

Current Status and Influencing Factors of Self-Management Cognition among Elderly Patients with Diabetes in Hainan

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Abstract: To investigate the current status of self-management cognition among elderly patients with diabetes in Hainan and to analyze its influencing factors, so as to provide a basis for developing region-specific intervention strategies. **Methods** A cross-sectional survey was conducted. From November 2025 to March 2026, 156 inpatients and outpatients aged ≥ 60 years with type 2 diabetes were conveniently sampled from the Department of Endocrinology of a tertiary hospital in Hainan. Data were collected using a general information questionnaire and the 2-Type Diabetes Self-Care Scale (2-DCSC), and analyzed by t-tests, analysis of variance, and multiple linear regression with SPSS 27.0. **Results** The total self-management score was 89.36 ± 12.74 , indicating a moderate level; 127 patients (81.41%) were at the moderate level. The medication management dimension scored the highest (12.35 ± 2.16), whereas foot care scored the lowest (9.42 ± 3.05). Multiple linear regression identified sex, chronic complications, occupation, and disease duration as independent influencing factors (all $P < 0.05$), which together explained 34.0% of the total variance. **Conclusions** Self-management cognition among elderly diabetic patients in Hainan is suboptimal and is shaped jointly by disease-related and regional factors. It is necessary to establish a stratified health education system that incorporates local dietary culture and climatic characteristics, while strengthening family/social support and continuity of care.

Keywords: diabetes mellitus; elderly patients; self-management; cognition; influencing factors; Hainan region

1. Introduction

With the rapid aging of the global population, diabetes mellitus has become a major public

health problem threatening the health of older adults. Data from the International Diabetes Federation indicate that the number of people with diabetes continues to rise worldwide, with type 2 diabetes accounting for the vast majority and imposing a heavy burden of complications[1]. China is a country with a large diabetic population, and Hainan has a relatively high degree of aging, accompanied by a increasing proportion of elderly patients with diabetes. Diabetes self-management is a core component of disease control, covering diet, exercise, medication, blood glucose monitoring, foot care, and the management of hypo- and hyperglycemia. It can effectively control blood glucose, prevent complications, and improve quality of life[2]. Self-management theory emphasizes that enhancing patients' self-management capacity can effectively control disease symptoms and improve health outcomes. However, most previous studies have focused on inland regions, and systematic investigations of self-management cognition among elderly diabetic patients in Hainan—a tropical region—remain scarce. Based on this, the present study focused on the regional characteristics of Hainan to investigate the current status of self-management cognition and its influencing factors, aiming to provide empirical evidence for targeted health education and interventions.

2. Objects and Methods

2.1 Study Subjects

Using convenience sampling, elderly diabetic patients treated as inpatients or outpatients in the Department of Endocrinology of a tertiary hospital in Hainan from November 2025 to March 2026 were enrolled. The inclusion criteria were: (1) age ≥ 60 years, a diagnosis of type 2 diabetes consistent with WHO diagnostic criteria; (2) basic communication ability; and (3)

informed consent and voluntary participation. The exclusion criteria were: (1) cognitive impairment involving language, hearing, or other domains; and (2) severe cardiac, cerebral, or pulmonary dysfunction. The sample size was estimated as 5-10 times the number of scale items, with an additional 20% allowance for invalid questionnaires, yielding a final sample of 156. The study was approved by the hospital ethics committee, and all participants provided written informed consent.

2.2 Study Instruments

(1) General information questionnaire: covering sociodemographic characteristics (sex, age, education level, marital status, occupation, per capita monthly household income, and medical payment method) and disease-related information (disease duration, family history, chronic complications, treatment regimen, fasting blood glucose, 2-hour postprandial blood glucose, and glycosylated hemoglobin).

(2) 2-Type Diabetes Self-Care Scale (2-DCSC)[3]: developed by Wang Jingxuan et al., this scale comprises 26 items across six dimensions-diet management (6 items), exercise management (4 items), medication management (3 items), blood glucose monitoring (4 items), foot care (5 items), and management of hypo- and hyperglycemia (4 items). It uses a 5-point Likert scale (1 = "not at all" to 5 = "always"), with a total score ranging from 26 to 130; a higher score indicates better self-management. Scores < 52 indicate a low level, 52-91 a moderate level, and > 91 a high level. In the present study, the Cronbach's α coefficient of the scale was 0.87, and its construct validity was satisfactory, supporting its applicability to elderly diabetic patients.

2.3 Statistical Methods

Data were analyzed using SPSS 27.0, with a significance level of $\alpha = 0.05$. Normally distributed continuous variables are expressed as mean $\pm$ standard deviation, and categorical variables as frequencies and proportions. Independent-sample t-tests were used for between-group comparisons of binary variables, and one-way analysis of variance for multi-category variables. Variables with $P < 0.05$ in the univariate analysis were entered into a multiple linear regression model to identify independent influencing factors of self-management cognition.

3. Results

3.1 General Characteristics of the Study Subjects

A total of 156 elderly diabetic patients were included, comprising 85 women (54.5%) and 71 men (45.5%), with a mean age of 68.52 ± 4.86 years; 52.6% were 65-69 years old. Education levels were generally low, with 149 patients (95.5%) having an education of primary school or below. Most participants were married (137, 87.8%), and the main occupations were worker (37.8%) and farmer (33.3%). A total of 63 patients (40.4%) had a per capita monthly household income < 1000 CNY, and medical expenses were mainly covered by urban resident basic medical insurance (46.2%) and urban employee basic medical insurance (43.6%). Disease duration of 5-10 years was most common (43.6%); 128 patients (82.1%) had no family history, and 101 (64.7%) had no chronic complications. The mean fasting blood glucose was 6.06 ± 1.13 mmol/L, 2-hour postprandial blood glucose was 8.66 ± 0.83 mmol/L, and glycosylated hemoglobin was $5.50 \pm 1.12\%$.

3.2 Current Status of Self-Management Cognition

The total self-management score of the 156 patients was 89.36 ± 12.74 , corresponding to a moderate level. Specifically, 12 patients (7.69%) were at a low level, 127 (81.41%) at a moderate level, and 17 (10.90%) at a high level, indicating that the vast majority fell into the moderate category. The dimension scores are shown in Table 1; medication management scored the highest (12.35 ± 2.16) and foot care the lowest. Diet management (17.25 ± 4.12) and blood glucose monitoring (11.36 ± 2.87) were also relatively weak, with diet management showing the greatest inter-individual variability.

Table 1. Dimension Scores of Self-Management (n = 156, $\bar{x} \pm s$)

Dimension	Items	Score range	Mean score ($\bar{x} \pm s$)
Medication management	3	3-15	12.35 ± 2.16
Hypo-/hyperglycemia management	4	4-20	14.26 ± 3.08
Exercise management	4	4-20	13.18 ± 3.25
Diet management	6	6-30	17.25 ± 4.12
Blood glucose	4	4-20	11.36 ± 2.87

monitoring			
Foot care	5	5-25	9.42 ± 3.05

3.3 Influencing Factors of Self-Management Cognition

The univariate analysis showed that women had a higher self-management score (92.15 ± 13.45) than men (85.86 ± 11.23), and the difference was statistically significant ($t = 2.106$, $P = 0.037$); patients without chronic complications scored higher (93.56 ± 11.87) than those with

complications (82.15 ± 13.26) ($t = 4.752$, $P < 0.001$). Among the multi-category variables, statistically significant differences were observed across occupations ($F = 5.126$, $P = 0.007$) and disease durations ($F = 3.692$, $P = 0.027$): workers scored lower than farmers and employees of public institutions, and patients with a disease duration < 5 years scored higher than those with longer durations. Education level, per capita monthly household income, and treatment regimen did not differ significantly (all $P > 0.05$). Details are presented in Table 2.

Table 2. Univariate and Multivariate Analyses of Influencing Factors of Self-Management Cognition

Variable	Grouping	Score ($\bar{x} \pm s$)	t/F	P
Sex	Male / Female	85.86 / 92.15	$t = 2.106$	0.037
Chronic complications	Absent / Present	93.56 / 82.15	$t = 4.752$	< 0.001
Occupation	Farmer / Worker / Institution	91.25 / 86.12 / 92.68	$F = 5.126$	0.007
Disease duration	< 5 yr / 5-10 yr / > 10 yr	93.25 / 88.69 / 85.12	$F = 3.692$	0.027

The variables with $P < 0.05$ in the univariate analysis (sex, chronic complications, occupation, and disease duration) were entered into the multiple linear regression model. Model diagnostics showed that all variance inflation factors (VIF) were < 10 , indicating no multicollinearity, and the residuals were normally distributed, supporting good model applicability ($F = 6.710$, $P < 0.001$, $R^2 = 0.400$,

adjusted $R^2 = 0.340$). The results indicated that all four variables were independent influencing factors of self-management cognition (all $P < 0.05$): women, patients without chronic complications, farmers or employees of public institutions, and those with a disease duration < 5 years had relatively higher cognition levels. Details are shown in Table 3.

Table 3. Multiple Linear Regression Analysis of Influencing Factors of Self-Management Cognition

Variable	β	SE	β	t	P
Constant	72.315	6.824	-	10.597	< 0.001
Sex (female)	2.957	1.324	0.138	2.234	0.027
Chronic complications (absent)	8.762	1.841	0.315	4.759	< 0.001
Occupation	-4.128	1.576	-0.189	-2.620	0.010
Disease duration	3.894	1.633	0.173	2.385	0.018

4. Discussion

4.1 Current Status of Self-Management Cognition

In this study, the total self-management score of elderly diabetic patients was 89.36 ± 12.74 , with 81.41% at a moderate level, consistent with the findings of most domestic studies, suggesting that overall self-management capacity is acceptable but far from ideal[4]. At the dimension level, medication management had the highest scoring rate (82.3%), attributable to the relative simplicity of medication-taking behavior and the repeated emphasis placed by health care professionals on adherence; foot care had the lowest scoring rate (43.8%), closely

related to the hot and humid climate of Hainan, in which the feet are prone to maceration and infection and patients lack awareness of moisture prevention and infection control.

4.2 Analysis of Influencing Factors

Regarding sex, women had a higher cognition level than men ($P < 0.05$), in line with domestic research. Women generally pay more attention to health, take the initiative to learn, and participate more actively in health education, with better dietary and exercise habits[5]. Men are more likely to smoke and drink, eat irregularly, and show weaker self-discipline. Chronic complications were the most significant influencing factor ($P < 0.001$), with patients without complications showing higher

cognition[6-7]. Those with complications have more severe conditions, limited mobility, and more complex treatment regimens, making management more difficult. Employees of public institutions tend to have better education and economic conditions and higher health literacy; farmers benefit from adequate physical labor and self-produced food ingredients that facilitate dietary control; workers often work night shifts, eat irregularly, and experience greater stress, with fewer opportunities for medical consultation and health education. Regarding disease duration, patients with a duration < 5 years had higher cognition ($P < 0.05$), showing a trend of "the shorter the duration, the better the cognition," possibly because newly diagnosed patients attach greater importance to their health, whereas those with longer durations tend to develop the "non-adherence despite long illness" fatigue[8-9].

5. Conclusion

The self-management cognition of elderly patients with diabetes in a tertiary hospital in Hainan was generally at a moderate level, with medication management being relatively good and foot care the poorest, while diet management and blood glucose monitoring were weak links. Sex, chronic complications, occupation, and disease duration were independent influencing factors. It is essential to build a stratified health education system that incorporates Hainan's dietary culture and climatic characteristics, strengthen interventions for high-risk groups, and enhance family and social support, so as to improve patients' self-management capacity.

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