



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19

Pandemic in Wenzhou, China*

พฤติกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพล
ในผู้ป่วยสูงอายุที่เป็นโรคเบาหวานชนิดที่ 2 หลังการระบาดของ
ของโควิด-19 ในเมืองเหวินโจว ประเทศจีน*

Weijing	Zhang**	เหวยเสียน	จาง**
Rungrat	Srisuriyawet***	รุ่งรัตน์	ศรีสุริยเวศน์***
Saifone	Moungku****	สายฝน	ม่วงคุ้ม****

Abstract

In the aftermath of the COVID-19 pandemic, despite healthcare recovery and digital health additions, diabetes self-management behavior (DSMB) among elderly patients in China remains poor, resulting in increased complications, mortality, and economic burden. This predictive correlational study investigated diabetes self-management behavior among elderly type 2 diabetes mellitus patients post-COVID-19 in Wenzhou, China, examining potential predictors including health literacy, perceived diabetes self-efficacy, and social support. Purposive sampling was conducted with 109 early elderly patients, aged 60-69 years, from the diabetes outpatient department at the First Affiliated Hospital of Wenzhou Medical University. Data was collected using questionnaires including the Diabetes Self-Management Behavior Scale, Health Literacy Management Scale for Chronic Diseases, Diabetes Self-efficacy Scale, and Social Support Rating Scale. Data analysis was conducted using descriptive statistics and multiple linear regression.

The findings revealed that diabetes self-management behavior in elderly patients was at a low level ($M = 34.53$, $SD = 9.65$). Perceived diabetes self-efficacy was the only factor that could significantly predict diabetes self-management behavior ($\beta = 0.837$, $p < .001$), explaining 65.8% of the variance in diabetes self-management behavior. Neither health literacy ($\beta = -0.070$, $p = 0.377$) nor social support ($\beta = 0.045$, $p = 0.535$) demonstrated significant predictive value.

The findings indicate that within the rapidly changing Chinese cultural context after the COVID pandemic, healthcare for elderly diabetic patients should prioritize building patients' confidence in managing their own condition.

Keywords: Elderly; Self-efficacy; Self-management behavior; Type 2 diabetes mellitus

* Master's thesis, Master of Nursing Science Program (International Program), Faculty of Nursing, Burapha University

** Graduate student of Nursing Science Program (International Program), Faculty of Nursing, Burapha University

*** Corresponding author, Associate Professor, Faculty of Nursing, Burapha University;

e-mail: rungrat@go.buu.ac.th

**** Assistant Professor, Faculty of Nursing, Burapha University

Received 28 April 2025; Revised 10 July 2025; Accepted 17 July 2025



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

บทคัดย่อ

หลังการระบาดใหญ่ของโควิด-19 แม้จะมีการฟื้นตัวของบริการทางการแพทย์ และการเพิ่มขึ้นของการดูแลสุขภาพผ่านอินเทอร์เน็ต พฤติกรรมการจัดการตนเองของผู้ป่วยเบาหวาน ในกลุ่มผู้สูงอายุในประเทศจีนยังคงอยู่ในระดับต่ำ ส่งผลให้เกิดภาวะแทรกซ้อน ความพิการ อัตราการเสียชีวิต และภาระทางเศรษฐกิจที่เพิ่มขึ้น การศึกษาสหสัมพันธ์เชิงทำนายครั้งนี้ มีวัตถุประสงค์เพื่อศึกษาพฤติกรรมการจัดการตนเองของผู้ป่วยเบาหวาน ในผู้ป่วยสูงอายุที่เป็นโรคเบาหวานชนิดที่ 2 ในช่วงหลังการระบาดของโควิด-19 ในเมืองเหวินโจว สาธารณรัฐประชาชนจีน และศึกษาปัจจัยที่มีอิทธิพล ได้แก่ ความรอบรู้ด้านสุขภาพ การรับรู้ความสามารถของตนเองในการจัดการเบาหวาน และการสนับสนุนทางสังคม เลือกลุ่มตัวอย่างแบบเจาะจง จำนวน 109 คน จากแผนกผู้ป่วยนอกเบาหวานของโรงพยาบาลในเครือแห่งแรกของมหาวิทยาลัยการแพทย์ เป็นผู้ป่วยสูงวัยตอนต้น อายุ 60-69 ปี เก็บข้อมูลโดยใช้แบบสอบถาม ได้แก่ แบบประเมินพฤติกรรมการจัดการตนเอง แบบวัดความรอบรู้ด้านสุขภาพสำหรับโรคเรื้อรัง แบบวัดการรับรู้ความสามารถของตนเอง และแบบวัดการสนับสนุนทางสังคม วิเคราะห์ข้อมูลด้วยสถิติเชิงพรรณนา และสถิติ multiple linear regression

ผลการวิจัยพบว่า พฤติกรรมการจัดการโรคเบาหวานในผู้ป่วยสูงอายุอยู่ในระดับต่ำ ($M = 34.53$, $SD = 9.65$) การรับรู้ความสามารถของตนเองในการจัดการเบาหวาน เป็นปัจจัยเดียวที่มีอิทธิพลต่อพฤติกรรมการจัดการโรคเบาหวานได้อย่างมีนัยสำคัญ ($\beta = 0.837$, $p < .001$) และสามารถอธิบายความแปรปรวนในพฤติกรรมการจัดการโรคเบาหวาน ได้ถึงร้อยละ 65.8 ในขณะที่ความรอบรู้ด้านสุขภาพ ($\beta = -0.070$, $p = 0.377$) และการสนับสนุนทางสังคม ($\beta = 0.045$, $p = 0.535$) ไม่มีความสัมพันธ์อย่างมีนัยสำคัญทางสถิติ

ผลการศึกษา ชี้ให้เห็นภายใต้บริบทวัฒนธรรมจีนที่เปลี่ยนแปลงไปอย่างรวดเร็วหลังการระบาดของโควิด การดูแลสุขภาพของผู้ป่วยสูงอายุเบาหวาน ควรให้ความสำคัญกับการสร้างความมั่นใจของผู้ป่วยในการจัดการกับภาวะโรคของตนเอง

คำสำคัญ: ผู้สูงอายุ การรับรู้สมรรถนะแห่งตน พฤติกรรมการจัดการตนเอง โรคเบาหวานชนิดที่ 2

* วิทยานิพนธ์หลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรสูตตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

** นักศึกษา หลักสูตรพยาบาลศาสตรมหาบัณฑิต (หลักสูตรสูตตรนานาชาติ) คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา

*** ผู้เขียนหลัก รองศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา e-mail: rungrat@so.buu.ac.th

**** ผู้ช่วยศาสตราจารย์ คณะพยาบาลศาสตร์ มหาวิทยาลัยบูรพา



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

Background and significance

Type 2 diabetes mellitus (T2DM) is a chronic metabolic disorder characterized by insulin resistance and impaired insulin secretion, and a critical public health issue globally (American Diabetes Association, 2023). China has the largest diabetic population globally. Elderly individuals aged 60 and above constitute 40.0-50.0% of the diabetic population in China with only 30.8-50.6% of elderly patients meeting the recommended Glycosylated Hemoglobin, Type A1C (HbA1c) levels (HbA1c<7.0%) (Li et al., 2020). Poor glycemic control exacerbates the risk of macrovascular and microvascular complications, including cardiovascular disease, diabetic nephropathy, retinopathy, and neuropathy, leading to increased disability, mortality, and healthcare costs (Lu & Gao, 2021).

Diabetes Self-Management Behavior (DSMB) refers to a series of preventive and therapeutic activities that diabetic patients undertake under the guidance of medical staff, aiming to control blood sugar levels and prevent or delay the occurrence of complications. DSMB encompasses aspects such as diet, exercise, smoking cessation management, blood glucose monitoring, foot care, medication administration, and psychosocial management (American Diabetes Association, 2018; Chinese Diabetes Society, 2021). Effective self-management can assist diabetic patients in controlling blood glucose levels, maintaining glycated hemoglobin levels, slowing down disease progression, reducing complications, improving medication compliance, enhancing quality of life, and increasing diabetes knowledge.

The COVID-19 pandemic impaired diabetes management, with studies showing elevated blood glucose levels in diabetic patients (Sun et al., 2020). China has entered a "post-epidemic era" characterized by disease fluctuations and potential localized outbreaks. Research in Zhejiang Province found poor self-management among elderly T2DM patients due to post-epidemic impacts (Wang & Zhao, 2022). Despite healthcare service restoration, ongoing resource constraints and infection control measures continue disrupting elderly diabetic patients' self-management. Patients face difficulties accessing appointments and timely consultations. Healthcare providers have adopted digital platforms including telemedicine and online services to reduce patient clustering and infection risks while improving service efficiency. However, elderly diabetic patients' limited technological proficiency creates barriers to these digital solutions, potentially worsening diabetes self-management. Additionally, prolonged pandemic-related stress may reduce patients' confidence in diabetes management, leading to resistance toward maintaining proper self-care behaviors.

Previous research demonstrates significant relationships between health literacy (HL), self-efficacy, social support, and DSMB, finding that HL positively correlates with DSMB while showing a negative correlation with HbA1c levels (Dai et al., 2017). Multiple studies have identified HL as a crucial indicator for effective DSMB (Zhu & Zhou, 2022). Self-efficacy is a crucial belief influencing self-management behaviors (Yu et al., 2018). Higher self-efficacy is associated with greater confidence in disease management, facilitating the development and maintenance of healthy self-management practices and ultimately improving survival quality. Additionally, it has been demonstrated that increased family support correlates with enhanced diabetes awareness among



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

patients, fostering more positive attitudes toward the condition and reducing negative emotional responses (Tang et al., 2019).

However, inconsistency exists in previous studies regarding the relationship between HL and DSMB (Zhu & Zhou, 2022). At the same time, China covers a vast territory, and there are differences, such as culture, life, and economy, among various regions, which leads to disparities in the self-management behaviors for diabetes in different areas. The prevalence rate of diabetes in eastern China has reached 12.2%. Although diabetes is on the rise in both urban and rural areas, the gap is narrowing. However, the prevalence rate in cities remains relatively high (Li et al., 2020). Therefore, the distinct regional determinants of Wenzhou including dietary habits, social support, economics, and medical accessibility highlight the need for context-specific studies.

Self-management behavior is different from lifestyle modification. Self-management refers to the comprehensive skill set for managing health, while lifestyle modification represents the specific behavioral changes as part of that management approach. Therefore, this study focuses on elderly patients aged 60-69 years in Wenzhou, China. The young elderly represent a critical demographic for early intervention, as they are more likely to benefit from preventive measures and self-management behavior. By exploring the roles of HL, self-efficacy, and social support in DSMB, this study aims to provide insights into effective strategies for improving diabetes management among elderly patients in Wenzhou. The findings will inform healthcare providers and policymakers in designing targeted interventions to enhance DSMB, reduce complications, and improve the quality of life for this vulnerable population.

Research objectives

To investigate DSMB and to examine potential predictors of DSMB, including HL, perceived diabetes self-efficacy, and social support among elderly patients with T2DM post-COVID-19 pandemic in Wenzhou, China.

Conceptual framework

The study was guided by the individual and family self-management theory (IFSMT) (Ryan & Sawin, 2009), integrated with the literature review. It emphasized the interaction of contextual factors (HL and social support), process factors (self-efficacy), and outcomes (DSMB). HL helps in making informed health decisions, self-efficacy reflects confidence in disease management, and social support provides emotional and practical resources. These variables might be able to predict DSMB, the dependent variable.



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

Methodology

A predictive correlational research design was applied in this study.

Population and sample

The population of the study was elderly patients with type 2 diabetes aged between 60-69 years old who visited the diabetes outpatient department (OPD) at the First Affiliated Hospital of Wenzhou Medical University in the Wenzhou metropolitan area.

The sample size was calculated using G*power 3.1.9.7. Linear multiple regression analysis was selected as the statistical test type. The sample size was increased by using a small effect size of 0.12 (Gray & Grove, 2020), with $\alpha = 0.05$, power = 0.80, and the number of predictors set at 3. Based on the power analysis, this study required at least 95 participants. Considering for missing or incomplete data, the sample size was increased by 15% to reduce errors. Therefore, the total sample size was 109.

One hundred and nine patients with T2DM aged 60-69 years were recruited through purposive sampling from the department between January and September 2024. The inclusion criteria were as follows:

1. Diagnosed with T2DM for ≥ 6 months.
2. Able to understand and communicate in the Chinese language.
3. No acute metabolic complications in the past 6 months (diabetic ketoacidosis: DKA), hyperosmolar hyperglycemic syndrome (HHS), severe hypoglycemic coma with blood glucose < 2.8 mmol/L and impaired consciousness, or lactic acidosis).
4. No severe cognitive impairment or documented dementia/Alzheimer's disease.
5. No end-stage organ failure (excluding ESRD, Child-Pugh Class C cirrhosis, or NYHA Class III-IV heart failure).
6. Absence of physical disabilities impacting self-management (no severe motor dysfunction, wheelchair use, or bedridden status).

Researchers placed recruitment posters at the hospital entrance and diabetes clinic. They screened patients at the diabetes clinic outpatient department via medical records, inviting those who met the inclusion criteria to participate. After obtaining informed consent, the researchers administered questionnaire surveys to participants.

Research instruments

The study involved collecting data through self-reported questionnaires after obtaining informed consent, with the entire process completed within 25 minutes.

The research utilized five main instruments, which were all in Chinese versions:

1. The Demographic Data Questionnaire (DDQ) was developed specifically for the study; it collected socioeconomic, demographic, and health-related information, including lifestyle habits and medical history.
2. The Diabetes Self-care Activities Scale (SDSCA) used the Chinese translations by Toobert et al. and Wan et al. (Wan et al., 2008). This 11-item scale measures self-care behaviors across six domains:



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

general diet, special diet, exercise, blood glucose monitoring, foot care, and medication. Items are rated on an 8-point scale (0-7), with higher scores indicating better self-management behavior. Average scores were classified as poor (≤ 4.1), medium (4.2-5.5), or good (≥ 5.6). Test-retest reliability was 0.83 ($p < 0.01$) in Wan et al.'s study and 0.89 ($p < 0.01$) in this study.

3. The Health Literacy Management Scale (HeLMS) adapted Sun et al.'s original version (Sun et al., 2012) to assess health literacy across eight dimensions: attitudes towards health, understanding, social support, socioeconomic factors, access to general health services, communication with health service providers, proactivity, and health information use. The 25-item scale uses a 5-point Likert format (1 = very difficult/very reluctant to 5 = no difficulty/very willing). Higher scores indicate better health management abilities. Cronbach's alpha coefficient was 0.89, originally, and 0.95 for this study.

4. The Diabetes Self-efficacy Scale (DSES) was translated into Simplified Chinese by Wan and Shang (Wan & Shang, 2009). This 26-item scale uses a 5-point Likert format (1-5), with higher scores indicating better self-efficacy. Cronbach's alpha coefficient was 0.894 in Wan and Shang's study and 0.91 in this study.

5. The Social Support Rating Scale (SSRS) was developed by Xiao (Xiao, 1994). This 10-item Chinese scale measures social support across three dimensions: objective, subjective, and utilization of support. Items are rated on a 4-point scale, with higher scores indicating greater social support. Cronbach's alpha coefficient was 0.89-0.94 in Xiao's study and 0.79 in this study.

Chinese versions of all instruments were used, having been tested and validated in previous studies with good validity and optimal reliability as indicated by Cronbach's alpha values. In this study, 30 participants were used to examine instrument reliability, and test-retest reliability for the SDSCA was retested.

Ethical considerations

Ethical approval was obtained from Burapha University's IRB (G-HS072/2566) and Wenzhou Medical University's Research Ethics Committee (KY2023-235, approved October 28, 2023). Participants provided informed consent after receiving comprehensive study information. Data were anonymized and securely stored with researcher-only access, and will be destroyed one-year post-publication.

Data collection

The researcher screened participants at a diabetes outpatient clinic and obtained written informed consent. Data were collected through a combination of self-administered questionnaires (51 patients) and reading questionnaires and answering (58 patients). To reduce bias, the measures included using a large-font questionnaire with section-by-section completion, standardized reading questionnaires, and respecting participants' preferences (e.g., skipping sensitive questions or pausing interviews). Self-reported data, such as glucose monitoring and medication use, were cross verified with medical records. Given elderly participants' potential visual or literacy challenges, researchers conducted 30-minute standardized reading questionnaires while documenting physical measurements (e.g., blood pressure, height, weight) from medical records. Questionnaires were checked for completeness on-site, and participants received small gifts as compensation, with care



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

taken to ensure the process did not disrupt regular patient visits.

Data analysis

SPSS Statistics 17 was used for data analysis. Data analysis was conducted using descriptive statistics and multiple linear regression. All assumptions were met including normality (Kolmogorov-Smirnov test, $p > .05$), no multivariate outliers (Mahalanobis distance $\chi^2 < 12.84$), and no multicollinearity (VIF < 5 , correlations $< .85$).

Results

The participants ($n = 109$) were predominantly female (53.2%), married (94.5%), and unemployed (62.4%), with a mean age of 64.3 years. Most participants lived with family or friends, and had independent daily living skills, low literacy levels, and monthly family incomes below 10,000 RMB. Regarding health status, 36.7% were overweight and 4.6% were obese, with 27.5% currently drinking alcohol and 21.1% smoking.

Regarding history of illness, most participants (70.6%) had diabetes for over 10 years, with 91.7% having comorbidities and 60.6% experiencing complications. The study revealed widespread poor diabetes management, with target HbA1c levels reached by only 14.7% of participants.

Overall diabetes self-management behaviors were inadequate among participants ($M = 34.53$, $SD = 9.65$). All behavioral domains including diet management, exercise engagement, glucose monitoring, and foot care showed suboptimal scores ($M = 1.73$ - 3.37). Medication compliance was the exception, demonstrating substantially higher performance ($M = 6.34$) relative to other activities (Figure 1).

Multiple linear regression findings demonstrated that diabetes self-efficacy emerged as the sole significant determinant of self-management practices ($\beta = .837$, $p < .001$), accounting for 65.8% of variance in self-management behaviors (Adj $R^2 = 65.8\%$, $F(3,105) = 70.12$, $p < .001$). Neither health literacy for diabetes ($\beta = -.070$, $p = .377$) nor social support ($\beta = .045$, $p = .535$) significantly influenced self-management outcomes (Table 1).

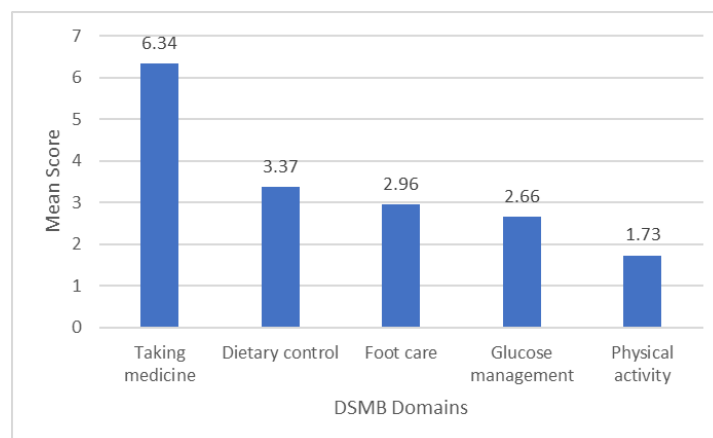


Figure 1 Mean scores of DSMB domains



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China
พฤติกรรมกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

Table 1 Summary of regression analysis for variables predicting diabetes self-management among the elderly with T2DM in the post COVID-19 pandemic in Wenzhou, China (n = 109)

Predicting variables	B	SE	β	t	p-value
Health literacy	-0.034	0.038	-0.07	-0.887	0.377
Self-efficacy	0.509	0.042	0.837	12.176	0.000
Social support	0.084	0.135	0.045	0.622	0.535
Constant	-7.299	3.878		-1.882	0.063

$R^2 = .667, Adj R^2 = .658, F_{(3, 105)} = 70.12, P\text{-value} < .001, S.E. = 5.648$

Note. B = unstandardized coefficient, SE = standard error, β = standardized coefficient, t = t-value, R^2 = coefficient of determination, F = F-statistic, S.E. = standard error of the estimate

Discussion

Diabetes self-management behaviors

An analysis of elderly type 2 diabetes patients in post-COVID Wenzhou identified poor self-management behaviors ($M = 34.53, SD = 9.65$), with contributing factors conceptualized through Individual and Family Self-Management Theory (Ryan & Sawin, 2009). The study population, characterized by advanced age (mean = 64.28 years) and limited educational attainment, demonstrated significant challenges in utilizing emerging digital health technologies, particularly WeChat-based diabetes management applications, despite enhanced technological infrastructure through 5G networks that enabled healthcare providers to deliver remote diabetes education and monitoring services (Ying et al., 2020).

Family support structures proved inadequate despite high rates of marriage (94.5%) and cohabitation with relatives (92.7%), as adult children experienced competing demands from eldercare responsibilities, child-rearing duties, and employment pressures (Chen et al., 2024). Socioeconomic factors compounded these difficulties, including unemployment (affecting 62.4% of participants), income limitations (73.4% earning less than 5,000 RMB monthly), and insufficient insurance coverage (only 19.3% had comprehensive plans). Research demonstrates that higher socioeconomic status is associated with improved diabetes self-management outcomes (Yang, 2024). Educational barriers were prevalent, with 41.3% of participants lacking primary education, which research indicates impairs patients' ability to comprehend and implement diabetes management strategies (Jin, 2024).

Disease chronicity emerged as an additional challenge, with 70.6% of participants having managed diabetes for 11-30 years, leading to treatment fatigue and reduced adherence motivation (Ryan & Sawin, 2009). Poor self-management practices resulted in suboptimal clinical outcomes, including uncontrolled glycemic levels, obesity (41.3% overweight) influenced by regional dietary patterns emphasizing high-carbohydrate consumption (Huang, 2019), persistent harmful behaviors



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

such as smoking (21.1%) and alcohol use (27.5%), in addition to inadequate healthcare engagement evidenced by 69.7% missing scheduled appointments. The study demonstrates that technological barriers, family system strain, economic hardship, educational deficits, and disease chronicity synergistically contributed to compromised diabetes self-management among elderly patients in post-pandemic Wenzhou.

Self-Efficacy as a Predictor of Diabetes Self-Management Behaviors

The findings of this investigation align with the study's hypotheses, confirming that diabetes self-efficacy serves as a significant predictor of self-management behaviors among elderly patients with type 2 diabetes mellitus (T2DM) during the post-COVID-19 pandemic in Wenzhou, China. Diabetes self-efficacy is conceptualized as individuals' confidence in their ability to utilize knowledge and skills effectively to maintain optimal glycemic control and prevent diabetes-related complications (Zhang et al., 2022). Within the theoretical framework of Individual and Family Self-Management Theory, diabetes self-efficacy exerts primary influence on the proximal outcomes of self-management behaviors.

Bandura's social cognitive theory posits that self-efficacy is developed through four primary sources: mastery experiences, vicarious learning, verbal persuasion, and physiological and emotional states. Among these factors, research demonstrates that mastery experiences constitute the most influential determinant of self-efficacy development. Specifically, successful experiences enhance efficacy expectations, whereas repeated failures diminish confidence in one's capabilities (Liu & Li, 2024). As individuals' efficacy expectations strengthen, their motivation to exert greater effort in self-management activities correspondingly increases. When patients with diabetes develop a conviction that their condition is manageable and cultivate confidence in their self-management competencies, the likelihood of improved self-management behaviors significantly increases.

Empirical evidence from multiple investigations supports the observed relationship between self-efficacy and diabetes management outcomes. A comprehensive study examining 489 patients with type 2 diabetes demonstrated that self-efficacy exerts both direct behavioral influences and indirect effects on health outcomes through its mediating role in self-management skill acquisition and application (Zhang et al., 2023). The significant association between self-efficacy and clinical outcomes has been further validated through longitudinal research, which established that diabetes patients who developed enhanced self-efficacy achieved substantially improved physical health outcomes following a two-year period of structured self-management interventions (Xia et al., 2022). These convergent findings underscore the critical importance of self-efficacy as both a predictor and mediator of successful diabetes self-management among elderly patients.

Conclusion

This study provides compelling evidence that diabetes self-efficacy is the primary determinant of self-management behaviors among elderly patients with type 2 diabetes in post-COVID Wenzhou, China. Self-efficacy outweighed traditional predictors like health literacy and social support, challenging



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China

พฤติกรรมจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

conventional intervention approaches and highlights the unique needs of elderly Chinese populations.

Applications of research findings

The results advocate for self-efficacy-focused interventions rather than traditional health literacy approaches. Practice-based training that builds confidence through achievable diabetes management tasks may be more effective than complex digital health education for elderly Chinese populations.

Suggestions for further research

Research priorities should focus on developing and testing culturally adapted self-efficacy enhancement interventions specifically designed for elderly Chinese patients with type 2 diabetes. Given the unique finding that self-efficacy outweighed traditional predictors, studies should examine the mechanisms underlying this relationship and identify optimal strategies for building diabetes management confidence within Chinese cultural frameworks.

References

- American Diabetes Association. (2018). 4. Lifestyle management: Standards of medical care in diabetes-2018. *Diabetes Care*, 41(Suppl. 1), S38-S50. <https://doi.org/10.2337/dc18-S004>
- American Diabetes Association. (2023). 5. Facilitating positive health behaviors and well-being to improve health outcomes: Standards of care in diabetes-2023. *Diabetes Care*, 46(Suppl. 1), S68-S96. <https://doi.org/10.2337/dc23-S005>
- Chen, J., Yan, R., & Xu, K. (2024). "One old and one small" pressure highlights how to deal with the worries of a moderately aging society? 005. <https://link.cnki.net/doi/10.28723/n.cnki.nsjbd.2024.003456>
- Chinese Diabetes Society. (2021). Guideline for the prevention and treatment of type 2 diabetes mellitus in China (2020 ed.). *Chinese Journal of Diabetes Mellitus*, 13(4), 315-409. <https://doi.org/10.3760/cma.j.cn115791-20210221-00095>
- Dai, Y., Liu, W., Li, J., & Li, M. (2017). Study on the correlation between health literacy and self-management ability in type 2 diabetic patients. *Journal of Guangxi University of Chinese Medicine*, 20(03), 15-20.
- Gray, J. R., & Grove, S. K. (2020). *Burns and Grove's the practice of nursing research - e-book: Appraisal, synthesis, and generation of evidence*. Elsevier Health Sciences. <https://books.google.co.uk/books?id=HmbyDwAAQBAJ>
- Huang, M. (2019). A probe into Wenzhou special snack of Zhejiang Province and its prevailing reasons. *Journal of Nanning Polytechnic*, 24(6), 5-7.
- Jin, D. (2024). Analysis of self-management behavior status and its influencing factors in elderly patients with hypertension comorbidity. *Journal of Doctors Online*, 14(10), 19-24. <https://next.cnki.net/>



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China
พฤติกรรมกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน
ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

- Li, Y., Teng, D., Shi, X., Qin, G., Qin, Y., Quan, H., Shi, B., Sun, H., Ba, J., Chen, B., Du, J., He, L., Lai, X., Li, Y., Chi, H., Liao, E., Liu, C., Liu, L., Tang, X., & ... Shan, Z. (2020). Prevalence of diabetes recorded in mainland China using 2018 diagnostic criteria from the American Diabetes Association: National cross sectional study. *British Medical Journal*, *369*, m997. <https://doi.org/10.1136/bmj.m997>
- Liu, H., & Li, J. (2024). Application effect of nursing method based on self-efficacy theory in patients with type 2 diabetes mellitus during medication. *Chinese Journal of Drug Abuse Prevention and Treatment*, *30*(11), 2053-2055. <https://doi.org/10.15900/j.cnki.zylf1995.2024.11.026>
- Lu, F., & Gao, Y. (2021). Occurrence and factors affecting common complications in patients with type 2 diabetes. *Chinese Journal of Public Health Engineering*, *20*(05), 746-747+750. <https://doi.org/10.19937/j.issn.1671-4199.2021.05.013>
- Ryan, P., & Sawin, K. J. (2009). The individual and family self-management theory: Background and perspectives on context, process, and outcomes. *Nursing Outlook*, *57*(4), 217-225.e6. <https://doi.org/10.1016/j.outlook.2008.10.004>
- Sun, H., Peng, H., & Fu, H. (2012). The reliability and consistency of health literacy scale for chronic patients. *Fudan University Journal of Medical Sciences*, *39*(3), 268-272. <https://doi.org/10.3969/j.issn.1672-8467.2012.03.009>
- Sun, X., Shi, F., Ma, J., Yang, M., Liu, W., Wang, L., & Liu, W. (2020). Study on glycemc profiles and emotional scales in diabetic patients after the outbreak of COVID-19. *Chinese Journal of Endocrinology and Metabolism*, *36*(8), 673-677. <https://doi.org/10.3760/cma.j.cn311282-20200611-00431>
- Tang, J., Yang, Q., Li, X., Wu, W. W., Li, Q., Niu, D., Bao, X., Ding, P., & Xu, L. (2019). Study on guiding effect of mental health of elderly patients with type 2 diabetes in community Chinese. *Journal of General Practice*, *17*(3), 433-435+507. <https://doi.org/10.16766/j.cnki.issn.1674-4152.000701>
- Wan, Q., & Shang, S. (2009). Study on reliability and validity of self-efficacy scale for diabetes mellitus patients. *Chinese Nursing Research*, *23*(17), 1589-1590. https://caod.oriprobe.com/articles/16688196/Study_on_reliability_and_validity_of_self_efficacy.htm
- Wan, Q., Shang, S., Lai, X., & Pan, J. (2008). A study on the reliability and validity of the self-management behaviour scale for patients with type 2 diabetes. *Chinese Journal of Practical Nursing*, *24*(7), 26-27. https://caod.oriprobe.com/articles/13385028/Study_on_the_reliability_and_validity_of_summary_o.htm
- Wang, Y., & Zhao, Y. (2022). Analysis of the status quo of self-efficacy and health knowledge cognition among diabetic patients in Shaoxing City and the influencing factors. *Chinese Journal of Public Health Management*, *38*(5), 647-650. <https://doi.org/10.19568/j.cnki.23-1318.2022.05.0019>



Diabetes Self-management Behaviors and Influencing Factors Among Elderly Patients
with Type 2 Diabetes Post-COVID-19 Pandemic in Wenzhou, China
พฤติกรรมกรรมการจัดการตนเองเกี่ยวกับโรคเบาหวานและปัจจัยที่มีอิทธิพลในผู้ป่วยสูงอายุที่เป็นโรคเบาหวาน
ชนิดที่ 2 หลังการระบาดของโควิด-19 ในเมืองเหวินโจว ประเทศจีน

- Xia, Z., Jiang, Y., Mao, F., Dong, W., Zhang, W., & Dong, J. (2022). Quality of life and its influencing factors among diabetic patients two years after a self-management intervention in six Provinces and cities in China: A follow-up study. *Chinese Journal of Public Health, 38*(3), 285-290. <https://doi.org/10.11847/zgggws1131688>
- Xiao, S. Y. (1994). The theoretical basis and research application of social support rating scale. *Journal of Clinical Psychiatry, 4*, 98-100.
- Yang, J. (2024). *Social support and health self-management in older patients with diabetes mellitus type 2 mellitus Relationship and mediation role studies*. <https://link.cnki.net/doi/10.26980/d.cnki.gcczc.2024.000275>
- Ying, J., Ran, X., & Zhong, L. (2020). Reflections on the diagnosis and treatment of diabetes during COVID-19 pandemic. *Journal of Chengdu Medical College, 15*(3), 293-296. <https://link.cnki.net/urlid/51.1705.R.20200324.1056.004>
- Yu, Y., Duan, X., Yang, L., & Xie, H. (2018). A correlation between self-efficacy, self-management behavior and quality of life in elderly diabetic patients in the community. *Journal of Mudanjiang Medical University, 39*(1), 123-126. <https://doi.org/10.13799/j.cnki.mdjyxyxb.2018.01.042>
- Zhang, X., Feng, S., Zeng, S., Zhao, X., Zhang, B., Zhao, X., Huang, Y., Chen, X., & Wan, B. (2022). Status quo and correlation analysis of electronic health literacy, self-efficacy and self-management behavior in patients with type 2 diabetes. *Journal of Modern Clinical Medicine, 48*(3), 170-174. <https://doi.org/10.11851/j.issn.1673-1557.2022.03.003>
- Zhang, X., Lin, Y., Jiang, Y., Zhang, L., Dong, M., Chi, H., Dong, H., Ma, L., Li, Z., & Chang, C. (2023). Mediating effect of self-efficacy on self-management ability and self-management behavior in patients with type 2 diabetes mellitus. *Journal of Peking University (Health Sciences), 55*(3), 450-455. <https://doi.org/10.19723/j.issn.1671-167X.2023.03.010>
- Zhu, R., & Zhou, L. (2022). Progress in health literacy in patients with type 2 diabetes. *Progress in Health Literacy in Patients with Type 2 Diabetes, 19*(10), 188-192. <https://doi.org/10.11986/j.issn.1673-873X.2022.010.045>