

# Readiness for Independent Self-Care and Self-Management among Middle-Aged Patients with Type 2 Diabetes Mellitus

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**Abstract:** Diabetes is a common chronic disease in clinical practice. The current global average prevalence is 2–6%, and more than 90% of patients have type 2 diabetes. Although there is a correlation between independent self-care and self-management, improving patients' self-care and self-management behaviors can effectively improve patients' quality of life. This study aimed to determine if a significant relationship exists between independent self-care and self-management. This study used a quantitative research design. The inclusion criteria included 198 participants using purposeful sampling. This study adopted a correlational research design to determine the association between self-care readiness (independent variable) and self-management (dependent variable). This study surveyed respondents using a three-part questionnaire, and their scores were recorded using the Demographic Profile Questionnaire, Transition Readiness Assessment Questionnaire (TRAQ), and Diabetes Self-Management Questionnaire (DSQM). The data were analyzed using statistical tools such as frequency, percentage, mean, standard deviation, Pearson R and hypothesis testing. The results showed a correlation between independent self-care and self-management in diabetic patients. These findings indicate that the respondents generally reported moderate to high levels of readiness and self-management, with more variability noted in self-management scores. Overall, the findings suggest that preparedness for independent self-care plays a statistically significant role in influencing self-management, although the strength of this relationship is relatively weak.

**Keywords:** Type 2 diabetes mellitus; Readiness for independent self-care; Self-management

**Online publication:** Oct 16, 2025

## 1. Introduction

### 1.1. Background

Type 2 Diabetes Mellitus is one of the most common chronic diseases and one of the most prolific killers threatening human beings and affecting their health. The disease poses significant challenges to human health, is

a major public health and medical problem, and has had a significant impact worldwide. Type 2 Diabetes Mellitus (T2DM) is a metabolic disorder characterized by chronically elevated blood glucose levels resulting from defects in insulin discharge, insulin action, or both <sup>[1]</sup>. In recent decades, diabetes has become one of the most prevalent and pressing problems. Diabetes is incurable and has the characteristic of being carried for life once it occurs. The best way to deal with diabetes is to prevent it in the first place. Many factors affect diabetes. Genetic and metabolic factors can affect the prevalence of the disease. Obesity, unhealthy diet, lack of exercise, and smoking can all affect the development of diabetes. Type 2 diabetes Mellitus is common in adults. Most cases are associated with aging, obesity, reduced exercise, and an unhealthy diet, leading to increased insulin resistance, impaired pancreatic beta cell function, and decreased glucose demand, resulting in increased blood sugar <sup>[2]</sup>.

Self-care ability is the individual's ability and practical willingness to master the correct knowledge of the disease, as well as the degree of strict implementation of the plan, which is the premise and necessary condition for implementing self-care. Self-care behaviors among diabetic patients, such as self-blood sugar monitoring, dietary control, proper medication use, and exercise, directly impact blood sugar control. Research results show that good self-care behaviors among diabetic patients can effectively control blood sugar levels, slow disease progression, and improve quality of life. This suggests that further improvement is needed in self-care behaviors among diabetic patients. Patients demonstrate good adherence to medication self-care behaviors, which is believed to be because most patients have a long history of diabetes, and medications are simple and readily accepted.

Self-management is also known as self-control. This refers to strategies based on self-diagnosis and sober self-knowledge that use personal inner strength to change behavior. These strategies are generally used to reduce the appearance of bad behavior and increase the appearance of good behavior. The concept of self-management developed as researchers discovered that humans have enormous potential to improve their behavior and health. Diabetes is a lifelong disease, and patient self-management is highly effective in controlling blood sugar. Effective self-management education can improve patients' self-management skills, help them recognize the importance of active participation in disease management, strengthen their confidence, maintain a positive attitude, and ultimately improve their condition <sup>[3]</sup>.

The effective control of diabetes cannot be solved by drugs alone, but by the patient's self-management in diet, exercise, blood sugar monitoring, foot care, and other behaviors. Carelessness in any link will lead to blood sugar fluctuations and complications. Studies have shown that only 26–29% of diabetic patients within the excellent level.

Once diagnosed, patients with diabetes should receive systematic self-management education to improve disease management skills and ensure high-quality home care behaviors. Effective disease health education can help patients with diabetes acquire accurate disease-related knowledge. By engaging in healthy eating, increasing physical exercise, implementing smoking cessation programs, and maintaining a healthy weight, they can enhance self-efficacy, cultivate self-management behaviors, slow disease progression, and improve quality of life. Health education and nursing interventions, based on understanding type 2 diabetes patients' educational level and disease awareness, provide diabetes education in various forms and provide exercise and dietary guidance. This can help improve patients' compliance with medical advice, their understanding of diabetes self-management, and their daily lives, thereby promoting blood sugar control and enhancing their quality of life and satisfaction <sup>[4]</sup>. Relevant studies have shown that applying health education to diabetic patients can improve their knowledge, compliance with medical advice, self-care ability, and quality of life <sup>[5]</sup>.

Studies have shown that demographic factors, disease treatment factors, psychosocial factors, and diabetes

knowledge are several significant factors that affect diabetes self-management. The cognition of the disease is a key factor in determining the patient's behavior, and the more knowledge a diabetic patient has, the better their self-management behavior will be. Only after the patient has a scientific understanding of the disease can they know the correct self-management methods, identify the behaviors that are not conducive to the disease, and achieve the consistency of knowledge and action. Health beliefs are the direct driving force of behavior. Research shows that positive health beliefs promote self-management behaviors and improve self-management abilities. Diabetes is a life-long disease that spends most of its energy in the community and at home, so self-empowerment and social support are essential. This paper explores the current status of independent self-care ability and self-management of patients with type 2 diabetes through investigation and research, and provides a theoretical basis for future measures to formulate and improve patients' living standards.

## 1.2. Theoretical framework

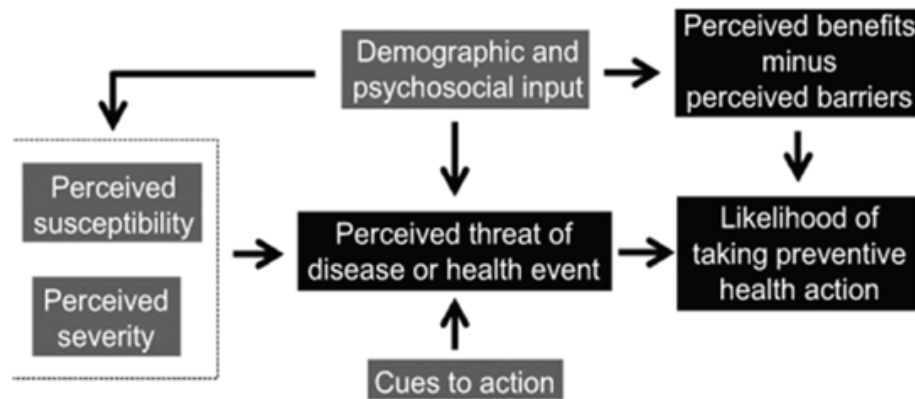
This study uses the health behavior theory's health belief model (HBM) as the theoretical framework. The health belief model (HBM) uses a social psychological approach to explain health-related behaviors, emphasizing the subjective psychological processes of individuals. The model posits that individuals' beliefs about health and illness influence their behaviors, thus impacting their physical and mental health.

The HBM is the earliest theoretical model used to explain and predict individual health behaviors and is currently widely used at home and abroad. This model was first proposed in the 1950s by Rosenstock and revised by Becker and Maiman to explain why some people refuse to adopt certain behaviors that are beneficial to health. The model specifies that individuals can adopt healthy behaviors if they perceive adverse health outcomes as serious, perceive themselves as susceptible, recognize the benefits of behaviors that reduce the likelihood of such outcomes as high, and determine the barriers to adopting these behaviors as low. The HBM is one of the most popular health promotion models that explains individuals' engagement in various health-promoting behaviors. The initial phase focuses on predicting individuals' behavioral responses to illness and the treatments they receive <sup>[6]</sup>. The adoption of health-promoting behaviors is associated with the following factors.

- (1) Perceived susceptibility to disease, that is, the overall harm that an individual thinks unhealthy behavior brings to them, as well as the probability and possibility that this behavior will cause their own disease.
- (2) Perceived disease severity, that is, how much the individual thinks that the disease caused by unhealthy behavior will bring them physical, psychological, and social harm.
- (3) Perceived benefits of behavior change, that is, the individual's recognition and evaluation of the benefits of changing destructive behaviors.
- (4) Perceived barriers to behavior change, that is, the possible adverse physical, psychological, and financial effects of a behavioral change perceived by an individual. Behavioral change is possible when the perceived benefits of behavioral change outweigh the disadvantages or obstacles; otherwise, the individual may maintain the original unhealthy behavior.

The HBM holds that when an individual perceives their susceptibility to a particular disease, recognizes the severity of the disease through various adjustment factors, and believes that the benefits of changing their bad behavior outweigh the harm, the individual will try to change their behavior accordingly. In clinical nursing work, the behavior of nursing objects can be changed through health education. Nursing workers first evaluate the clients' health beliefs and influencing factors, take adequate measures to help them establish or strengthen their health beliefs, and finally allow individuals to adopt health-friendly behaviors to promote health voluntarily.

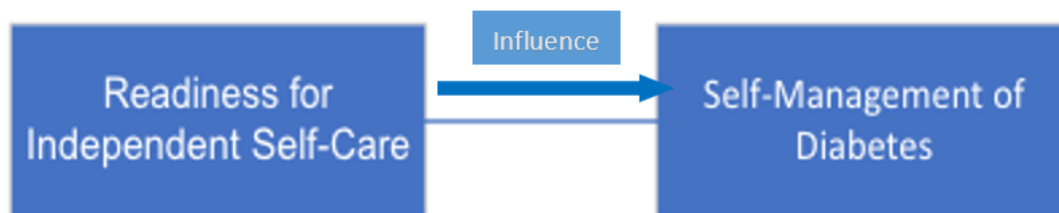
In this study, the researcher applies the concepts from this theory to reflect the impact of health behaviors on independent self-care and self-management. The independent variable, readiness for independent self-care, can be considered a cue to action because it prompts the respondents to see their condition as threatening their well-being. The dependent variable, self-management, on the other hand, is perceived as the likelihood to take initiative to maintain health or manage diabetes (see **Figure 1**).



**Figure 1.** Health belief model.

### 1.3. Research paradigm

**Figure 2** shows the perceived association of the variable's readiness for independent self-care and self-management among middle-aged patients with type 2 diabetes. The paradigm presents that a change in a patient's readiness for self-care can influence their levels of self-management of diabetes. The diagram concurs with the principles of the HBM.



**Figure 2.** Research paradigm.

## 2. Research methodology

### 2.1. Research design

This study used a quantitative research design to describe the extent of readiness for self-care and self-management of diabetes patients. Specifically, this research employed a correlational research design to determine the association between readiness for self-care (independent variable) and self-management (dependent variable).

### 2.2. Population and sampling

The study population comprised middle-aged patients with type 2 diabetes who were registered and diagnosed at the two hospitals mentioned in the research locale. The sample size was 198 respondents as determined by the

effect size calculation ( $\alpha = 0.05$ ,  $\beta = 0.80$ , small effect size of 0.20). The purposive sampling method was used to recruit participants.

### **2.2.1. Inclusion criteria**

- (1) 45–59 years old as referenced by the Chinese standard of middle-aged adults
- (2) Conscious and able to communicate
- (3) Can actively cooperate with the researcher
- (4) Diagnosed with diabetes mellitus for more than six months and has type 2 diabetes.

### **2.2.2. Exclusive criteria**

- (1) With severe complications of diabetes and other diseases
- (2) With severe disturbance of consciousness or mental illness or cognitive dysfunction
- (3) With impairment in communication, cooperation, and activities of daily living
- (4) Type 1 diabetes.

92 participants were randomly assigned to the People's Hospital of Dongying District and 106 to the People's Hospital of Guangrao, respectively, based on the inclusion and exclusion criteria. A total of 198 participants were identified as meeting the study requirements and were included in subsequent analyses.

## **2.3. Research locale**

The study was conducted at two hospitals in Dongying City, Shandong Province, China: The People's Hospital of Dongying District and The People's Hospital of Guangrao, both of which are regional general hospitals with endocrinology as a key department. From January to May 2024, data on type 2 diabetes admissions were collected following a structured research protocol. The research team consisted of two research assistants and the principal researcher, each with defined responsibilities. The research assistants were responsible for screening eligible patients through the hospital system, confirming their willingness to participate, issuing informed consent forms, guiding participants in completing questionnaires, clarifying any questions regarding the scale items, and ensuring completeness. They also verified the integrity of returned questionnaires and entered valid data into an Excel database. The principal researcher designed the research plan, established screening criteria and data collection procedures, and liaised with the ethics committees of both hospitals to obtain approval. In addition, the researcher trained the assistants, standardized questionnaire instructions and data entry protocols, supervised data collection, and randomly checked 10% of the questionnaires against electronic medical records to ensure authenticity. The researcher also led data collation, performed preliminary analyses, and managed unexpected issues such as patient dropouts. The sample size of 198 participants was calculated using the statistical formula for sample estimation (expected proportion 50%, allowable error 7%, 95% confidence level). Following feasibility adjustments that accounted for the estimated loss to follow-up and the actual number of hospital visits, the final sample met the requirements for both representativeness and statistical power.

## **2.4. Research instrument**

A three-part questionnaire was used in this study to survey the respondents. The first part covered the demographic profile of the participants and was developed by the researchers. It asked the respondents' age, sex, educational attainment, marital status, and monthly household income.

The second part was the Transition Readiness Assessment Questionnaire (TRAQ). The 20-item questionnaire assesses readiness of independent self-care in five major domains: managing medications, appointment keeping, tracking health issues, talking with providers, and managing daily activities. The scale uses a five-point rating scale: 1 – No, I do not know how; 2 – No, but I want to learn; 3 – No, but I am learning to do this; 4 – Yes, I have started doing this; and 5 – Yes, I always do this when I need to. The TRAQ is a valid measure of readiness for independent self-care and exhibited good reliability with an overall Cronbach alpha of 0.94.

The Diabetes Self-Management Questionnaire (DSQM) comprised the third part of the instrument. The 16-item questionnaire assesses self-care activities in glucose management, dietary control, physical activity, and healthcare use. The scale employs a three-point rating system, where 0 – “Does not apply to me”; 1 – “Applies to me to some degree”; 2 – “Applies to me to a considerable degree”; and 3 – “Applies to me very much”. The DSMQ is a reliable assessment of readiness for independent self-care, with an overall Cronbach alpha of 0.84.

## **2.5. Data collection procedure**

The research followed these phases of data collection.

### **2.5.1. Phase 1–Securing approval**

Before proceeding, this study sought approval from the Far Eastern University Ethical Review Board (FEU ERB). After approval, the researcher applied for ethical clearance for the study at Dongying District People’s Hospital of Dongying City, Shandong Province, and Guangrao County People’s Hospital of Dongying City, Shandong Province. The investigator coordinated with the Director of Nursing and other administrators upon approval.

### **2.5.2. Phase 2–Selecting the respondents**

With the help of the hospital staff, the researcher determined the eligibility of middle-aged patients with type 2 diabetes to participate in the study according to the inclusion criteria.

### **2.5.3. Phase 3–Securing informed consent**

After determining the eligibility of patients with diabetes to participate in the study, the researcher and hospital staff informed the study subjects about the general process of the study and obtained their signed informed consent.

### **2.5.4. Phase 4–Collecting data**

The researcher collected data using the research instruments discussed previously. The questionnaires were distributed to the participants.

### **2.5.5. Phase 5–Analyzing the collected data**

The collected data information was stored in a computer to ensure the security and confidentiality of the data and was used only for this research. The researcher used Microsoft Excel and Statistical Package for the Social Sciences (SPSS) for data analysis. A statistician’s assistance was also sought to test survey results statistically. After data collection was completed and stored electronically, all information was anonymized to ensure strict privacy and confidentiality.



## 2.6. Statistical treatment of data

Mean and standard deviation were used to summarize the level of readiness for independent self-care and self-management of diabetes. Spearman's rho was used to determine if there is a significant correlation between the two variables. The decision criteria for hypothesis testing were set at  $\alpha = 0.05$ , and SPSS version 23 was used as the statistical software.

## 3. Results and discussion

### 3.1. Problem No. 1.

The level of readiness for independent self-care of the respondents (see **Table 1**) in term of managing medication, appointment keeping, tracking health issues, talking with providers, managing daily activities and the overall readiness recorded.

**Table 1.** Mean level of readiness for independent self-care of the respondents (n = 198)

| Category                  | Mean score | Standard deviation (SD) |
|---------------------------|------------|-------------------------|
| Managing Medication       | 4.07       | 0.90                    |
| Appointment Keeping       | 4.09       | 0.90                    |
| Tracking Health Issues    | 3.84       | 1.09                    |
| Talking with Providers    | 4.50       | 0.85                    |
| Managing Daily Activities | 4.31       | 0.87                    |
| Overall                   | 4.16       | 0.79                    |

Notes: 1–2 (A low score suggests the individual needs more education and support in the relevant areas. Focus on areas where scores are lowest and provide targeted education); 2–3 (These scores indicate areas where the individual is learning or has started to implement the skills. Provide support and guidance to help them progress towards mastery); 3–4 (These scores indicate areas where the individual is learning or has started to implement the skills. Provide support and guidance to help them progress towards mastery); 4–5 (A high score indicates good transition readiness in that area. Continue to reinforce these skills and encourage continued independence).

**Table 1** presents the respondents' level of readiness for independent self-care. The average score in Managing Medication was between 4 and 5, indicating good transition readiness in that area. The mean score for Managing Medication was 4.07, with a standard deviation of 0.90. The participants had reasonable control over medication and took the medicine on time as required. Type 2 diabetes is a chronic disease characterized by persistently elevated blood sugar levels. Using drugs to control blood sugar levels is currently the most commonly used treatment method in clinical practice. On this basis, active complication prevention measures must be taken to ensure the safety of patients <sup>[7]</sup>.

The average score in Appointment Keeping was between 4 and 5 points, indicating good transition readiness in that area. The mean score for Appointment Keeping was 4.09, with a standard deviation of 0.90. Patients were punctual in Appointment Keeping and could attend appointments as agreed. It was convenient for patients to see doctors and receive consultations, shortens the time required for medical treatment, reduces medical expenses, and improves patient satisfaction and quality of life <sup>[8]</sup>.

The average score in Tracking Health Issues was between 3 and 4, indicating areas where the individual

was learning or had started implementing the skills. The mean score for Tracking Health Issues was 3.84, with a standard deviation 1.09. Special attention should be paid to the patient's health problems and detected in time. Health was part of diabetes management. Early detection and relief of depression and anxiety in diabetic patients, helping them get rid of bad psychology and restore self-confidence as soon as possible, will not only help improve the quality of life of patients, but also help control diabetes and reduce the risk of diabetic complications<sup>[9]</sup>.

The average score in Talking with Providers was between 4 and 5 points, the highest level and the best control in this scale. This indicates good transition readiness in that area, indicating patients were more willing to communicate with professional medical staff and listen to them. The mean score for Talking with Providers was 4.50, with a standard deviation of 0.85. Patients' trust in medical institutions and staff is an important source of hope. Medical staff's good attitude and superb skills are conducive to improving patients' level of hope<sup>[10]</sup>.

The average score in Managing Daily Activities was between 4 and 5, indicating good transition readiness and that patients would change their daily activities after diagnosis to ensure their daily lives. The mean score for Managing Daily Activities was 4.31, with a standard deviation of 0.87. After being diagnosed with diabetes, the lifestyle of most individuals will also change. They will eat a reasonable diet, increase physical exercise, improve health awareness, and take the initiative to take reasonable drug treatments to control blood sugar levels, avoid further T2DM, and effectively prevent complications<sup>[11]</sup>.

The overall mean score was 4.16, with a standard deviation of 0.79. The overall level was between 4 and 5 points, and the Standard deviation is also within the range, showing the patient's self-care ability is relatively high. It shows that middle-aged people pay special attention to health after a certain age, and their self-care ability is also high. In addition, they also have a solid economic foundation. The study posits that diet, exercise, medical care use, self-care, and other regimens that affect blood sugar control in diabetic patients are of great significance to improving the quality of life of patients, which is consistent with the results of this study<sup>[12]</sup>.

### 3.2. Problem No. 2.

The level of self-management of the respondents in term of glucose management, dietary control, physical activity, health care use and overall score of mean level of self-management of the respondents (see **Table 2**).

**Table 2.** The respondents' level of self-management

| Category           | Mean score | SD   |
|--------------------|------------|------|
| Glucose management | 5.73       | 2.05 |
| Dietary control    | 5.15       | 2.18 |
| Physical activity  | 5.06       | 2.44 |
| Health-care use    | 5.53       | 2.31 |
| Overall            | 5.34       | 2.01 |

Notes: Scale score = Actual sum of items / maximum possible sum of items × 10. Thus, the transformed scale score can vary between 0 and 10. A score of 10 indicates the most effective self-care behavior. On the contrary, if the score is lower, it means that the ability to manage oneself is low and needs to be improved. Summing Items: The scores for all items (after any necessary reverse scoring) are added together. Transformation to 0–10 Scale: The total sum score is then transformed to a 0–10 scale. This is typically done by dividing the raw score by the maximum possible raw score for that scale and then multiplying by 10. Interpretation: A score of 10 on the transformed scale represents the highest possible rating of self-management behavior for that scale.



The average score for glucose management is 5.73, indicating that the level is the best for this item. The standard deviation is 2.05. Blood glucose monitoring is an important part of diabetes management. Regular blood glucose monitoring helps understand patients' diet, medication, and exercise regimens, allowing them to adjust their treatment plans promptly and improve treatment efficiency<sup>[13]</sup>. Health education is the foundation of type 2 diabetes patients' diet, exercise, medication, and blood glucose monitoring treatment. It helps patients improve their diabetes knowledge, health beliefs, and compliance with medical advice.

The average score of dietary control is 5.15, reaching half of the standard level. The standard deviation is 2.15. This shows that although patients need to control their diet in their daily diet, it is often difficult. Weight management also has an improving effect on metabolic-related indicators of diabetic patients, such as blood pressure and blood lipids. Studies have confirmed that dietary control is one of the factors that are favorable for reasonable diabetes control. It helps patients discover the law of their blood glucose changes, but also helps doctors adjust the patient's medication dosage, which is more conducive to blood glucose control. The better the diet control of T2DM patients is, the more likely they are to strictly follow the doctor's instructions and pay more attention to scientific nutrition matching and reasonable diet methods, which can not only improve human metabolic indicators such as blood sugar, glycosylated hemoglobin, and blood lipids, but also enhance the body's resistance, thereby promoting their confidence and ability to manage their own health status to be relatively high<sup>[10]</sup>.

In physical activity, the average score reached 5.06 points, indicating that exercise is challenging for diabetic patients and requires long-term persistence. The standard deviation is 2.44. Reasonable exercise training is beneficial for controlling blood sugar in diabetic patients<sup>[14]</sup>. Exercise can regulate blood sugar, improve insulin resistance, and effectively prevent type 2 diabetes. According to the body's needs, using various sports methods to develop the body in a planned and regular manner to promote health can have a specific therapeutic effect on diabetes<sup>[15]</sup>.

The average score of health-care use is 5.53, reaching a medium level, but improvement is still needed. The standard deviation is 2.31. Medical insurance, which provides financial security for disease treatment, may reduce patients' financial pressure, increase their enthusiasm for medical treatment, and, to a certain extent, rebuild their confidence in overcoming the disease and maintaining hope<sup>[3]</sup>. In terms of physical health, exercise is an important intervention for preventing and controlling type 2 diabetes. Experts have recognized exercise as an important healthcare measure, and based on this, they have proposed integrating sports into active health plans<sup>[16]</sup>.

The overall mean score is 5.34, with a standard deviation of 2.01. Comprehensive diabetes treatment includes diabetes education, blood sugar monitoring, diet, and exercise therapy. In recent years, numerous studies have demonstrated that, in addition to medication, non-drug treatments such as health education, diet therapy, and exercise therapy can effectively lower blood sugar levels in patients with type 2 diabetes. Numerous domestic and international studies have demonstrated that non-drug interventions can effectively improve patients' quality of life, promote physical and mental well-being, reduce complications, and even prevent the disease in its early stages, thereby enhancing the effectiveness of diabetes treatment<sup>[16]</sup>. Studies both domestically and internationally have shown that non-drug interventions, such as a low-fat diet and exercise, can delay and control the progression of diabetes and are effective methods for preventing or delaying type 2 diabetes. They can also reduce treatment costs, achieving a favorable cost-effectiveness ratio.

The American Association for Physical Education and Sports, in its 2022 "Exercise/Physical Activity Guidelines for Patients with Type 2 Diabetes", states that regular exercise can improve insulin sensitivity, lower blood sugar, blood pressure, and blood lipids, and also improve strength, bone density, and skeletal muscle mass

in patients with type 2 diabetes. Therefore, appropriate exercise is considered a top priority for preventing type 2 diabetes, and aerobic exercise is currently recognized as the best method for preventing and controlling diabetes.

### 3.3. Problem No. 3.

Is there a significant relationship between the respondents' readiness for independent self-care and self-management? **Table 3** shows the relationship between the readiness for independent self-care and self-management of the respondents.

**Table 3.** The relationship between the respondents' readiness for independent self-care and self-management, with the use of Spearman's rho correlation coefficient

| Variables       | Mean | SD   | Spearman rho | Interpretation   | p-value | Interpretation | Decision               |
|-----------------|------|------|--------------|------------------|---------|----------------|------------------------|
| Readiness       | 4.16 | 0.79 | 0.28         | Weak correlation | 0.005   | Significant    | Reject null hypothesis |
| Self-management | 5.34 | 2.01 |              |                  |         |                |                        |

The results revealed a Spearman rho value of 0.28, indicating a weak positive correlation between readiness and self-management. This suggests that as the level of readiness for independent self-care increases, the level of self-management among the respondents also tends to increase, albeit somewhat. A correlation coefficient greater than zero indicates a positive correlation, while a value less than zero indicates a negative correlation. Values near zero indicate a weak relationship between the two variables being compared. The correlation was statistically significant, with a p-value of 0.005 below the conventional significance threshold of 0.05. This means the likelihood of this relationship occurring by chance is very low. Based on this result, the null hypothesis, which posits that there is no significant relationship between readiness and self-management was rejected. In terms of descriptive statistics, the mean score for readiness was 4.16 with a standard deviation of 0.79, while the mean score for self-management was 5.34 with a standard deviation of 2.01. These findings indicate that the respondents generally reported moderate to high levels of readiness and self-management, with more variability noted in self-management scores. Overall, the findings suggest that readiness for independent self-care plays a statistically significant role in influencing self-management, although the strength of this relationship is relatively weak.

Independent self-care and diabetes self-management are long-term and systematic work that requires patients to manage their diabetes in their daily lives scientifically. Through reasonable diet management, scientific exercise planning, regular blood sugar monitoring, and rational medication, diabetic patients can effectively control blood sugar, delay or prevent complications, and thus improve their quality of life. Effective nursing intervention can significantly enhance the effectiveness of patients' self-management. In the future, with the continuous advancement of medical technology, the self-care and management methods of diabetes will become more diversified and intelligent. However, for patients, developing healthy living habits is still the foundation for controlling diabetes. In summary, self-care and self-management correlate in patients with type 2 diabetes.

Strengthening health education, mainly focusing on improving the level of self-care and self-management of patients, scientifically applying theories, designing and carrying out diabetes self-management health promotion projects, can improve the quality of clinical nursing and the quality of life of diabetic patients.

## **4. Summary of findings, conclusions and recommendations**

Based on the health behavior theory, this study carried out independent self-care and self-management health education for middle-aged patients with type 2 diabetes to improve the relevant behaviors of middle-aged patients and find the correlation between the two.

### **4.1. Summary of findings**

This study investigated the current status of middle-aged patients with type 2 diabetes in terms of autonomous self-care and self-management, as well as the correlation between the two. It was determined that there was a correlation between the two, although the strength of the relationship was relatively weak.

The study found that in diabetes self-care, patients were best prepared for transition in Talking with Providers, and were more willing to communicate with professional medical staff and listen to their opinions. This shows that they have a high degree of trust in medical staff and are more willing to listen to the advice of professionals. Regarding Tracking Health Issues, patients do not pay much attention to it and are likelier to ignore health problems. Studies have shown that patients have a relatively high self-care ability, which means that after middle-aged people reach a certain age, they pay special attention to their health and have a relatively high self-care ability. In addition, they have a solid economic foundation, so overall, their self-care ability was still excellent. Diet, exercise, medical care, self-care, and other health-preserving methods that affect blood sugar control in diabetic patients are of great significance to improving the quality of life of patients.

In diabetes self-management, patients have the best control over glucose management, but the worst control over physical activity. The study showed that after confirming diabetes, people pay more attention to their blood sugar. Blood sugar monitoring was one of the important means of diabetes management. It can effectively monitor changes in the disease and treatment effects to facilitate timely adjustment of treatment plans, thereby effectively delaying the occurrence and development of complications and enhancing confidence in defeating the disease. In terms of physical activity, middle-aged people were in a period of giving equal importance to family and career, and it was challenging to balance physical activity. Participating in and persisting in physical activity was the focus of blood sugar and overall health management for people with diabetes and prediabetes. The Diabetes Self-Management Questionnaire (DSMQ) survey found that the self-management ability of patients was not very high. Knowledge level has a significant direct impact on self-management behavior and an indirect impact on self-management behavior through behavior. The lack of health knowledge of diabetes affects patients' blood sugar control levels. Therefore, it is necessary to strengthen diabetes health education, improve awareness, and improve patients' attitudes towards diabetes to change self-management behavior.

Through the analysis of the survey results, it can be seen that patients with a high level of independent self-care have a high level of self-management; conversely, patients with a low level of independent self-care have a low level of self-management. This showed that there was a correlation between independent self-care and self-management. This suggests that as the level of readiness for independent self-care increases, the level of self-management among the respondents also increases.

### **4.2. Conclusion**

This study shows a positive correlation between self-care and self-management, demonstrating the research's significance. This research also suggests potential benefits for better blood sugar control in patients with type 2 diabetes and greater attention to their health. Patients with higher self-care and self-management scores reported

better blood sugar control. Through full-process research on patients with type 2 diabetes, continuous optimization and improvement in independent self-care and self-management practices will be carried out to provide a reference basis for formulating the next nursing plan for patients with type 2 diabetes, continuously improve the quality of care for patients with type 2 diabetes, and promote overall health. Therefore, developing courses related to self-care and self-management can improve people's progress in fighting diabetes, further improve blood sugar levels, keep patients' blood sugar within a reasonable range, improve patients' moods, and contribute to their physical health.

## Disclosure statement

The authors declare no conflict of interest.

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