=273, 50.2%) exhibited moderate performance across domains, classified as "medium medication literacy (Medium C-MLSHP-R)". Profile 3 (n=79, 14.5%) demonstrated uniformly high item scores, identified as "high medication literacy (High C-MLSHP-R)".

Table 2 Fit statistics for profile structure (n=544)

No.of profiles	AIC	BIC	aBIC	Entropy	LMR	BLRT	Latent profile proportion (%)
1	2915.486	2949.878	2924.483	—	—	—	—
2	2167.036	2222.922	2181.655	0.789	0.008	< 0.001	0.546/0.454
3	1585.879	1663.260	1606.121	0.927	< 0.001	< 0.001	0.353/0.502/0.145
4	1493.893	1592.769	1519.758	0.936	0.108	< 0.001	0.357/0.143/0.053/0.447
5	1437.835	1558.206	1469.323	0.945	< 0.001	< 0.001	0.449/0.355/0.009/0.053/0.134

aBIC, adjusted BIC; AIC, Akaike information criterion; BIC, Bayesian information criterion; BLRT, bootstrap likelihood ratio test; LMR, Lo-Mendell--Rubin likelihood ratio test.

Table 3 Mean scores and standard deviation for each dimension of the three-profile model of medication literacy (n=544)

	Profile 1	Profile 2	Profile 3
	Low medication literacy (n=192)	Moderate medication literacy (n=273)	High medication literacy (n=79)
	M (SD)	M (SD)	M (SD)
medication knowledge	1.26±0.04	1.93±0.02	2.88±0.03
medication attitude	1.47±0.04	2.52±0.03	3.30±0.09
medication skills	0.56±0.01	0.66±0.01	0.88±0.01
medication behavior	1.85±0.02	2.68±0.02	3.55±0.02

M = Mean; SD = Standard deviation.

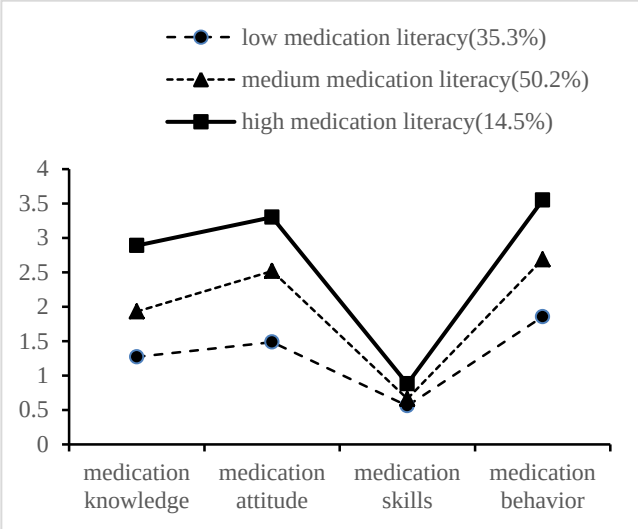

Figure 1 Mean scores for each dimension of the three-profile model of medication literacy (n = 544).

3.3 Predictors of Medication Literacy

Statistically significant differences (p<0.05) were found in age, educational level, residence, occupational status, type of work, per capita monthly household income, and monitored blood pressure. Significant differences (p<0.05) were also observed in PSSS, GSES, and BIPQ scores across the three latent categories (all see Table 1).

Potential medication literacy in patients was used as the dependent variable. Additionally, demographic information, disease characteristics, variables with statistically significant results related to medication literacy, PSSS, GSES, and BIPQ scores were incorporated into a multivariate logistic regression model. The coding of the independent variables was detailed in Table 4.

Table 4 Assignment of independent variables in multiple logistic regression

Variables	Assignment of variables
Latent categories	low medication literacy=1, medium medication literacy=2, high medication literacy=3
Age	18-40 years=1, 41-50 years=2, 51-59 years=3
Degree of education	junior high school and below=1, technical secondary school/senior high school=2, junior college/college degree and above=3
Residence	urban=1, rural=2
Occupational status	employed=1, unemployed or jobless=2, retired=3
Type of work	mainly manual labor=1, mainly mental labor=2, neither=3
Average monthly household income	<5,000 RMB=1, 5,000-10,000 RMB=2, >10,000 RMB=3
Monitored blood pressure	monitored=1, not monitored=2

The results revealed that an education level of junior high school or below, a personal monthly income of less than 5,000 RMB, PSSS scores, GSES scores, and BIPQ scores were potential influencing factors of medication literacy among young and middle-aged hypertensive patients (P<0.05), as shown in Table 5.

Table 5 Multinomial logistic regression analysis of factors affecting profile membership (n=544)

Variable	High medication literacy (Ref)					
	Low medication literracy			Moderate medication literacy		
	OR	95%CI	*P* Value	OR	95%CI	*P* Value

Education（Ref：Junior college/ College degree or above）						
Junior middle school and below	6.553	1.916-22.408	0.003	2.303	1.042-5.093	0.039
Senior school or technical secondary school	3.316	0.848-12.967	0.085	0.951	0.473-1.909	0.887
Per capita monthly household income（Ref：＞10,000 RMB）						
＜5,000 RMB	3.842	1.122-13.147	0.032	0.919	0.352-2.399	0.862
5,000-10,000 RMB	2.307	0.818-6.509	0.114	1.536	0.799-2.950	0.198
PSSS	0.877	0.835-0.921	＜0.001	0.963	0.927-1.000	0.049
GSES	0.812	0.734-0.899	＜0.001	0.887	0.818-0.962	0.004
BIPQ	1.135	1.081-1.192	＜0.001	1.047	1.008-1.087	0.017

PSSS, the Perceived Social Support Scale; GSES, the General Self-Efficacy Scale; BIPQ, the Brief Illness Perception Questionnaire.

4. Discussion

Medication literacy is a key factor in determining the use of health-related information, promoting health, and improving the quality of life. However, in China, young and middle-aged patients with hypertension have poor medication literacy and adherence [18,19]. Unlike previous investigations [20,21], this study firstly utilized a person-centered approach and empirically focused on the characteristics of medication literacy among young and middle-aged Chinese hypertensive patients, thereby complementing the limitations of previous studies and offering a novel perspective for future research on medication literacy.

This study revealed that the medication literacy score for young and middle-aged hypertensive patients was 28.78±7.58, reflecting an intermediate level with significant potential for improvement. While scores marginally exceeded those reported in prior research [22], this variance likely reflected divergent sample characteristics across studies. Meanwhile, latent profile analysis identified three distinct medication literacy profiles: low (35.3%), medium (50.2%), and high (14.5%) groups, establishing a tripartite classification of patient capabilities. Also, significant intergroup variations emerged across educational level, per capita monthly family income, PSSS, GSES, and BIPQ scores (Tables 1-3, Figure 1), confirming population heterogeneity. This analysis offered a fresh perspective, deepened insights into the nature of medication literacy, and provided references for subsequent interventions targeting different groups of young and middle-aged patients with hypertension.

In this study, patients with junior high school or below were significantly more likely to be categorized into low medication literacy groups compared to their counterparts with higher educational attainment (Table 5). Along with previous studies, these findings also revealed that higher educational levels were associated with better medication literacy, such as knowledge, positive attitudes, and good practices [23], identifying formal education as a key modifiable determinant of medication literacy. To address these challenges, this study highlighted the need for tailored educational approaches to address the needs of different medication literacy groups, emphasizing the importance of utilizing patient-centered visual tools (such as graphical medication schedules and 3D animated vascular models) and short videos to optimize knowledge retention in this target population [24].

The study also found that individuals with monthly household incomes below 5,000 RMB demonstrated a significantly higher propensity for classification into the low medication literacy, highlighting their role in determining medication literacy in young and middle-aged patients with hypertension. This also agreed with other studies conducted in China which found that socioeconomically advantaged patients exhibited reduced psychosocial stressors but enhanced health maintenance behaviors (such as proactive engagement in preventive healthcare measures, increased frequency of clinical consultations and utilization of premium healthcare services) [25]. These findings underscored the imperative for nursing professionals to integrate socioeconomic status evaluations into comprehensive care frameworks.

Aligned with a longitudinal analysis [26], this study substantiated the critical role of social support systems in enhancing medication literacy among young and middle-aged populations with hypertension. Optimal social support provision facilitates both emotional comfort and health information accessibility, thereby fostering the development of medication literacy through dual channels. In addition, strengthening the support networks within families, such as enhancing emotional care and providing practical assistance from children and relatives, can provide significant protection against low medication literacy. Thus, nursing staff should implement routine social support assessments and develop family inclusive care protocols to optimize therapeutic alliances and medication literacy outcomes.

Along with prior studies [16,27], this study also revealed a significant positive correlation between patients' self-efficacy scores and their medication literacy levels. Higher self-efficacy can foster a more resolute problem-solving attitude and better resistance to the negative impacts of health-related challenges. Therefore, clinical nurses should strategically integrate self-efficacy assessments into routine health education protocols for young and middle-aged patients with hypertension. They should encourage patients with higher self-efficacy to serve as role models and provide support and guidance to those with lower self-efficacy, which helps them approach hypertension with a positive mindset. In addition, sharing personal experiences related to the disease may be beneficial. So, nursing staff should encourage patients to establish milestones and regularly summarize their disease experiences to enhance self-efficacy and improve medication literacy.

The findings of this study were consistent with those of previous studies that showed negative correlation between disease perception scores and medication literacy levels [28,29]. Illness perception includes disease self-perception, causes and potentials consequences, and control, which means whether anything can be done regarding the disease. At the same time, disease self-perception can provide information to formulators of public health policies so that they can take measures aimed at encouraging the practice, especially with regard to the low medication literacy of young and middle-aged hypertensive populations. These findings underscored the importance of structured psychological evaluation protocols for routine nursing assessments. They should focus on addressing the needs of patients with high disease perception scores, alleviating their negative emotions, and helping them develop a more accurate understanding of their condition through cognitive behavioral therapy. Additionally, nurses should encourage patients to take the initiative to learn about their medications.

Limitations:

This study has some limitations. First, the exclusive recruitment of participants from Zhejiang Province created geographical homogeneity, as regional variations in socioeconomic status, cultural practices, and healthcare infrastructure may influence medication literacy patterns. Second, the cross-sectional design inherently restricted the causal interpretation of the observed associations between the variables. Prospective longitudinal studies are recommended to elucidate the temporal relationships and evaluate the sustained impact of medication literacy interventions. Third, exclusive reliance on self-reported measures introduced potential measurement errors, including social desirability bias and inaccuracies in retrospective recall. Finally, the restricted age range (young and middle-aged adults) limited the understanding of developmental trajectories in medication management competencies.

5. Conclusion

Overall, this study elucidated the subgroup characteristics of medication literacy among young and middle-aged Chinese patients with hypertension. This classification provided compelling evidence of the diversity of medication literacy within this population. The predictors included education level, per capita monthly household income, social support, self-efficacy, and disease perception. In practice, accurately assessing and addressing the level of medication literacy among young and middle-aged hypertensive patients is crucial for developing an effective intervention program. This study also provided a theoretical basis for enhancing medication literacy among young and middle-aged patients with hypertension in the future.

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Conflicts of Interest: The authors declare that they have no competing interests (political, personal, financial, religious, ideological, academic, or any other) in relation to this manuscript.

Ethics Approval: This study was performed in line with the principles of the Declaration of Helsinki. Ethics approval was granted by the Ethics Committee of Huzhou University (approval No. 202240703).

Consent to Participate: Written informed consent was obtained from all individual participants included in the study.

Consent for Publication: Not applicable.

Authors are responsible for correctness of the statements provided in the manuscript.

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