Self-consistency and Self-care Among Older Adults With Type 2 Diabetes

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SELF-CONSISTENCY AND SELF-CARE AMONG OLDER ADULTS WITH TYPE 2 DIABETES

by

Jing Hu

A Dissertation

Submitted in Partial Fulfillment of the

Requirements for the Degree of

Doctor of Philosophy

Major: Nursing

The University of Memphis

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ABSTRACT

Evidence from previous studies showed that older adults with diabetes demonstrate low levels of self-care for managing their symptoms and blood glucose and have difficulty adhering to self-care behaviors for long periods of time. Since self-care is motivated by self-concept, the consistency of self-concept may help patients better cope with their health problems and form longstanding healthy behaviors.

The purposes of this study are to: (1) examine the relationship between self-consistency and self-care among older Chinese adults with type 2 diabetes; (2) examine the bi-variate relationships among depressive symptoms, self-consistency, and self-care among older Chinese adults with type 2 diabetes; (3) examine the bi-variate relationships among demographics, health measures, self-consistency, and self-care; and (4) identify the predictors of self-care among self-consistency, depressive symptoms, demographics, and health measures. This is a cross-sectional study of Chinese adults aged 60 years and older with type 2 diabetes in community healthcare centers in Shanghai. Demographic and health data were collected, in addition to data using established scales of self-care, self-consistency, and the geriatric depression. Pearson correlation and multivariate linear regression analyses were used to test the associations between the variables.

The sample of 195 older adults with type 2 diabetes were surveyed, and the average age was 71.6 years. The results of Pearson correlation analysis showed that: (1) Self-consistency did not directly correlate with the self-care of older adults with type 2 diabetes; (2) Self-consistency and self-care had a significantly negative correlation with depressive symptoms; (3) Self-consistency overall correlated with the number of comorbidities and SPH except age, gender, education level, marital status, income,
duration, HbA1c, BMI, or number of complications; (4) Self-care correlated with the number of complications, but did not correlate with age, gender, education level, marital status, income, duration, HbA1c, BMI, or number of comorbidities, or SPH; (5) The path analysis using multiple linear regression showed that stability of self-concept and depressive symptoms directly and negatively predicted self-care; duration directly and positively predicted self-care; self-knowledge, stability of self-concept, and SPH all directly and negatively predicted depressive symptoms; self-knowledge and SPH indirectly predicted self-care through depressive symptoms.

Future research could build structural equation models to further clarify the relationships among these variables, especially the relationship between self-consistency and self-care, with a larger sample size. Further, a longitudinal study is needed to determine changes in self-care over time and what may account for improvements or declines in self-care over the disease duration.

*Keywords:* older adult, type 2 diabetes, self-consistency, self-care
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CHAPTER 1: INTRODUCTION

Statement of the Problem

Diabetes is a global public health problem. According to the International Diabetes Federation (IDF), in 2019, there were about 463 million adults aged 20–79 diagnosed with diabetes globally (9.3% of the world’s population in this age group). This number is expected to reach 578 million by 2030 (Saeedi et al., 2019). There are approximately 116 million adults with diabetes in China (Liu, 2020). The prevalence rate has doubled since 1980, from 4.7% to 9.2%, making China the country with the largest number of people with diabetes in the world. It is estimated that there will be 140 million adults with diabetes in China by 2030 (Liu, 2020).

The incidence of diabetes increases with age (Sinclair et al., 2020). Therefore, the highest prevalence of diabetes is among the elderly over 65 years old. Worldwide, the number of people living with diabetes aged 65 to 99 was about 135.6 million in 2019, and it is expected to reach 195.2 million by 2030 and 276.2 million by 2045 (Sinclair et al., 2020). In China, there are 78.1 million adults 60 years and older with diabetes, and more than 95% have type 2 diabetes (Chinese Elderly Type 2 Diabetes Prevention and Treatment of Clinical Guidelines Writing Group et al., 2022). The accelerated increase in diabetes prevalence in aging societies is due to unhealthy obesogenic diets, reduced physical activity, and improved diagnostic rates for type 2 diabetes (Saeedi et al., 2019). This is similar to causes in younger adults, which further affect older adults in combination with the effects of the natural aging process, such as altered glucose metabolism, islet cell dysfunction, and even rising life expectancy (Saeedi et al., 2019). Due to the decline in physiological function, the incidence of complications increases in
older adults, and their quality of life is greatly affected (Chinese Elderly Type 2 Diabetes Prevention and Treatment of Clinical Guidelines Writing Group et al., 2022). According to the International Diabetes Federation, 4.2 million people aged 20–79 years died of diabetes in 2019, accounting for 11.3% of total deaths, and 53.8% were over 60 years old (Saeedi et al., 2020). During the 2020 novel coronavirus disease 2019 (COVID-19) pandemic, the mortality rate of patients with advanced age, diabetes, and poor glycemic control increased significantly (Bornstein et al., 2020).

Diabetes is a chronic lifelong disease that can lead to chronic damage and dysfunction of various tissues, especially the eyes, kidneys, heart, blood vessels, and nerves (“Diabetes and Cancer Epidemiology,” 2012). Among people with diabetes, 76.4% have at least one complication (Hu et al., 2015), with complications being the leading cause of death (An et al., 2015). Diabetes mellitus is one of the major risk factors for cardiovascular disease (CVD), blindness, kidney failure, and lower extremity amputation (Wong et al., 2013). In addition, diabetes increases the risk of cancer, cognitive impairment, tuberculosis, and depression (Riza et al., 2014; Roy & Lloyd, 2012). Although diabetes cannot be cured, rational drug use and blood sugar control can delay complications and improve quality of life.

The guidelines for prevention and treatment of type 2 diabetes in the elderly in China recommend that the key to successful diabetes control is good self-care behaviors, which are essential for preventing complications and improving patients’ quality of life (Chinese Elderly Type 2 Diabetes Prevention and Treatment of Clinical Guidelines Writing Group et al., 2022). Diabetes self-care aims to maintain optimal glycemic control through the management of medication regimens (taking the appropriate dose of
medication at the correct time), following a diabetes meal plan to account for glucose levels and choosing healthy foods, blood glucose monitoring, exercising regularly, and attending regular medical/educational assessment visits (McNally et al., 2010). Barlow et al. (2002) found that the quality of self-management of people with diabetes affects disease prognosis and patient quality of life. Moreover, the American Diabetes Association (2015) highlighted that diabetic elders need self-care to improve psychosocial/emotional well-being and delay diabetes complications. However, only 35% of patients 65 years and older could effectively control their blood glucose levels (Guo et al., 2014), which could indicate a lack of appropriate self-care for older adults living with diabetes.

Self-care consists of two sub-concepts: self and care. The self is described as the organized, consistent, conceptual entity composed of perceptions of the characteristics of ‘I’ or ‘me’ (Rogers, 1959). How people think about themselves directs their behavior (Roy & Andrew, 1991). The self is the sole motivational construct in self-care behaviors. From this perspective, the behavior of self-care needs to consider the effect of how people know themselves, their subjective feelings, experiences, attitudes, and beliefs, and their conceptions about the self (Roy & Andrew, 1991).

Lecky (1961) and Coombs and Snygg (1959) asserted that the basic principle of self is self-preservation, both stability of the self over time and consistency, unity, and organization of the self. Individuals have the ability to maintain coherence among various self-perceptions and to coordinate the relationship between self and experience (Wang, 1994). Therefore, most of the actions taken by individuals are consistent with their self-concepts. When the self is inconsistent, the individual will become unhappy and
dissatisfied, and the tension and disturbance within the individual will also increase, thereby affecting physical and mental health (Wang, 1994). Due to chronic disease, elderly diabetic patients must make corresponding adjustments and adaptations to their deteriorating conditions, and constantly adjust self-evaluation deviations and unreasonable expectations in the coexistence of the disease to achieve a state of self-consistency (Zhang et al., 2017).

For older adults with diabetes, how they maintain their own sense of self and their organization of self-consistency may affect how they manage their type 2 diabetes. The consistency of self-concept may help patients better cope with their health problems and form healthy behaviors. A lower sense of self-consistency has been associated with depressive symptoms. Older adults with a higher level of self-consistency cope better with physical and psychosocial problems than those with a lower sense of self-consistency (Zhan & Shen, 1994; Marsiske et al., 1998; Zhan, 2000). A study analyzing the influence of self-consistency on self-management among hospitalized diabetic patients showed a regression relationship between self-consistency and self-management (Cai, 2020). The participants’ self-consistency explained 2.6% of the total variation in their HbA1c values and 8.8% of the variation in their diabetes self-management scores. The hypothesis is that low levels of self-consistency would impede the completion of multiple diabetes-related self-care practices in older Chinese adults with type 2 diabetes. On the contrary, high levels of self-consistency can promote positive emotional responses and stimulate patients to integrate self-care behavior into daily life.

Previous studies have indicated strong negative correlation between self-consistency and depression in which higher scores of self-consistency, lower scores of
depressive symptoms, and strong correlations between depression and self-care. The
direct pathway between self-consistency and self-care needs to be explained and
implicated. However, there is limited literature examining the relationship between self-
consistency and self-care activities among older adults.

**Purpose of the Study**

The purpose of this cross-sectional study is to investigate the relationship between self-consistency and self-care in older Chinese adults (age 60 and older) with type 2 diabetes. The aims of the study are as follows:


2) Examine the bivariate relationships among depressive symptoms, self-consistency, and self-care among older Chinese adults with type 2 diabetes.

3) Examine the bivariate relationships among demographics, health measures, self-consistency, and self-care.

4) Identify the predictors of self-care among self-consistency, depressive symptoms, demographics, and health measures.

**Research Questions and Hypotheses**

To address the purpose of this study, five major research questions and related hypotheses are proposed.

1) What is the relationship between self-consistency and self-care among older Chinese adults with type 2 diabetes?

H1: Self-consistency has a significant positive relationship with active self-care behaviors in older Chinese adults with type 2 diabetes.
2) What are the bivariate relationships among depressive symptoms, self-consistency, and self-care among older Chinese adults with type 2 diabetes?

H2: Depressive symptoms have a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes.

3) What are the bivariate relationships among demographics (gender, age, education level, marital status, family monthly income), self-consistency, and self-care in older Chinese adults with type 2 diabetes?

H3a: Male will have significantly higher self-consistency than female older Chinese adults with type 2 diabetes.

H3b: Older Chinese female adults with type 2 diabetes will report significantly higher levels of self-care than older Chinese male adults with type 2 diabetes.

H3c: Age has a significant negative relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes.

H3d: Older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-consistency than those with less than a bachelor’s degree.

H3e: Older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-care than those with less than a bachelor’s degree.

H3f: Married older adults with type 2 diabetes report significantly higher levels of self-consistency and self-care than older adults with type 2 diabetes who are not married.
H3g: Family monthly income has a significant positive relationship with self-consistency and self-care in older adults with type 2 diabetes.

4) What are the bivariate relationships among health measures (duration of disease, hemoglobin A1c [HbA1c], body mass index [BMI], number of complications, number of comorbidities, self-perceived health), self-consistency, and self-care?

H4a: Duration of disease has a significant positive relationship with self-consistency and self-care in older adults with type 2 diabetes.

H4b: Participants with a normal BMI report a significantly higher level of self-consistency than those who have BMI’s outside of the normal range.

H4c: Participants with a normal BMI report a significantly higher level of self-care than those who have BMI’s outside of the normal range.

H4d: HbA1c has a significant negative relationship with self-consistency and self-care behaviors in older adults with type 2 diabetes.

H4e: The number of complications has a significant negative relationship with self-consistency and self-care behaviors in older adults with type 2 diabetes.

H4f: The number of comorbidities has a significant negative relationship with self-consistency and self-care behaviors in older adults with type 2 diabetes.

H4g: Self-perceived health has a significant positive relationship with self-consistency and self-care behaviors in older adults with type 2 diabetes.

5) What are the predictors of self-care among self-consistency, demographics (gender, age, education level, marital status, family per capita monthly income), health measures (course of disease, HbA1c, BMI, number of complications, number of
comorbidities, and self-perceived health), and depressive symptoms in older Chinese adults with type 2 diabetes?

H5: Self-consistency, duration of disease, HbA1c, self-perceived health, and depressive symptoms are significant predictors of self-care in older Chinese adults with type 2 diabetes.

**Significance of the Study**

In nursing practice, the primary concern for older adults with diabetes is to help them adhere to self-care behaviors to manage their blood glucose levels and prevent or address diabetes-related complications. This study examined the relationship between self-consistency and self-care among older Chinese adults with type 2 diabetes. The results may help inform nursing interventions that will help older diabetic persons reflect on their own strengths, minimize their social anxiety, and use positive views of themselves in support of better diabetes self-care activities.

For nursing research, the study of the relationship between self-consistency and self-care of older adults with diabetes has implications for knowledge development in nursing. First, it furthers the understanding of self-consistency in older adults with diabetes. Second, it provides empirical evidence of self-consistency among older Chinese adults with type 2 diabetes and whether self-care behaviors are influenced by self-cognition.

For nursing education, this study provides relevant knowledge of self-consistency among older Chinese adults with type 2 diabetes and their ability to manage their chronic conditions in the aging process. Self-consistency theory could help nursing students understand the role of self-cognition in self-care behaviors of older adults with diabetes,
or other chronic conditions, and learn about conceptual constructs of self-consistency and its relationships with human responses to illness and health.

**Definition of Terms**

**Self-consistency.** Self-consistency refers to a part of the personal self component that strives to maintain a consistent self-organization and thus avoid disequilibrium (Roy & Andrew, 1991).

**Self-care.** In Orem’s theory of self-care, self-care is defined as actions that a person takes on his or her own behalf in maintaining life, health, and well-being (Tzeng, 2020). Diabetes self-care includes managing medication regimens (taking the appropriate dose of medication at the correct time), following a diabetes meal plan to account for glucose levels, choosing healthy foods, blood glucose monitoring, exercising regularly, and attending regular medical/educational assessment visits to maintain optimal glycemic control (McNally et al., 2010).

**Depressive symptoms.** Depressive symptoms refer to a negative emotional response produced by internal or external environmental stimuli, which leads to emotional manifestations of anxiety, sadness, depression, and low happiness (Sui, 2022). Depressive symptoms differ from depression, and individuals who have depressive symptoms can restore psychological stability through self-adjustment and psychological defense.

**Demographics.** Demographics include gender, age, education level, marital status, and family monthly income. Gender is defined as male or female. Age is defined as the participant’s age in years, from their self-reported birth date to the interview date. Education level was defined as the highest level of education attained by the participants,
with choices including did not graduate from primary school or below, junior high school, high school, college degree, or higher. Marital status is categorized as married, never married, divorced, or widow/widower. Income is defined as per capita monthly household income, and was assessed by asking “What is your family monthly income?” and “How many people are there in your family?”

**Health Measures.** Health measures cover duration of disease, HbA1c, BMI, comorbidities, complications, and self-perceived health (SPH). Duration of disease is defined as the years from the diagnosis of type 2 diabetes to the interview date. HbA1c was assessed by asking, “What is your last HbA1c result?” BMI was calculated by self-reported height and weight. Comorbidities are defined by the total number of comorbidities participants have among cataracts, hypertension, arthritis, depression, asthma, coronary heart disease, hyperlipidemia, backache, cancer, stroke, osteoporosis, hearing impairment, and other self-reported diseases. Complications are defined by the total number of complications among cardiopathy, hypertension, stroke, lower extremity venous disease (diabetic foot), diabetic retinopathy, and diabetic nephropathy. SPH is included in one of the six groups of determinants of the active and healthy aging model proposed by the WHO. It is measured with a single item that asks, “Overall, you would say your health is . . .,” with five response options: very good, good, reasonable, poor, and very poor (Paul et al., 2012, p. 4).

**Limitations**

Self-consistency is influenced by cultural background (English & Chen, 2011). Most research on self-consistency is derived from Western culture including the developed Self-Consistency Scale (SCS, Zhan and Shen, 1994). The SCS was used in this
study. Translation of the English version of SCS to a Chinese version may compromise true meanings of SCS conceptual construct and subconstructs. Participants may interpret each question of the SCS in Chinese social and cultural contexts. Data analyses may be limited as a complex structural equation modeling may help examine predictive values and pathways of relevant concepts/items in the constructs of self-consistency, behaviors of self-care, depression symptoms, and other covariables. This study used non-probabilistic sampling which limits sample representativeness. The cross-sectional study has its limitation as compared to rigorousness of randomly controlled studies. As a result, the research results cannot be generalized.

**Assumptions**

The following assumptions were made for this study:

1) Older adults have difficulty managing their type 2 diabetes.

2) Older diabetic adults with a lower level of self-consistency have poor self-care behaviors.

3) Older adults with type 2 diabetes can provide information associated with their sense of self-consistency and self-care behaviors, which could help the researcher meet the purpose of this study.

**Summary**

Improving the self-care of patients with type 2 diabetes is an effective strategy to help them control their blood sugar levels and improve their general health. However, previous studies have shown that older diabetic adults with low self-care levels struggle to manage their symptoms and blood glucose, and often lack self-care behaviors for long periods of time, leading to complications (Cosansu & Erdogan, 2014; Koo et al., 2011).
Self-care is motivated by self-concept. The consistency of self-concept may help patients with type 2 diabetes better form healthy behaviors and better manage their disease.

According to Erikson’s theory of psychosocial development (Parke & Clarke-Stewart, 2010), due to the objectivity of the aging process, the psychological, physical, and health conditions of older adults are deteriorating, and they must make corresponding adjustments to aging related changes. Older adults should adapt themselves to changes in the external environment, achieve self-awareness and regulation, and self-integration to improve their level of self-consistency. Based on the above statements, it is necessary to investigate the level of self-consistency of older adults with type 2 diabetes and its relationship with self-care. To date, there are limited studies on self-consistency in this population. Therefore, this cross-sectional survey study aimed at providing evidence of the relationship between self-consistency and self-care.

Chapter 2 of this dissertation reviews the literature relevant to this study, including the self-care of older diabetic patients, factors related to diabetes self-care, and self-concept and self-consistency. It also provides a conceptual framework of the relationship between self-consistency and self-care, as well as their relationships with the confounding variables of demographics, health measures, and depressive symptoms. Chapter 3 describes the study design and methodology. Chapter 4 provides the results of the study, and Chapter 5 discusses the results and presents the conclusions and recommendations.
CHAPTER 2: LITERATURE REVIEW

This chapter describes the literature relevant to the proposed study, which investigates the relationships between self-consistency and self-care among older Chinese adults with type 2 diabetes. Four sections are included in the chapter: (1) self-care of older adults with diabetes, (2) factors related to diabetes self-care, (3) self-concept and self-consistency, and (4) the study’s conceptual framework.

Self-Care of Older Patients with Diabetes

Diabetes self-care includes adhering to medication regimens (taking the appropriate dose of medication at the correct time), following a diabetes meal plan to account for glucose levels, choosing healthy foods, blood glucose monitoring, exercising regularly, and attending regular medical/educational assessment visits (McNally et al., 2010) to maintain optimal glycemic control. Diabetes self-care behaviors have a positive effect on controlling blood glucose, improving quality of life, and improving clinical outcomes (Yang, 2017; Ausili et al., 2017). Patients with self-care ability have lower HbA1c levels, fasting blood glucose levels, BMI indexes, and a lower risk of complications (Steinsbekk et al., 2015; Chrvala et al., 2016). In a study on patients who participated in self-management training, the hospitalization rate dropped by 14%, with the number of hospitalizations and emergency treatments decreasing by 3 cases per 100 patients, and the medical expenditure was reduced by $830 (Strawbridge, 2017).

In China, the proportion of the older population is increasing annually. The prevalence of diabetes in older Chinese adults exceeds 20%, and there are a large number of potential patients with impaired glucose tolerance (Yang et al., 2010). With aging, insulin release changes, and the compensatory ability of β cells decreases, leading to
insulin resistance, which manifests as postprandial hyperglycemia in the elderly. Patients who have been diagnosed with type 2 diabetes before the age of 60 are more likely to have complications or comorbidities due to longer years of disease. However, older patients with diabetes are easily missed diagnosis because of unobvious acute symptoms (Wang et al., 2016). In terms of complications, elderly patients with diabetes have an increased risk of lower limb disease, retinopathy, myocardial infarction, and end-stage renal disease (Li et al., 2012). Therefore, prevention and treatment of type 2 diabetes in older adults is key to preventing or limiting complications that negatively impact on older adults’ health and quality of life. The treatment goals for older patients with diabetes are to reduce the disability and premature death caused by acute and chronic complications, improve quality of life, and increase life expectancy.

Studies have shown that with the implementation of self-care behaviors, patients’ health behaviors, health status, and health service utilization rates have all improved. Although the elderly may decline in their physical function and mental state as they age, their ability to learn health-related knowledge and control diseases does not decrease (Lorig et al., 2001). Weinger (2006) reported that compared with young people, older adults with type 2 diabetes achieved the same benefits through participating in self-management interventions, including a decrease in HbA1c over time, with more improvement than in younger adults. The engagement of elderly patients in self-care behaviors can lead to improvements in their quality of life, disease distress, and depressive symptoms (Weinger, 2006). Tang (2017) conducted a survey using a diabetes self-care scale on 200 older patients with diabetes in China. The results showed that 81% of the patients were at a moderate level of self-care and that only 1% of the patients were
able to achieve good levels. The scores of the six dimensions of self-care behavior from high to low were as follows: medication, regular exercise, treatment of high and low blood glucose, foot care, diet control, and blood glucose monitoring. Wei et al. (2019) investigated 240 older patients with diabetes in rural China. The survey showed that older rural patients were confident in checking their feet and doing some activities as required; however, the patients lacked confidence in monitoring blood glucose and adhering to a diabetic diet on special holidays and when experiencing anxiety. Among the various self-care activities, moderate exercise and foot care were the best performed, followed by diet adherence and medication adherence, with the worst being blood glucose monitoring, which is at a low level overall.

**Factors Related to Diabetes Self-Care**

Diabetes self-care is affected by many factors, which can be classified into four categories: demographic, disease, cognitive, and psychological factors.

**Demographic Factors**

**Gender.** There are significant differences in self-care behaviors between men and women (Sethares et al., 2017), with women performing significantly better than men. This may be because women receive more support from outside the family. Ma et al. (2019) investigated 269 patients with diabetes, and multivariate regression analysis showed that gender is an influencing factor in self-care. Women have more active self-care behaviors compared with men, which Ma et al. (2019) attributed to men’s social responsibilities and work pressure, which leads to insufficient attention to their own self-care for their diseases. However, some researchers have pointed out that female patients also have disadvantages in self-care behavior. Women have higher family responsibilities
but receive less family support, and they are more likely to place family needs above their own health needs (Lin & Quinn, 2018).

**Age.** The influence of age on the level of self-management is complex, and the conclusions vary based on various studies. Maneze et al. (2016) surveyed 275 adults 18 years of age and older with diabetes in Sydney. Elderly patients (over 60 years old) with diabetes had lower health literacy than younger patients but performed better in self-management behaviors. As people age, they may pay more attention to health, which leads to good self-care behaviors. Li (2018) believed that the factor of age is distributed in a dumbbell shape. Young and middle-aged patients are too busy to pay attention to their own health, so the level of self-care is usually low. While in the early stage of aging, patients can show a positive attitude toward self-care when they retire, and their children grow up. However, with the increase in age, physiological function declines, and more comorbidities may occur, with the self-care of patients often poor (Li, 2018; Zhang & Zhou, 2015).

A study of people over the age of 60 showed that there is a significant relationship between the age of diabetics and their knowledge level (Ming & Magarey, 2008). With an increase in age, the knowledge level of self-care behaviors decreased. The authors hypothesized that this may be due to the low average education level of the elderly. It is difficult for persons with low education levels to master the relevant knowledge of insulin treatment, leading to low levels (Zhang & Zhou, 2015).

**Education.** A study found that the health literacy score was significantly lower in patients with a primary school education level (Maneze et al., 2016). Patients with diabetes with higher education levels had higher medication adherence but lower blood
glucose monitoring scores (Eh et al., 2016). Qin et al. (2019) studied the diabetes management status and influencing factors of middle-aged and elderly patients with diabetes using data from the China Health and Retirement Longitudinal Study. In this study, 1,540 patients with diabetes in 28 provinces were analyzed, and the results showed that the blood glucose control level of patients who had never been educated in school was the worst (Qin et al., 2019). In the study, the patients with a junior high education level had the best level of blood glucose control. The authors thought that this may be due to the fact that the study measured blood glucose control using self-assessment, and the patients with lower education levels may lack awareness or understanding of certain indicators, leading to a gap between their perception and actual control status. Another possible explanation is that patients with higher education levels may be burdened by psychological stress related to the disease, have better understanding of their blood glucose status, or have higher expectations for blood glucose control standards, resulting in relatively poorer self-assessment of blood glucose control.

**Marital Status.** Studies have found that marital status also has an impact on self-care behaviors. Married patients have family members to remind them of their self-care activities, so that patients can better develop and maintain healthy behaviors. Zhang and Yin (2014) investigated the self-management behaviors of patients with diabetes, and the results showed that married patients had better self-management behaviors than unmarried and those with other marital statuses (e.g., widowed). Ma’s (2019) research also had similar results, with the self-management behavior of patients who were separated or divorced being worse than that of married people. The attentive care of
partners and support from family are important factors that affect self-management behavior.

**Income.** Whether patients have the ability and willingness to pay for medical expenses is one of the factors affecting patients’ medical treatment. However, whether income level affects diabetes self-care behavior remains controversial. A study showed that income level is negatively correlated with blood glucose monitoring, and high-income people may prefer to adopt other self-care methods rather than monitoring blood glucose (Malanda et al., 2012). However, Zhang et al. (2016) found that the self-care level of patients with a high family income is better than that of patients with a low income, and the possible difference is whether they can spend more money on health care. Similar results were shown in a study by Yang et al. (2013). The results of their study show that family income is positively correlated with insulin treatment compliance of patients with type 2 diabetes, and that the treatment compliance of patients who have public medical insurance is better than that of patients who self-pay for care (Yang, Li, & Guan, 2013).

**Disease Factors**

**Duration of Disease.** The influence of the disease duration on diabetes self-care behavior is controversial. Research has shown that the longer the duration of disease in patients with diabetes, the higher the level of their adherence to medication because patients are accustomed to treatment options (Yue et al., 2015). A study conducted in China analyzed the outpatient data of 198 patients with diabetes, and the results showed that the scores of self-care behaviors, hypoglycemia management, and foot care for patients with a duration of less than 1 year were lower than those of patients with a longer
duration (1–5 years group, 6–10 years group, and >10 years group) (Jia et al., 2005).
However, Maneze et al. (2016) revealed that patients with diabetes who have been diagnosed for more than 10 years have more comorbidities (more than 2), lower confidence in treatment, and fewer self-care behaviors. Therefore, patients with shorter disease duration need nurses to provide self-care-related knowledge and skills in the early stages of the disease to enable them to form their self-care behaviors, while patients with longer disease duration also need to adjust the management plan in a timely manner according to their own health status. Therefore, regardless of the disease duration, all patients need to adjust their disease management strategies and adhere to their self-care behaviors.

**Complications and Comorbidities.** Generally, other diseases of patients with diabetes are divided into complications or comorbidities according to causality or etiology. Complications (such as cardiovascular disease, metabolic disease, and kidney disease) have the same pathophysiological characteristics and nursing care strategies for type 2 diabetes. Diseases such as asthma, cancer, and mental diseases (such as depression) have different pathophysiological characteristics or nursing care strategies from diabetes, so they are called comorbidities. Some studies have shown that patients with hypertension, obesity, and dyslipidemia (complications) exhibit better diabetes self-care behavior than patients with other comorbidities. Patients with complications may pay more attention to disease management due to their own health concerns, and the self-care behaviors of these diseases are similar. Some comorbidities may have conflicting care requirements, such as the limitation of exercise ability for respiratory failure, which leads to the failure to meet the needs of moderate exercise in patients with diabetes. In a
A retrospective study of 1900 patients with diabetes, 40% of respondents had at least one microvascular complication, 79% had at least one macrovascular complication, and 61% had at least one non-diabetes-related complication (Kerr et al., 2007). The results showed that patients with more complications paid less attention to diabetes, and the score for diabetes self-management ability was poor (Kerr et al., 2007). Patients who are dealing with complications related to diabetes may experience physical discomfort or fatigue, which can make it challenging to stay motivated to manage their condition. Additionally, these individuals may need more medical attention for their underlying health issues, which can take up their time and energy, leaving them with fewer resources to dedicate to managing their diabetes. A study in China also demonstrated that patients without complications have higher self-care abilities (Wang & Zhang, 2012). The reason may be that patients with strong self-care ability and high awareness of health care are more likely to seek medical resources to solve the disease problem, thus reducing the incidence of complications.

**Cognitive Factors**

**Self-efficacy.** Self-efficacy is an important factor that prompts patients to adopt correct self-care behaviors. A study by Liu et al. (2019) found that self-efficacy is positively correlated with self-care in empty-nest elderly patients with type 2 diabetes. Patients with low self-efficacy are more likely to lose their motivation and confidence in self-care, while patients with high self-efficacy are more confident in overcoming difficulties and remaining consistent in the diabetes self-care process. Sarkar et al. (2006) conducted an intervention study in patients with type 2 diabetes of different ethnic groups. For those in the study receiving the intervention, the self-efficacy score increased by 10%,
and patients had a better diet (an increase of 0.14 days per week), exercise (an increase of 0.09 days per week), blood glucose self-monitoring (odds ratio 1.16), and foot care. The effect of self-efficacy on self-care behavior was consistent across different ethnic groups.

**Self-Perceived Health.** Patients with diabetes report significantly poorer health when compared to the general population. Perceived poor health may lead to more active involvement in the health care behaviors of patients with diabetes. A study in Taiwan, which included 764 subjects aged 40 years or older with diabetes, examined the self-control behaviors of diabetics and associated factors (Chang et al., 2005). The results showed that self-perceived health is one of the factors associated with regular medication. Only 66% of patients with self-perceived good health reported regular medication compared with 78% with self-perceived fair health patients and 78% with self-perceived poor health. However, another study in Brazil reported opposite results (Borba et al., 2018). The study investigated 244 elderly patients with diabetes and found that the elderly who perceived their health as fair performed a greater routine of care with the disease in relation to those who self-assessed their health as poor.

**Psychological Factors**

Patients with diabetes are prone to depression, anxiety, and other negative emotions. These negative emotions not only reduce the patient’s quality of life but also affect the patient’s health outcome. Patients with type 2 diabetes have a high rate of psychological comorbidities. Studies have shown that about 28% of patients suffer from different severity levels of depression (Khaledi et al., 2019), and about 18% of patients suffer from anxiety (Chaturvedi et al., 2019). Schmitt et al. (2017) investigated the self-management behavior, depression symptoms, and blood glucose level of 430 patients,
and tested the relationship between depression symptoms, self-management behavior level, and HbAlc through structural equation modeling. The results showed that depressive symptoms were related to poor self-management behavior, while lower self-management behavior scores were related to higher HbAlc values. The authors believe that patients’ self-management behavior significantly mediates the relationship between depressive symptoms and HbAlc levels.

Regarding the different dimensions of patients’ self-management behavior, some studies have shown that severe depression is significantly related to patients’ exercise, diet, drug compliance, and other activities (Adam & Folds, 2014; Lin et al., 2004). For elderly patients with diabetes, depression symptoms will reduce the cognitive ability of elderly patients, thus affecting their level of diabetes self-management (Tomlin & Sinclair, 2016). Due to the differences in evaluation tools and survey populations used by different researchers, the influence of depressive symptoms on patients’ self-management behavior is controversial, and there are few studies on elderly patients.

**Self-Concept and Self-Consistency**

Self-concept is the internal motivational construct of self-care behaviors. Tiara et al. (2020) examined the relationship between self-concept and health locus of control on the quality of life of individuals with diabetes, and the findings indicated a significant effect of self-concept on the quality of life of patients with diabetes. However, the construct of self-concept varies among studies. The following literature review addresses the conceptual connotations of self-concept and self-consistency, self-concepts of people with diabetes, as well as the research on self-consistency in China.
Connotation of Self-Concept and Self-Consistency

Self-concept is regarded as a component of an individual’s affective and cognitive system (Markus & Wurf, 1987). Many investigators regard self-concept in the elderly as a unidimensional concept, such as self-esteem, self-efficacy, physical self-concept, and self-consistency (Amesberger et al., 2011; Demeyer et al., 2018; Hur, 2018; Zhan, 2000). Gaber used the Tennessee Self-Concept Scale to investigate the self-concept of older adults (Gaber, 1984), and factorial analysis showed that the components of aged self-concept included three dimensions: self-acceptance, doubt resolution/defensiveness, and conflict integration.

In Roy’s model of adaptation (Roy & Roberts, 1981), self-concept is one of four adaptive modes. The model addresses the self-system, which includes wholeness, subsystems, putting together of parts, inputs, outputs, and self-regulation and control. Roy (1981) noted that self-regulation and control functioned to keep the self-system in balance, and the major regulatory mechanism for self-concept may be self-consistency.

The theory of self-consistency was first proposed by Lecky (1945). Self-consistency refers to the sense that the elements of one’s self-concept cluster together in meaningful and mutually reinforcing ways (Elliott, 1986; Lecky, 1961; Zhan & Shen, 1994). It is a part of the personal self-component that strives to maintain a consistent self-organization and thus to avoid disequilibrium (Roy & Andrew, 1991). According to Lecky (1951), as new experiences are provided, a person’s fundamental concepts about the meaning of himself or herself and the world are continually being revised. People are motivated to behave in a way that is consistent with their understanding of the self or their self-concept. A lack of self-consistency may lead to certain affective disorders, such

Self-consistency is holistic, and Roy described it as a cognitive regulator to maintain one as who she or he is. People strive to make their existing self-concept consistent with behavior and understand themselves as stable and predictable, thereby maintaining intactness when facing potentially challenging situations, such as aging and disease. Zhan and Shen (1994) developed an instrument to measure self-consistency, which consists of two dimensions: self-knowledge refers to self-understanding and self-esteem; and stability of self-concept refers to private self-consciousness, stability of self-concept, and social anxiety. This scale was examined to have good reliability and validity (alpha coefficient $r = 0.89$). It could be used to evaluate whether one has setbacks, challenges, illness, social isolation, or stressful life events, and, in the face of these challenges, whether one can maintain who he or she is. Therefore, it is suitable to use this scale to assess the self-perception of older adults when coping with chronic illnesses.

**Self-Concepts of People with Diabetes**

Self-concept is self-image; it involves perceptions, appearances, values, and self-perception beliefs that influence behavior. There is a relationship between the disease’s chronicity and the patient’s self-concept (Chew et al., 2016). Chronic diseases affect patients’ self-esteem because they interfere with their ability to perform their daily activities (Luyckx et al., 2016). Low self-esteem causes patients to feel more depressed and to withdraw from other people. Low self-esteem can also lead to depression, anxiety, or other negative moods, which may eventually lead to patients not coping with diseases positively. Psychological conditions, such as stress and depression, can aggravate the condition of patients with diabetes because there is a significant relationship between
depression and higher blood sugar levels. However, a recent study showed that 61% of patients with diabetes have a fair self-concept and that it is not affected by stress (Amelia et al., 2020).

**Research on Self-Consistency in China**

The need for self-consistency is less salient in East Asian cultures than in European and American cultures (Suh, 2002). Suh (2002) compared the identity consistency between U.S. and Korean college students and found that American students viewed themselves as more consistent than Korean students. Gage et al. (2015) also found that East Asian participants had significantly lower levels of overall self-consistency than British participants.

For Chinese studies involving self-consistency, most authors have cited Rogers’ (1959) definition of self-consistency: there is no self-conflict in one’s self-concept, that is, no internal self-coordination of self and experience (Rogers, 1959). Wang (1994) developed the self-consistency and congruence scale (SCCS) based on Roger’s theory. SCCS consists of three subscales: inconsistency between self and environment, self-flexibility, and self-stereotype. This scale has been widely used in China. Most studies that used the scale were conducted among teenagers and younger adults (e.g., Li et al., 2014; Liu & Zhang, 2013; Zhou et al., 2015) and examined the relationship between self-consistency and depression and subjective wellbeing among these groups. Some studies have also investigated self-consistency among older adults. Zhang et al. (2017) investigated the relationship between the meaning of life, resilience, and self-consistency among older adults in China. The results showed that the meaning of life can predict self-consistency, both directly and through the mediator of resilience. Another study
examined the relationship between self-consistency and well-being of left-behind seniors in rural areas (He & Liu, 2012), which showed that the level of self-consistency and well-being in this group is low and lower self-consistency is related to lower well-being. Cai (2020) examined the relationship between self-consistency and self-management of patients with diabetes. The results showed that self-consistency positively predicted self-care of hospitalized patients with diabetes.

**Conceptual Framework of Self-Consistency and Self-Care**

Self-consistency theory provides a conceptual framework for this study. The main purpose of this study is to investigate the relationship between self-consistency and self-care in older adults with type 2 diabetes, focusing on the analysis of the predictive effect of self-consistency on self-care. Self-consistency is the core concept of this research. The theory of self-consistency analyzes the reasons for dis-consistency and the possible mechanism of dis-consistency on physical and mental health. Some studies have further explored the possible relationship between self-consistency and coping. A sense of self-consistency as a cognitive appraisal may lead to coping with existing health problems and engaging in self-care activities or behaviors. According to self-consistency theory and related research results, the hypothesis that there is a correlation between self-consistency and self-care in older Chinese adults with type 2 diabetes is valid.

Based on the literature review, a conceptual framework of this proposed study was developed and is provided in Figure 1. The dependent variable is the self-care of older patients with type 2 diabetes, consisting of general diet, specific diet, exercise, blood sugar testing, foot care, and medications. The independent variable is self-consistency, which consists of self-knowledge and the stability of self-concept. The
literature showed that gender, age, occupation, education level, marital status, living mode, monthly family income, medical reimbursement method, complications, comorbidities, self-perceived health, some clinical measures, and depressive symptoms may be factors associated with self-care for diabetes; therefore, these variables will be regarded as confounding variables.

Figure 1. Conceptual Framework of Self-Care and Self-Consistency.
CHAPTER 3: THE METHODOLOGY

Research Design

This study used a cross-sectional research design (Offredy & Vickers, 2010). As the purpose of this research is to examine the relationship between self-consistency and self-care among older adults with type 2 diabetes, the data for these variables should be collected at one point in time or within a short time interval. Therefore, a cross-sectional design would be suitable based on the research questions. In addition, a cross-sectional design is more feasible, given its low cost and rapid turnaround.

Protection of Human Subjects

This study was approved by the Institutional Review Board (IRB) at the University of Memphis. A copy of the IRB approval letter is provided in Appendix A. The IRB addressed ethical issues that may arise during the study, including obtaining informed consent from the participants, protecting the anonymity and confidentiality of the participants, and preventing participants’ coercion, undue burden, and stress. To obtain informed consent from the participants, the researcher emphasized the voluntary nature of the investigation before the survey and answered all the participants’ questions about the study. In addition, the researcher explained to the participants how the research results would be presented and who would use the information.

To protect the anonymity and confidentiality of the participants, the researcher (or research assistant) explained the principle of confidentiality and emphasized that their name and identity would not be revealed under any circumstances as collected data were reported as a group data so no name could be identified, and that the surveys were anonymous. Lastly, participants were told that they could suspend or terminate their
participation in the study at any time, preventing participants’ coercion, undue burden, and stress. Moreover, some food, water, and comfortable chairs were offered to the participants, who also received a small gift (daily necessities) after completing the survey.

**Population and Sample**

**Sampling Method**

The study population was older adults with type 2 diabetes in Mainland China, and the accessible population was older adults with type 2 diabetes living in Shanghai. Two-stage sampling was used to select the participants for this study. First, four community healthcare centers in Shanghai were selected conveniently. Then, 50 elderly people who met the inclusion and exclusion criteria were conveniently selected from each community healthcare center. The participants were recruited in the community healthcare centers by issuing publicity brochures, presenting posters, and word of mouth. The elderly who expressed an interest in taking part in the study were given a study package that included the study information letter and participant consent forms. As part of the consent process, potential participants had the opportunity to ask questions about the study.

**Inclusion and Exclusion Criteria**

The specific inclusion criteria for the study were as follows: (1) older adults 60 years of age or older (this was determined by the average age of retirement in China as well as the WHO’s guidelines); (2) patients who were clinically diagnosed with type 2 diabetes more than 1 year prior to the study; (3) outpatients with type 2 diabetes who visit community healthcare centers; and (4) older adults with type 2 diabetes who have the ability to communicate orally and provide written informed consent (participants who
had questions of the survey could ask investigator orally) in the Chinese language. The exclusion criteria included patients who had moderate to serious cognitive impairment (e.g., dementia or Alzheimer’s).

**Sample Size**

This study used multiple linear regression as the main statistical analysis method. The sample size was calculated by G power 3.1 statistical software using an $R^2$ of 0.4 and a power of 0.8, and it was determined to be 160 participants. Considering possible attritions due to incomplete or invalid questionnaires, the sample size increased by 25% to 200 participants. 225 older people with type 2 diabetes participated in the study. Of these, 19 surveys were incomplete, with more than 20% of the questions left unfilled, and 11 surveys were deemed invalid, as the participant selected the same answer across one of the measures. 195 valid surveys were analyzed finally.

**Study Setting**

This study was conducted in four community healthcare centers in Shanghai. Community healthcare services refer to the health care activities provided by the local medical department to residents in a certain community, including disease prevention, medical treatment, rehabilitation, and health promotion. Some older patients with diabetes regularly visit community healthcare centers to see a doctor and get their medication. The four community centers chosen for this study are located in different towns of Shanghai. Each center served more than 20,000 residents. Letters of support from these centers are provided in Appendix B.
Data Collection

Given the large sample size required for the study, the lead investigator used research assistants to assist with data collection. The investigators (lead investigator and research assistants) went to the four community health centers for the formal survey, with participants recruited using publicity brochures, posters, and word of mouth. The investigators visited the centers before recruitment and communicated the sample inclusion criteria with the staff at these centers. Then those staff served as intermediaries for the investigator by distributing flyers of the study to patients with type 2 diabetes aged 60 or older. The study recruitment flyer is provided in Appendix C.

The investigator and/or research assistant met with potential participants who were interested in the study to review the study. If the potential subjects agreed to participate in the study, they were provided with the survey, which began with a statement of informed consent. The participants were provided with sufficient time to consider whether to participate in the study. After allowing the potential participant sufficient time to read the statement of informed consent, the investigator answered any additional questions. After obtaining the informed consent of the participants, the investigator or research assistant used a unified instruction guide to introduce the purpose of the study to the elderly and then allowed the participants to complete the survey. Participants who were able to read the questionnaire by themselves completed it by themselves. For those who could not read the questionnaire, the investigator or research assistant dictated the content of every item and recorded the answers. The study locations where the survey interviews took place were in the private rooms of community healthcare centers.
Measurements

The instruments used in the study include: (a) the Self-Consistency Scale (SCS; Zhan & Shen, 1994); (b) the Summary of Diabetes Self-Care Activities (Toobert et al., 2000; Wan et al., 2008); (c) Geriatric Depression Scale (GDS-15; Tang, 2013; Sheikh & Yesavage, 1986); (d) demographics: gender, age, education level, marital status, family monthly income; and (e) health measures: self-perceived health (SPH; Paul et al., 2012), the number of complications and comorbidities, duration of disease, HbA1c, and BMI.

To better grasp the data collection method and test the feasibility of the questionnaire, the researcher selected 10 older adults for a pilot survey before the formal survey. The researcher used a unified guide to introduce the purpose of the study to the elderly. After the participants completed the survey, they reported to the researcher any difficulties in understanding any questions or scales within the survey instrument. Minor modifications to the survey were made based on the pilot study. The final survey instrument is provided in Appendix D.

The Self-Consistency Scale

Zhan and Shen (1994) developed the SCS, an instrument to measure self-consistency, which consists of two dimensions: self-knowledge, which refers to self-understanding and self-esteem; and stability of self-concept, which refers to private self-consciousness, stability of self-concept, and social anxiety. There are 27 items of SCS, and each item is scored on an ordinal scale from 1 to 4, with 1 indicating “never,” 2 indicating “rarely,” 3 indicating “sometimes,” and 4 indicating “always.” The range of scores is 0 to 108. This scale was examined to have good reliability with an alpha coefficient of $r = 0.89$ for all items, and $r = 0.88$ and $r = 0.84$ for the self-knowledge
subscale and stability of self-concept subscale, respectively (Zhan & Shen, 1994). Convergent validity was evaluated by comparing the scores with a visual analog scale (VAS) (Folstein & Luria, 1973). The correlation analysis showed that there was a moderately strong positive correlation between the SCS and the VAS ($r = 0.60$, $P < 0.01$). There was a moderately strong negative correlation between the SCS and the GDS ($r = -0.57$, $P < 0.01$), indicating the scale has good divergent validity. The construct validity of the SCS was also evaluated by factor analysis. A two-factor solution accounted for 44% of the variance. Factor 1 reflected one’s understanding of self, containing 15 items; Factor 2 reflected the stability of one’s self-concept, containing 12 items (Zhan & Shen, 1994). The SCS could be used to evaluate whether one who has setbacks, challenges, illness, social isolation, or stressful life events can maintain who he or she is. In this study, this scale was translated into Chinese and then reviewed by the bilingual author and a bilingual researcher to discuss and modify inaccurate translations. Furthermore, modifications were made after translation based on a pilot survey with 10 older Chinese adults.

**Summary of Diabetes Self-Care Activities**

The Summary of Diabetes Self-care Activities (SDSCA) is one of the most widely used scales for accessing diabetes self-care internationally. The frequency of self-care activities of patients with diabetes within 7 days before the implementation will be self-reported. The revised SDSCA covers 5 items including diet, exercise, blood glucose measurement, foot examination, and smoking status, a total of 11 core items, and 14 other items, which can be used to evaluate some specific self-management issues (Toobert et al., 2000). The Chinese version of the SDSCA consists of 11 items and 6 dimensions.
(general diet, specific diet, exercise, blood sugar testing, foot care, and medications) (Wan et al., 2008). The score range for each item is 0 to 7 points, and the total score is 0 to 77 points; the higher the score, the higher the self-care level of patients with diabetes. The general Cronbach’s α was 0.62 to 0.84, and the reliability coefficient was 0.83 (Li et al., 2011; Wan et al., 2008). The scale is easy to conduct due to fewer items and shorter time to complete, and it has good reliability and validity. Thus, it is widely used in communities and hospitals.

The Geriatric Depression Scale

The Geriatric Depression Scale (GDS), developed by Yesavage et al. (1982), is a self-rating screening tool that is widely used to measure the depressive symptoms of older adults all over the world. Sheikh and Yesavage (1986) designed a 15-item version based on the standard version of 30 items. Due to its shorter length and ease of administration, GDS-15 as a replacement for GDS has also been affirmed and widely used by clinical practitioners and researchers. Each item requires a dichotomous response (yes or no) that is scored as 1 or 0, and the total score is calculated by summing the responses that support depression. The range is 0 points (no depression) to 15 points (severe depression). A total score greater than 5 is classified as positive for depressive symptoms (Wang, 2014). The Cronbach’s α coefficient of the scale has been reported at 0.74 to 0.86 (Friedman et al., 2005; Van Marwijk et al., 1995), while the Chinese version was 0.793 (Tang, 2013). High correlations were noted between the GDS and other depressive symptom measures, which showed good criterion validity of the scale. In addition, the 15-item form is highly correlated with the original long form (Sheikh & Yesavage, 1986). The tool has a sensitivity of 81.3% and a specificity of 78.4% based on
the report of a meta-analysis (Van Marwijk et al., 1995). Due to these strengths (time-efficient, simplicity in scoring, and psychometric advantages), GDS-15 has been widely used to screen depressive symptoms among older Chinese adults.

**Demographics and Health Measures**

Demographics included gender, age, education level, marital status, and family monthly income. Gender was defined as male or female. Age was defined as the participant’s age in years, from their self-reported birth date to the interview date. Education level was defined as the highest level of education attained by the participants, with choices including did not graduate from primary school or below, junior high school, high school, college degree, or higher. Marital status was categorized as married, never married, divorced, widow, or widower. Income was defined as per capita monthly household income, and was assessed by asking “What is your family monthly income?” and “How many residents are there in your family?”

Health measures covered duration of disease, HbA1c, BMI, comorbidities, complications, and self-perceived health (SPH). Duration of disease was defined as the years from when they were diagnosed with type 2 diabetes to the interview date. HbA1c was assessed by asking, “What is your last HbA1c result?” BMI was calculated based on self-reported height and weight. Comorbidities were defined by the total number of comorbidities the participants had, including cataracts, hypertension, arthritis, depression, asthma, coronary heart disease, hyperlipidemia, backache, cancer, stroke, osteoporosis, hearing impairment, and other self-reported diseases. Complications were defined by the total number of complications the participants had, including cardiopathy, hypertension, stroke, lower extremity venous disease (diabetic foot), diabetic retinopathy, and diabetic
nephropathy. SPH was included in one of the six determinants of the active and healthy aging model proposed by the WHO. It was measured with a single item: “Overall, you would say your health is…,” with five response options: very good; good; reasonable; poor and very poor (Paul et al., 2012, p. 4).

**Data Analysis**

All data were analyzed using IBM SPSS 26.0 for Windows. A p value <0.05 is considered significant.

**Descriptive Statistics**

The demographic characteristics, clinical measures, and health status are described by means and standard deviations (age, monthly family income, HbA1c, BMI, number of complications, number of comorbidities, and self-perceived health) or frequency and percentage (gender, education level, and marital status). The scores of the GDS, SCS, and SDSCA are described by means and standard deviation.

**Inferential Statistics**

The study hypotheses were tested using the following statistical methodologies, which are summarized in Table 1.

a) To test Hypothesis 1 (self-consistency has a significant positive relationship with self-care behavior in older Chinese adults with type 2 diabetes), Pearson’s correlation coefficient was used to assess whether there was a correlation between self-consistency and self-care.

b) To test Hypothesis 2 (depressive symptoms have a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes), Pearson’s correlation coefficient was used to assess whether
there was a correlation between depressive symptoms and self-consistency and between depressive symptoms and self-care.

c) To test Hypotheses 3a–3g, a one-way analysis of variance (ANOVA) or non-parametric test (Kruskal–Wallis test) was used to analyze whether there was a significant difference among older Chinese adults with type 2 diabetes based on different demographic characteristics in SCS and SDSCA. The homogeneity of variance test was used to determine whether to use an ANOVA or nonparametric test.

d) To test Hypotheses 4a–4g, Pearson’s correlation coefficient was used to assess whether there was a correlation between health measures, self-consistency, and self-care in older Chinese adults with type 2 diabetes.

e) To test Hypothesis 5 (self-consistency, duration of disease, HbA1c, self-perceived health, and depressive symptoms are significant predictors of self-care in older Chinese adults with type 2 diabetes), multivariate linear regression analyses were used to examine the predictor value of self-consistency, demographic measures, health measures, and depressive symptoms on self-care.

Data Management

Statistical software (IBM SPSS 23.0) was used for data entry, storage, and analysis. This software can ensure the independence, reliability, safety, and integrity of data, as well as reduce data redundancy, and therefore improve the efficiency of data management. All the collected data entered were reviewed for accuracy by the investigator and a research assistant. Only the research team members had access to the data in the process of data analysis and interpretation. These data were stored in
encrypted files on a computer with a security password for at least five years. The study data were not shared with anyone except the research team and individuals or organizations required to monitor this research, including the Institutional Review Board of the University of Memphis. Any reports or publications describing this study will be written without any identifying information.

Table 1

Study Variables and Data Analyses Plan

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level of Measurement</th>
<th>Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-consistency</td>
<td>Continuous scale</td>
<td>Pearson’s correlation</td>
</tr>
<tr>
<td>Self-care</td>
<td>Continuous scale</td>
<td>Pearson’s correlation</td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>Continuous scale</td>
<td>Pearson’s correlation</td>
</tr>
</tbody>
</table>

Demographics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Nominal scale</th>
<th>T-test or non-parametric test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Continuous scale</td>
<td>Pearson’s correlation</td>
</tr>
<tr>
<td>Education level</td>
<td>Ordinal scale</td>
<td>ANOVA or non-parametric test</td>
</tr>
<tr>
<td>Marital status</td>
<td>Nominal scale</td>
<td>ANOVA or non-parametric test</td>
</tr>
<tr>
<td>Family monthly income</td>
<td>Ordinal scale</td>
<td>ANOVA or non-parametric test</td>
</tr>
</tbody>
</table>

Health measures

| Duration of disease        | Continuous scale     | Pearson’s correlation       |
| HbA1c                      | Continuous scale     | Pearson’s correlation       |
| BMI                        | Ordinal scale        | ANOVA or non-parametric test|
| Number of complications    | Ratio scale          | Pearson’s correlation       |
| Number of comorbidities    | Ratio scale          | Pearson’s correlation       |
| Self-perceived health      | Interval scale       | Pearson’s correlation       |

Quality Control Plan

Quality control for the study was ensured using the following efforts:

1) Sent and collected the questionnaires on the spot of community centers to ensure the response rate and the integrity and effectiveness of the answers to the survey.

2) Trained research assistants. The goal of the training was to have the research assistants reach an understanding of how the survey must be conducted, how to
assure a representative sample, and how to answer questions and record information. All research assistants received the Collaborative Institutional Training Initiative (CITI) training in the Chinese language on human subjects’ work and the responsible conduct of research. These assistants were trained by the lead investigator on the informed consent process for this study, study eligibility of participants (inclusion/exclusion criteria), the procedures for data collection, and how to address questions participants may have while completing the survey. Research assistants conducted the study interviews after their completion of the training. The lead investigator maintained a record of all assistants and documentation of completion of all training required for assistance with the study. A simple training manual was provided, containing the important points during the survey so that the research assistants could review and refer to the information. This included the purpose of the study and the use of the research instruments.

3) Researchers independently distributed questionnaires. If the subjects had questions about the questionnaire, the researchers gave consistent explanations on the spot.

4) Used a sealed envelope for questionnaire return. The questionnaire was put into an envelope one by one and sealed with double-sided adhesive tape. The first page of the questionnaire was annotated with guidance, research purpose, significance, and informed consent. According to the principles of voluntary, anonymous, confidential, and informed consent, the subjects were asked to fill in the questionnaire, put it into the envelope, and submit it sealed. If someone did
not agree to participate in the survey, he/she put the blank questionnaire in an
envelope and returned it sealed.

5) Ensured that each participant completed the questionnaire within similar
timeframe to reduce bias.

6) Checked the completeness of the questionnaire one by one to eliminate
incomplete questionnaires.

7) Input questionnaire responses into the database software one by one and used
double-entry review to ensure accuracy.
CHAPTER 4: RESULTS

This chapter presents study sample characteristics and the results of data from analyses of the research hypotheses. The first section reports the demographics and health-related questions of the sample. It also presents the descriptive statistics of the SDSCA, SCS, and GDS-15. The second section reports the internal consistency reliability of the Chinese version of the SCS and its subscales, as well as the SDSCA and GDS-15. The third section presents a discussion of the normality of the data. Findings from the analyses of the research hypotheses are reported in the fourth section.

Description of the Sample

Two hundred twenty-five older people with type 2 diabetes participated in the study. Of these, 19 surveys were incomplete, with more than 20% of the questions left unfilled, and 11 surveys were deemed invalid, as the participant selected the same answer across one of the measures. One hundred and ninety-five valid surveys were analyzed.

The demographic characteristics and health-related questions of the sample are shown in Tables 2 and 3. The mean age of the participants was 71.6 ± 8.4 years. The mean monthly family income per person was 3962.0 ± 2542.0 CNY. The mean duration of type 2 diabetes was 10.2 ± 7.7 years. The mean HbA1c was 7.3 ± 1.5%. The mean numbers of complications and comorbidities were 2.0 ± 1.4 and 1.0 ± 0.9, respectively. The mean score for self-perceived health was 3.2 ± 0.64. For gender, 49.7% of the participants were male, and 50.3% were female. For education level, only 5.6% of participants had a college degree or higher. Most of them had junior high school education (41.0%) or high school education (28.2%). A majority of participants were married (82.1%). The rest were widows or widowers, apart from five who were divorced.
As the number of divorced participants was quite limited, marital status was re-categorized as married or not married (divorced, widow, or widower) for further analysis. Over half of the sample (53.8%) had a high level of BMI, and 43.6% of the participants had a normal level of BMI.

**Table 2**

*Demographic Characteristics of the Sample*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>195</td>
<td>71.6103</td>
<td>8.43</td>
</tr>
<tr>
<td>Monthly income per person</td>
<td>195</td>
<td>3961.9732</td>
<td>2542.04</td>
</tr>
<tr>
<td>Duration of disease</td>
<td>195</td>
<td>10.2000</td>
<td>7.72</td>
</tr>
<tr>
<td>HbA1c</td>
<td>195</td>
<td>7.2813</td>
<td>1.46</td>
</tr>
<tr>
<td>Number of complications</td>
<td>195</td>
<td>2.0154</td>
<td>1.35</td>
</tr>
<tr>
<td>Number of comorbidities</td>
<td>195</td>
<td>1.0462</td>
<td>.88</td>
</tr>
<tr>
<td>Self-perceived health</td>
<td>195</td>
<td>3.2359</td>
<td>.64</td>
</tr>
</tbody>
</table>

**Table 3**

*Demographic Characteristics of the Sample*

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Frequency</th>
<th>Percent (%)</th>
<th>Cumulative Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>97</td>
<td>49.7</td>
<td>49.7</td>
</tr>
<tr>
<td>Female</td>
<td>98</td>
<td>50.3</td>
<td>100.0</td>
</tr>
<tr>
<td>Education level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>25.1</td>
<td>25.1</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>41.0</td>
<td>66.2</td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>28.2</td>
<td>94.4</td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>5.6</td>
<td>100.0</td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>160</td>
<td>82.1</td>
<td>82.1</td>
</tr>
<tr>
<td>Divorced</td>
<td>5</td>
<td>2.6</td>
<td>84.6</td>
</tr>
<tr>
<td>Widow or widower</td>
<td>30</td>
<td>15.4</td>
<td>100.0</td>
</tr>
<tr>
<td>BMI level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low (&lt;18.5)</td>
<td>5</td>
<td>2.6</td>
<td>2.6</td>
</tr>
<tr>
<td>Normal (18.5–24)</td>
<td>85</td>
<td>43.6</td>
<td>46.2</td>
</tr>
<tr>
<td>High (≥24)</td>
<td>105</td>
<td>53.8</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Table 4 provides descriptive statistics for self-consistency, self-care, and depressive symptoms of the sample. The mean total score on the self-consistency scale
was 82.32 ± 9.32, with the self-knowledge subscale being 44.73 ± 7.55 and the stability of self-concept subscale being 37.61 ± 5.10. The mean total score for the summary of diabetes self-care activities was 38.67 ± 12.71. The lowest mean score among all subscales was foot care, and the highest was medication. The mean total score of the GDS-15 was 3.55 ± 3.47. In total, 23.1% of participants had a score of higher than five, which is classified as positive depressive symptoms.

Table 4

Descriptive Statistics for Study Instruments

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-consistency scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-knowledge (15 items, 15–60)</td>
<td>195</td>
<td>44.73</td>
<td>7.55</td>
</tr>
<tr>
<td>Stability of self-concept (12 items, 12–48)</td>
<td>195</td>
<td>37.61</td>
<td>5.10</td>
</tr>
<tr>
<td>SCS total (27 items, 27–108)</td>
<td>195</td>
<td>82.32</td>
<td>9.32</td>
</tr>
<tr>
<td>The summary of diabetes self-care Activities</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medication (1 item, 0–7)</td>
<td>195</td>
<td>6.46</td>
<td>1.59</td>
</tr>
<tr>
<td>General diet (2 items, 0–14)</td>
<td>195</td>
<td>10.87</td>
<td>4.13</td>
</tr>
<tr>
<td>Specific diet (2 items, 0–14)</td>
<td>195</td>
<td>6.79</td>
<td>2.50</td>
</tr>
<tr>
<td>Exercise (2 items, 0–14)</td>
<td>195</td>
<td>5.69</td>
<td>4.09</td>
</tr>
<tr>
<td>Blood sugar testing (2 items, 0–14)</td>
<td>195</td>
<td>4.99</td>
<td>4.51</td>
</tr>
<tr>
<td>Foot care (2 items, 0–14)</td>
<td>195</td>
<td>3.97</td>
<td>4.73</td>
</tr>
<tr>
<td>SDSCA total (11 items, 0–77)</td>
<td>195</td>
<td>38.67</td>
<td>12.71</td>
</tr>
<tr>
<td>The 15-item Geriatric Depression Scale</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDS total (15 items, 0–15)*</td>
<td>195</td>
<td>3.55</td>
<td>3.47</td>
</tr>
</tbody>
</table>

*23.1% (N = 45) scored >5.

Consistency Reliability of Research Instruments

As self-consistency was translated into Chinese and first used in the current study, internal consistency reliability was assessed for the overall index and the two subscales. The internal consistency of SDSCA and GDS-15 was also assessed for the current study population. The Cronbach’s alpha coefficients of all instruments are shown in Table 5.

The specific diet subscale of the SDSCA had a negative score (-1.07). Since this subscale
had quite low consistency, the researcher removed it from further analysis in this study, with analyses based on the other nine items for SDSCA. The medication subscale of the SDSCA has only one item, so the Cronbach’s alpha coefficients could not be calculated. Other instruments’ coefficients ranged from 0.67 to 0.97, which is comparable to the consistency reliability reported by the original author.

Table 5

*Internal Reliability Coefficients for Instruments*

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Number of items</th>
<th>Cronbach’s alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Study</td>
<td>Author</td>
</tr>
<tr>
<td>SCS (Zhan &amp; Shen, 1994)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-knowledge</td>
<td>15</td>
<td>0.85</td>
</tr>
<tr>
<td>Stability of self-concept</td>
<td>12</td>
<td>0.81</td>
</tr>
<tr>
<td>Overall index</td>
<td>27</td>
<td>0.81</td>
</tr>
<tr>
<td>SDSCA (Wan et al., 2008)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General diet</td>
<td>2</td>
<td>0.91</td>
</tr>
<tr>
<td>Specific diet</td>
<td>2</td>
<td>-1.07</td>
</tr>
<tr>
<td>Exercise</td>
<td>2</td>
<td>0.67</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>2</td>
<td>0.97</td>
</tr>
<tr>
<td>Foot care</td>
<td>2</td>
<td>0.89</td>
</tr>
<tr>
<td>Medication</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Overall index</td>
<td>11</td>
<td>0.75</td>
</tr>
<tr>
<td>GDS-15 (Tang, 2013)</td>
<td>15</td>
<td>0.85</td>
</tr>
</tbody>
</table>

**Normality Test for Data**

The Shapiro–Wilk test was used to test the normality of all subscales of the SCS and SDSCA. The results showed that only the SCS total and SDSCA total scores had a normal distribution (see Table 6). Therefore, parametric tests, including independent sample t-tests and one-way ANOVA, were used for further analysis of SCS and SDSCA total scale scores. Non-parametric tests, including the Mann–Whitney and Kruskal–Wallis tests, were used for the data analysis of all subscales.
Table 6

Test of Normality

<table>
<thead>
<tr>
<th></th>
<th>Shapiro–Wilk Statistic</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>.965</td>
<td>176</td>
<td>.000</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>.977</td>
<td>176</td>
<td>.005</td>
</tr>
<tr>
<td>SCS total</td>
<td>.985</td>
<td>176</td>
<td>.064</td>
</tr>
<tr>
<td>General diet</td>
<td>.742</td>
<td>176</td>
<td>.000</td>
</tr>
<tr>
<td>Exercise</td>
<td>.944</td>
<td>176</td>
<td>.000</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>.863</td>
<td>176</td>
<td>.000</td>
</tr>
<tr>
<td>Foot care</td>
<td>.781</td>
<td>176</td>
<td>.000</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>.990</td>
<td>176</td>
<td>.254</td>
</tr>
</tbody>
</table>

Findings of the Research Questions and Hypotheses

Research Question 1

The first research question is, “What is the relationship between self-consistency and self-care among older Chinese adults with type 2 diabetes?” Hypothesis 1 was developed to address the first research question. The researcher hypothesized that self-consistency has a significant positive relationship with self-care behaviors in older Chinese adults with type 2 diabetes. The results using Pearson’s correlation coefficient showed that there was no statistically significant relationship between self-consistency and self-care overall (Table 7). However, self-consistency and its subscale stability of the self-concept had a significant negative correlation with blood sugar testing (p <0.05). Stability of the self-concept also had a significant negative correlation with SDSCA total and foot care (p <0.01). The relationships between items of SCS and SDSCA were also analyzed by Pearson’s correlation coefficient. Table 8 showed that four items which belong to stability of self-concept subscale were significantly negative correlated to self-care. And three items which belong to self-knowledge subscale were significantly positive correlated to self-care.
### Table 7

**Correlations Between Self-Consistency and Self-Care**

<table>
<thead>
<tr>
<th></th>
<th>SCS self-knowledge</th>
<th>SCS stability of self-concept</th>
<th>SCS total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General diet</td>
<td>Pearson correlation</td>
<td>.144</td>
<td>-.131</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.052</td>
<td>.075</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation</td>
<td>.114</td>
<td>-.030</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.125</td>
<td>.686</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation</td>
<td>-.087</td>
<td>-.186*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.243</td>
<td>.011</td>
</tr>
<tr>
<td>foot care</td>
<td>Pearson correlation</td>
<td>.141</td>
<td>-.250**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.058</td>
<td>.001</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation</td>
<td>-.059</td>
<td>.010</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.427</td>
<td>.889</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation</td>
<td>.091</td>
<td>-.222**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>.224</td>
<td>.002</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).

### Table 8

**Correlations Between Items of Self-Consistency and Self-Care**

<table>
<thead>
<tr>
<th></th>
<th>SDSCA total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spend time thinking about what I am like (stability)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Think to myself about what I am like (stability)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Spend time thinking about who I am (stability)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Spend time thinking about what kind of person I am (stability)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Feel that I am a person of worth, at least on an equal with others (self-knowledge)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Understand who I am (self-knowledge)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Take a positive attitude toward myself (self-knowledge)</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed); **Correlation is significant at the 0.01 level (2-tailed).
Research Question 2 asked, “What are the bivariate relationships among depressive symptoms, self-consistency, and self-care among older Chinese adults with type 2 diabetes?” Pearson correlation analyses were used to examine the relationships between depressive symptoms and self-consistency, and between depressive symptoms and self-care. The second hypothesis is that depressive symptoms have a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes.

Table 9

Correlations Among Depressive Symptoms, Self-Consistency, and Self-Care

<table>
<thead>
<tr>
<th></th>
<th>GDS total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General diet</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Foot care</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Table 9 lists the results: depressive symptoms had a significant negative correlation with self-care and its subscale of exercise (p <0.01); the relationship between
depressive symptoms and self-consistency, as well as its two subscales (self-knowledge and stability of the self-concept), were also significant and negative (p <0.01).

**Research Question 3**

The third research question asked, “What are the bivariate relationships among demographics (gender, age, education level, marital status, and family monthly income), self-consistency, and self-care in Chinese older adults with type 2 diabetes?” Hypotheses 3a–g were developed to address this research question.

Hypothesis 3a states that males will have significantly higher self-consistency than females older Chinese adults with type 2 diabetes. Independent samples t-tests and Mann–Whitney tests were used to make comparisons between the means for male and female participants. As shown in Table 10, the difference in self-consistency and its subscales between male and female participants was not statistically significant.

**Table 10**

*Observed Gender Differences in Self-Consistency*

<table>
<thead>
<tr>
<th></th>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t/Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS total</td>
<td>Male</td>
<td>97</td>
<td>83.69</td>
<td>9.77</td>
<td>1.93</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>81.00</td>
<td>8.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS self-knowledge</td>
<td>Male</td>
<td>97</td>
<td>45.74</td>
<td>7.84</td>
<td>-1.77</td>
<td>0.08</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>43.74</td>
<td>7.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Male</td>
<td>97</td>
<td>37.99</td>
<td>5.01</td>
<td>-0.89</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>37.24</td>
<td>5.20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 3b states that older female adults with type 2 diabetes report significantly higher levels of self-care than older male adults in Chinese older adults with type 2 diabetes. Independent samples t-tests and Mann–Whitney tests were used to make comparisons between the means for male and female participants. As shown in Table 11,
the difference between male and female participants was significant only in the exercise subscale (p<0.05). Older male adults with type 2 diabetes reported significantly higher levels of exercise than older female adults.

Table 11

*Observed Gender Differences in Self-Care*

<table>
<thead>
<tr>
<th>Gender</th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>t/Z</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>General diet</td>
<td>Male</td>
<td>97</td>
<td>10.95</td>
<td>4.09</td>
<td>-0.43</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>10.80</td>
<td>4.19</td>
<td></td>
</tr>
<tr>
<td>Exercise</td>
<td>Male</td>
<td>97</td>
<td>6.39</td>
<td>4.24</td>
<td>-2.28</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>5.00</td>
<td>3.83</td>
<td></td>
</tr>
<tr>
<td>Blood sugar</td>
<td>Male</td>
<td>97</td>
<td>5.21</td>
<td>4.29</td>
<td>-1.35</td>
</tr>
<tr>
<td>testing</td>
<td>Female</td>
<td>98</td>
<td>4.78</td>
<td>4.73</td>
<td></td>
</tr>
<tr>
<td>Foot care</td>
<td>Male</td>
<td>97</td>
<td>4.16</td>
<td>4.95</td>
<td>-0.17</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>3.79</td>
<td>4.53</td>
<td></td>
</tr>
<tr>
<td>Medication</td>
<td>Male</td>
<td>97</td>
<td>6.53</td>
<td>1.39</td>
<td>-0.02</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>6.40</td>
<td>1.77</td>
<td></td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Male</td>
<td>97</td>
<td>33.03</td>
<td>12.28</td>
<td>1.30</td>
</tr>
<tr>
<td></td>
<td>Female</td>
<td>98</td>
<td>30.76</td>
<td>12.03</td>
<td></td>
</tr>
</tbody>
</table>

*Correlation is significant at the 0.05 level (2-tailed).*

Hypothesis 3c for the current study is that age has a significant negative relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes. Pearson correlation analyses were used to examine the relationships between age and self-consistency, and between age and self-care. Table 12 presents the results of all correlations for Hypothesis 3c. For self-consistency, age had a significant negative correlation with the self-knowledge subscale (p<0.05). The correlations between age and total self-consistency or the stability of self-concept subscale were not statistically significant. For self-care, age had a significant negative correlation with the exercise subscale (p<0.001). However, the correlation between age and the medication subscale
was significant and positive (p < 0.01), which is contrary to our hypothesis. There was no statistically significant relationship between age and the overall self-care scale.

**Table 12**

*Correlations Among Age, Self-Consistency, and Self-Care*

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>General diet</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>foot care</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 3d is that older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-consistency than those with less than a bachelor’s degree. Table 13 lists the results of the one-way ANOVA and Kruskal-Wallis tests showing that there are significant differences in self-knowledge of participants with different levels of education (p <0.01); however, there were no significant differences for the overall SCS scale. Multiple comparisons indicated that participants with a high school education level had a significantly higher level of self-
knowledge than primary school or below and junior high school. There were no significant differences between the college and other groups.

**Table 13**

*Education Level Differences in Self-Consistency*

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F/χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Primary school or below</td>
<td>49</td>
<td>42.62</td>
<td>7.22</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>80</td>
<td>43.79</td>
<td>7.21</td>
<td>12.47</td>
<td>0.006**</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>55</td>
<td>47.56</td>
<td>7.56</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College degree or higher</td>
<td>11</td>
<td>46.60</td>
<td>7.86</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Primary school or below</td>
<td>49</td>
<td>38.63</td>
<td>4.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>80</td>
<td>37.39</td>
<td>5.36</td>
<td>3.62</td>
<td>0.37</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>55</td>
<td>37.31</td>
<td>5.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College degree or higher</td>
<td>11</td>
<td>36.09</td>
<td>4.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SCS total</td>
<td>Primary school or below</td>
<td>49</td>
<td>81.25</td>
<td>7.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Junior high school</td>
<td>80</td>
<td>81.14</td>
<td>9.28</td>
<td>1.884</td>
<td>0.13</td>
</tr>
<tr>
<td></td>
<td>High school</td>
<td>55</td>
<td>84.88</td>
<td>10.35</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>College degree or higher</td>
<td>11</td>
<td>82.90</td>
<td>8.62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

** The mean difference is significant at the 0.01 level (2-tailed).

Hypothesis 3e is that older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-care than those with less than a bachelor’s degree. Table 14 lists the results of education-level differences in self-care. One-way ANOVA analysis shows that there were significant differences in SDSCA total (p < 0.05), but post-hoc using Tukey procedure did not reveal a significant difference between any two groups. The Kruskal–Wallis test showed that there were significant differences in the general diet (p <0.05) and exercise (p <0.01) subscales of the
participants with different levels of education. Multiple comparisons indicated that participants with primary school or below education level had a significantly lower level of exercise than junior high school and high school (p <0.05). However, for the general diet subscale, there was no significant difference between any two groups according to the multiple comparison analysis.

Table 14

*Education Level Differences in Self-Care*

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F/χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General diet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>10.49</td>
<td>4.44</td>
<td>8.12</td>
<td>0.044*</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>10.56</td>
<td>4.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>11.13</td>
<td>4.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>13.55</td>
<td>0.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>3.82</td>
<td>3.40</td>
<td>13.84</td>
<td>0.003**</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>6.23</td>
<td>4.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>6.20</td>
<td>4.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>7.55</td>
<td>5.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood sugar testing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>3.63</td>
<td>3.44</td>
<td>5.93</td>
<td>0.115</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>5.15</td>
<td>4.73</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>5.65</td>
<td>4.79</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>6.55</td>
<td>4.84</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Foot care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>3.45</td>
<td>4.44</td>
<td>0.32</td>
<td>0.956</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>4.16</td>
<td>4.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>4.22</td>
<td>5.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>3.60</td>
<td>4.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medication</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>6.61</td>
<td>1.43</td>
<td>4.80</td>
<td>0.187</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>6.24</td>
<td>1.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>6.55</td>
<td>1.36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>7.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SDSCA total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary school or below</td>
<td>49</td>
<td>28.00</td>
<td>11.04</td>
<td>3.04</td>
<td>0.030*</td>
</tr>
<tr>
<td>Junior high school</td>
<td>80</td>
<td>32.20</td>
<td>12.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High school</td>
<td>55</td>
<td>33.75</td>
<td>12.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td>College degree or higher</td>
<td>11</td>
<td>38.00</td>
<td>9.90</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The mean difference is significant at the 0.05 level (2-tailed); ** The mean difference is significant at the 0.01 level (2-tailed).
Hypothesis 3f states that married older adults with type 2 diabetes report significantly higher levels of self-consistency and self-care than those who are not married. As shown in Table 15, independent samples t-tests and Mann–Whitney tests were used to make comparisons between the means for married and other participants in self-consistency, self-care, and all subscales. For self-consistency, married participants reported significantly higher scores on the self-knowledge subscale than non-married participants (p < 0.01). On the contrary, non-married participants reported significantly higher on the stability of self-concept subscale than married participants (p < 0.05). For self-care, married participants reported significantly higher on the exercise subscale than non-married participants (p < 0.05). There were no statistically significant differences between marriage status on the overall SCS scale or on the overall SDSCA scale.

Table 15

<table>
<thead>
<tr>
<th>Marital Status Differences in Self-Consistency and Self-Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marital status</td>
</tr>
<tr>
<td>----------------------</td>
</tr>
<tr>
<td>SCS self-knowledge</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>SCS total</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>General diet</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>Blood sugar testing</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>Foot care</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>Medication</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
<tr>
<td>SDSCA total</td>
</tr>
<tr>
<td>Married</td>
</tr>
<tr>
<td>Not married</td>
</tr>
</tbody>
</table>
The mean difference is significant at the 0.05 level (2-tailed); ** The mean difference is significant at the 0.01 level (2-tailed).

Hypothesis 3g for the current study states that family monthly income per person has a significant positive relationship with self-consistency and self-care. Table 16 provides all the correlations between income and SCS (including subscales) and between income and SDSCA (including subscales). Monthly income per person had a significant positive correlation with self-knowledge (p <0.05) and a significant positive correlation with general diet (p <0.05) and exercise (p <0.01). However, there were no significant relationships between income and the overall SCS or SDSCA scales.

### Table 16

**Correlations Among Income, Self-Consistency, and Self-Care**

<table>
<thead>
<tr>
<th></th>
<th>Monthly income per person</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation .188*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .016</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation -.090</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .248</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation .103</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .197</td>
</tr>
<tr>
<td>General diet</td>
<td>Pearson correlation .154*</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .043</td>
</tr>
<tr>
<td>Specific diet</td>
<td>Pearson correlation -.093</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .223</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation .234**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .002</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation .064</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .402</td>
</tr>
<tr>
<td>foot care</td>
<td>Pearson correlation -.005</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .951</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation .038</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .618</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation .128</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .094</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).
Research Question 4

The fourth research question asked, “What are the bivariate relationships among health measures (duration of disease, hemoglobin A1c [HbA1c], body mass index [BMI], number of complications, number of comorbidities, self-perceived health), self-consistency, and self-care?” Hypotheses 4a–g were developed to address this research question.

Table 17

<table>
<thead>
<tr>
<th>Correlations Among Disease Duration, Self-Consistency, and Self-Care</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disease duration</td>
</tr>
<tr>
<td>General diet: Pearson correlation 0.197** Sig. (2-tailed) 0.06</td>
</tr>
<tr>
<td>Specific diet: Pearson correlation -0.021 Sig. (2-tailed) 0.773</td>
</tr>
<tr>
<td>Exercise: Pearson correlation -0.211** Sig. (2-tailed) 0.003</td>
</tr>
<tr>
<td>Blood sugar testing: Pearson correlation 0.107 Sig. (2-tailed) 0.138</td>
</tr>
<tr>
<td>foot care: Pearson correlation 0.211** Sig. (2-tailed) 0.003</td>
</tr>
<tr>
<td>Medication: Pearson correlation 0.207** Sig. (2-tailed) 0.004</td>
</tr>
<tr>
<td>SDSCA total: Pearson correlation 0.128 Sig. (2-tailed) 0.076</td>
</tr>
<tr>
<td>SCS self-knowledge: Pearson correlation -0.005 Sig. (2-tailed) 0.951</td>
</tr>
<tr>
<td>SCS stability of self-concept: Pearson correlation 0.034 Sig. (2-tailed) 0.648</td>
</tr>
<tr>
<td>SCS total: Pearson correlation 0.021 Sig. (2-tailed) 0.785</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Hypothesis 4a states that the duration of disease has a significant positive relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes. Table 17 shows all the correlation results, which indicate that a longer duration
of type 2 diabetes is significantly and positively correlated with a higher level for the four subscales of self-care, including general diet, exercise, foot care, and medication. However, the duration of disease did not significantly correlate with self-consistency, any of its subscales, or the overall SDSCA scale.

Hypothesis 4b is that participants with a normal BMI report a significantly higher level of self-consistency than those who have BMI’s outside of the normal range. A one-way ANOVA was used to examine whether participants with three different levels (low, normal, and high) of BMI differed significantly in self-consistency. The results revealed that there was no statistically significant difference among the three groups (see Table 18). This result supports Hypothesis 4b.

Table 18

<table>
<thead>
<tr>
<th>BMI Differences in Self-Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>SCS total</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>SCS self-knowledge</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>High</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
</tr>
<tr>
<td>Low</td>
</tr>
<tr>
<td>Normal</td>
</tr>
<tr>
<td>High</td>
</tr>
</tbody>
</table>

Hypothesis 4c is that older adults with type 2 diabetes with a normal BMI report a significantly higher levels of self-care than those with BMI’s outside of the normal range. However, as shown in Table 19, the results of the one-way ANOVA showed that participants with three different levels of BMI (low, normal, and high) did not differ significantly in self-care.
Table 19

**BMI Differences in Self-Care**

<table>
<thead>
<tr>
<th></th>
<th>N</th>
<th>Mean</th>
<th>Std. Deviation</th>
<th>F/χ²</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General diet</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>13.60</td>
<td>0.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>10.36</td>
<td>4.68</td>
<td>3.24</td>
<td>0.198</td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>11.15</td>
<td>3.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Exercise</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>2.40</td>
<td>3.36</td>
<td>3.73</td>
<td>0.152</td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>5.65</td>
<td>4.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>5.88</td>
<td>4.02</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Blood sugar testing</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>5.60</td>
<td>5.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>4.99</td>
<td>4.30</td>
<td>0.27</td>
<td>0.874</td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>4.96</td>
<td>4.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Foot care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>4.40</td>
<td>5.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>3.81</td>
<td>4.56</td>
<td>0.09</td>
<td>0.956</td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>4.08</td>
<td>4.89</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Medication</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>7.00</td>
<td>0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>6.48</td>
<td>1.63</td>
<td>1.28</td>
<td>0.527</td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>6.42</td>
<td>1.60</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SDSCA total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>5</td>
<td>33.00</td>
<td>8.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Normal</td>
<td>85</td>
<td>31.18</td>
<td>12.90</td>
<td>0.25</td>
<td>0.781</td>
</tr>
<tr>
<td>High</td>
<td>105</td>
<td>32.38</td>
<td>11.79</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Hypothesis 4d states that HbA1c has a significant negative relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes. However, the results of the Pearson correlation analyses did not support this hypothesis. Table 20 shows that there were no significant relationships between HbA1c and SCS (including subscales) or between HbA1c and SDSCA (including subscales).

Hypothesis 4e states that the number of complications has a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Table 21 lists the results of all the correlations for Hypothesis 4e. For self-consistency, the number of complications had a significant negative correlation with the self-knowledge subscale (p <0.05). However, the correlations to self-consistency overall and to stability of self-concept subscale were not statistically significant. For self-
care, the number of complications was significantly negatively correlated with self-care overall (p < 0.05) and the exercise subscale (p < 0.001).

**Table 20**

*Correlations Among Hba1c, Self-Consistency, and Self-Care*

<table>
<thead>
<tr>
<th></th>
<th>Hba1c</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation</td>
<td>-.040</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation</td>
<td>-.086</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation</td>
<td>-.087</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>General diet</td>
<td>Pearson correlation</td>
<td>-.004</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation</td>
<td>.030</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation</td>
<td>.121</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Foot care</td>
<td>Pearson correlation</td>
<td>-.031</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation</td>
<td>.029</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation</td>
<td>.046</td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

**Table 21**

*Correlations Among Numbers of Complications, SCS, and SDSCA*

<table>
<thead>
<tr>
<th></th>
<th>Number of complications</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation</td>
<td>-176*</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation</td>
<td>-.007</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation</td>
<td>-.138</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>General diet</td>
<td>Pearson correlation</td>
<td>-.096</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Specific diet</td>
<td>Pearson correlation</td>
<td>-.020</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation</td>
<td>-.335**</td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>
Table 21 continued

<table>
<thead>
<tr>
<th>Number of complications</th>
<th>Blood sugar testing</th>
<th>Pearson correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Foot care</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Medication</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>SDSCA total</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).

Table 22

*Correlations Among Comorbidities, Self-Consistency, and Self-Care*

<table>
<thead>
<tr>
<th>Number of comorbidities</th>
<th>SCS self-knowledge</th>
<th>Pearson correlation</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SCS stability of self-concept</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>SCS total</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>General diet</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Specific diet</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Exercise</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Blood sugar testing</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Foot care</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>Medication</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
<td>SDSCA total</td>
<td>Pearson correlation</td>
<td>Sig. (2-tailed)</td>
</tr>
</tbody>
</table>

* Correlation is significant at the 0.05 level (2-tailed); ** Correlation is significant at the 0.01 level (2-tailed).
Hypothesis 4f is that the number of comorbidities has a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Table 22 lists the results of all the correlations for Hypothesis 4f. For self-consistency, the number of comorbidities had a significant negative correlation with the self-knowledge subscale and self-consistency overall (p < 0.05). However, the correlation between the number of comorbidities and the stability of self-concept subscale was not statistically significant. For self-care, the number of comorbidities had a significant negative correlation only to the exercise subscale (p < 0.001).

**Table 23**

*Correlations Among SPH, Self-Consistency, and Self-Care*

<table>
<thead>
<tr>
<th></th>
<th>Self-perceived health</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCS self-knowledge</td>
<td>Pearson correlation .273**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .000</td>
</tr>
<tr>
<td>SCS stability of self-concept</td>
<td>Pearson correlation .104</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .159</td>
</tr>
<tr>
<td>SCS total</td>
<td>Pearson correlation .271**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .000</td>
</tr>
<tr>
<td>General diet</td>
<td>Pearson correlation -.045</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .531</td>
</tr>
<tr>
<td>Exercise</td>
<td>Pearson correlation .334**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .000</td>
</tr>
<tr>
<td>Blood sugar testing</td>
<td>Pearson correlation -.048</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .508</td>
</tr>
<tr>
<td>Foot care</td>
<td>Pearson correlation .073</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .315</td>
</tr>
<tr>
<td>Medication</td>
<td>Pearson correlation -.096</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .181</td>
</tr>
<tr>
<td>SDSCA total</td>
<td>Pearson correlation .091</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed) .210</td>
</tr>
</tbody>
</table>

**Correlation is significant at the 0.01 level (2-tailed).**

Hypothesis 4g is the last hypothesis for research question 4. It states that self-perceived health has a significant positive relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Table 23 lists the correlations.
between SPH and self-consistency, as well as between SPH and self-care. SPH had a significant positive correlation with SCS overall and to the self-knowledge subscale (p <0.001). In addition, SPH was significantly positively correlated with the exercise subscale of SDSCA (p <0.001). However, the overall correlation with SDSCA was not significant.

**Research Question 5**

The fifth research question asked, “What are the predictors of self-care among self-consistency, demographics (gender, age, education level, marital status, family per capita monthly income), health measures (course of disease, HbA1c, BMI, number of complications, number of comorbidities, self-perceived health), and depressive symptoms?” Hypothesis 5 stated that self-consistency, duration of disease, HbA1c, self-perceived health, and depressive symptoms are significant predictors of self-care in older Chinese adults with type 2 diabetes. A pathway analysis using multiple linear regressions (MLR) was conducted to determine the causal relationships among these variables.

Firstly, regression analysis is carried out with self-care as the dependent variable and the two dimensions of self-consistency (self-knowledge and stability of self-concept), depressive symptoms, demographics and health measures as the independent variables. Table 24 showed that disease duration, stability of self-concept, and depressive symptoms were significant predictors (p <0.05) with standardized coefficients of 0.209, -0.231, and -0.225 respectively. The R² of 0.140 indicates that 14.0% variance in self-care behaviors is a function of this model.
Table 24

Model of the MLR for Self-Care

<table>
<thead>
<tr>
<th>Model</th>
<th>b</th>
<th>SE</th>
<th>β</th>
<th>p</th>
<th>R²</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>33.846</td>
<td>21.826</td>
<td>.123</td>
<td></td>
<td>.193</td>
</tr>
<tr>
<td>Age</td>
<td>.146</td>
<td>.144</td>
<td>.096</td>
<td>.313</td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td>-.338</td>
<td>2.215</td>
<td>-.013</td>
<td>.879</td>
<td></td>
</tr>
<tr>
<td>Education level</td>
<td>1.980</td>
<td>1.472</td>
<td>.122</td>
<td>.181</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td>.966</td>
<td>3.079</td>
<td>.028</td>
<td>.754</td>
<td></td>
</tr>
<tr>
<td>Monthly income per person</td>
<td>.000</td>
<td>.000</td>
<td>.056</td>
<td>.512</td>
<td></td>
</tr>
<tr>
<td>Duration of disease</td>
<td>.354</td>
<td>.144</td>
<td>.209</td>
<td>.015*</td>
<td></td>
</tr>
<tr>
<td>BMI level</td>
<td>.384</td>
<td>.356</td>
<td>.089</td>
<td>.283</td>
<td>0.193</td>
</tr>
<tr>
<td>Hba1c</td>
<td>.659</td>
<td>.706</td>
<td>.075</td>
<td>.352</td>
<td></td>
</tr>
<tr>
<td>Number of complications</td>
<td>-1.209</td>
<td>.975</td>
<td>-.125</td>
<td>.217</td>
<td></td>
</tr>
<tr>
<td>Number of comorbidities</td>
<td>-.674</td>
<td>1.429</td>
<td>-.045</td>
<td>.638</td>
<td></td>
</tr>
<tr>
<td>Self-perceived health</td>
<td>1.260</td>
<td>1.958</td>
<td>.060</td>
<td>.521</td>
<td></td>
</tr>
<tr>
<td>Self knowledge</td>
<td>-.095</td>
<td>.152</td>
<td>-.056</td>
<td>.533</td>
<td></td>
</tr>
<tr>
<td>Stability of self concept</td>
<td>-.589</td>
<td>.210</td>
<td>-.231</td>
<td>.006**</td>
<td></td>
</tr>
<tr>
<td>Depressive symptoms</td>
<td>-8.44</td>
<td>.358</td>
<td>-.225</td>
<td>.020*</td>
<td></td>
</tr>
</tbody>
</table>

* The predictor is significant at the 0.05 level (2-tailed); **The predictor is significant at the 0.01 level (2-tailed)

Secondly, regression analysis is carried out with depressive symptoms as the dependent variable and the two dimensions of self-consistency (self-knowledge and stability of self-concept), demographics and health measures as the independent variables. Table 25 showed that self-perceived health, self-knowledge, and stability of self-concept were significant predictors (p < 0.05) with standardized coefficients of 0.234, -0.242, and -0.148 respectively. The R² of 0.342 indicates that 34.2% variance in depressive symptoms is a function of this model.
Based on the results of multiple regression analysis, a path model was formed to illustrate the effect of self-consistency, depressive symptoms, duration, and SPH on self-care. Figure 2 showed that the stability of self-concept, depressive symptoms directly negative predicted self-care; duration directly positive predicted self-care; self-knowledge, stability of self-concept, and SPH all directly negative predicted depressive symptoms. Therefore, although self-knowledge and SPH do not directly predict self-care, they can indirectly predict self-care through depressive symptoms.
The predictor is significant at the 0.05 level (2-tailed); **The predictor is significant at the 0.01 level (2-tailed)

Figure 2. Pathway model of how variables affect self-care
CHAPTER 5: DISCUSSION

This chapter presents the findings, conclusions, implications, and recommendations of the current study. The first section of this chapter discusses the study sample. The second section discusses analyzed data regarding research questions and tested hypotheses. The third section concludes the study findings including limitation of the study. The fourth section discuss implications of the current study to nursing education and practice. The last section provides recommendations for future research.

Discussion of the Sample

This section discusses the characteristics of the demographics and health measures of the study sample. The sample’s characteristics were primarily compared to the findings of large-scale surveys conducted in China, as well as to the sample of previous studies conducted among community older adults with type 2 diabetes in Shanghai over the last five years.

Characteristics of Demographics of the Study Sample

The mean age of the participants was 71.6 ± 8.4 years old, which is similar to findings reported by Xu et al. (2021) (74.2 ± 6.5), Liu (2020) (73.79 ± 7.60), and Liu (2017) (70.16 ± 7.47) for older adults with type 2 diabetes in the Shanghai community. Regarding gender, in the current study, 49.7% of the participants were male, and 50.3% were female. This is consistent with the finding of a national survey that showed that the male-to-female sex ratio of elderly diabetic patients with type 2 diabetes in China is roughly 1:1; that is, the number of men and women is almost equal (Li et al., 2020). For education level, only 5.6% of participants had a college degree or higher. Most of the participants in this study had junior high school education (41.0%) or high school
education (28.2%). According to data from the Guideline for the Management of Diabetes Mellitus in the Elderly in China (2021 Edition) (2021), the education level of the elderly with type 2 diabetes in China is mostly middle school and below. Primary school and below accounted for 33.6%, junior high school accounted for 38.8%, and high school/technical school accounted for 20.5%. In general, the educational levels of the participants in the current study were higher than the national average. This may be because Shanghai is located in one of the more economically developed regions within the country, and the residents generally possess a higher education level.

Most participants were married (82.1%) while the rest were widows or widowers and divorced, comparable to Liu’s (2020) study in which married participants accounted for 81.41% of older adults with type 2 diabetes in the Shanghai community. The mean monthly family income per person was ¥3962.0 ± 2542.0 in the current study. In other studies, monthly income was reported as classified data; for example, Xu et al. (2021) reported that 85.9% of the study participants’ per capita monthly family income was between 3000–5999, and Liu’s (2020) study reported that 71.1% of participants had a per capita monthly family income between 2500–5500, indicating the average income in the current study to be comparable with above-mentioned studies.

**Characteristics of Health Measures of the Study Sample**

The mean duration of type 2 diabetes was 10.2 ± 7.7 years, comparable to Liu’s (2017) study, which was 11.37 ± 7.63 years. The mean HbA1c for the current study was 7.3 ± 1.5%. Zhang et al. (2022) investigated the blood glucose levels of older adults in the Qibao community in Shanghai, and reported that the mean HbA1c level was slightly higher than in the current study, 7.8% ± 0.1%. Overall, the average level of HbA1c in this
study did not meet the standard recommended by clinic guidelines, which was ≤7% (2022). Over half of the sample (53.8%) had a high level of BMI (≥24), and 43.6% of participants were normal, relatively comparable to Liu (2020) study in which a normal BMI accounted for 49.58% of their study participants.

Excess body weight can cause insulin resistance, making it more difficult for cells to absorb glucose, leading to high blood sugar levels. This can have negative effects on the organs over time, leading to complications such as nerve damage, kidney disease, and cardiovascular disease. Therefore, health providers need to emphasize the importance of weight control for older adults with type 2 diabetes, help them determine an appropriate BMI goal, and develop a personalized plan for achieving the goal. The mean number of complications and comorbidities for the current study was 2.0 ± 1.4 and 1.0 ± 0.9, respectively. The number of complications was different from that of Liu’s (2020) study, in which 88.4% of older adults did not have complications, and most of the remaining 11.6% had one or two complications. The number of comorbidities was similar in these two studies. The difference in the number of complications may be due to the fact that Liu’s questionnaire did not investigate hypertension as one of the complications of diabetes. Complications and comorbidities of diabetes can significantly influence an individual’s health and quality of life if not managed appropriately. The mean score for self-perceived health was 3.2 ± 0.64. This indicates that the sample in the current study exhibits an average level of overall health. This finding is comparable with that of Liu (2020), who found that 65.0% of older adults perceived their health condition as average.

Discussion of the Results
Five research questions were formulated for this study, including that: (1) What is the relationship between self-consistency and self-care among older Chinese adults with type 2 diabetes? (2) What are the bivariate relationships among depressive symptoms, self-consistency, and self-care among older Chinese adults with type 2 diabetes? (3) What are the bivariate relationships among demographics (gender, age, education level, marital status, family monthly income), self-consistency, and self-care in older Chinese adults with type 2 diabetes? (4) What are the bivariate relationships among health measures (duration of disease, hemoglobin A1c [HbA1c], body mass index [BMI], number of complications, number of comorbidities, self-perceived health), self-consistency, and self-care in older Chinese adults with type 2 diabetes? (5) What are the predictors of self-care among self-consistency, demographics (gender, age, education level, marital status, family per capita monthly income), health measures (course of disease, HbA1c, BMI, number of complications, number of comorbidities, self-perceived health), and depressive symptoms in older Chinese adults with type 2 diabetes? Research hypotheses were tested under each research question. Below present the findings of each hypothesis for a respective research question.

**Hypothesis 1 - Research Question 1**

The first hypothesis is that self-consistency has a significant positive relationship with active self-care behaviors in older Chinese adults with type 2 diabetes. However, the findings did not support this hypothesis. Pearson’s correlation coefficient showed that there was no statistically significant relationship between self-consistency and self-care overall. Therefore, Hypothesis 1 was rejected. According to self-consistency theory, self-consistency is an adaptive response in which the individual forms an understanding of
who he or she is, consisting of an organized set of congruent self-perceptions integrated into a coherent whole (Elliott, 1986). When people face challenging or potentially challenging situations, behaviors relative to self-consistency can be observed in a person’s adaptive response. Therefore, the current study hypothesized that self-consistency would be significantly correlated with the self-care behaviors of older adults with type 2 diabetes. The findings showed that SCS total scale was not significantly correlated to self-care total, and the subscale stability of the self-concept had a significant negative correlation with blood sugar testing, foot care and self-care total. One possibility is that older adults with type 2 diabetes who have a stable self-concept may feel more confident in managing their condition, resulting in less frequent blood sugar testing and feet check. On the other hand, those with a less stable self-concept may feel less confident about how to manage their condition, leading them to test their blood sugar and check their feet more frequently as a way to gain reassurance. Additionally, it could be the case that individuals with a lower self-consistency may experience greater anxiety or worry related to their condition. This increased psychological distress may motivate them to test their blood sugar and check feet more frequently to ensure that they are maintaining optimal control of their diabetes. The four items of stability of the self-concept which correlated with self-care all refers to thinking about self. Since these four items are reverse scoring, that is, the more frequently thinking about who I am, the more active self-care behaviors participants have. By reflecting on personality and tendencies, older adults may be able to identify any patterns or habits that could be negatively affecting their health, such as stress-eating or avoiding exercise. They can then actively work on correcting these behaviors by developing new healthy habits, such as checking
feet and testing blood sugar into their routine or learning coping mechanisms for managing stress. Additionally, self-reflection can also help with setting goals and creating a personalized plan for managing Type 2 Diabetes. By understanding the strengths and weaknesses, people can tailor their approach to managing the condition to suit needs, lifestyle, and preferences. Therefore, having a deep understanding of oneself by examining the personality and habits, people can gain valuable insights that will allow them to make positive changes to manage their condition more effectively.

Although self-knowledge did not correlate to self-care significantly, there are three items of self-knowledge significantly positive correlated with self-care. These three items refer to a positive self-awareness. The positive correlation indicated that the more positive the attitude of older people towards themselves, the more positive self-care behaviors they have. Positive self-awareness can improve an individual's confidence level in managing diabetes. They become more aware of their strengths and feel more confident in making healthy choices, including following a balanced diet, staying physically active, and monitoring their blood sugar levels. In addition, positive self-awareness leads to greater emotional stability, which can help reduce negative emotions. For people with type 2 diabetes, emotional distress can exacerbate the symptoms of the disease and lead to poorer treatment outcomes (Perrin, et al., 2017). By managing stress levels through positive self-awareness, individuals living with type 2 diabetes may experience fewer health problems, leading to better self-care practices.

The research hypothesis 1 that was rejected could be attributed to cultural differences between East and West. The instrument used in the current study was developed in Western culture. Although the SCS had good internal consistency
(Cronbach’s alpha = 0.88), one limitation was that the validity of the SCS was not measured in the current study. Therefore, the Chinese version of the SCS may require further cultural adjustment to accurately reflect theoretical constructs of self-consistency among Chinese population. The relationship between self-consistency and self-care is discussed further below, based on the results of Hypothesis 5.

**Hypothesis 2 - Research Question 2**

The second hypothesis is that depressive symptoms have a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Hypothesis 2 was supported. Pearson correlation analyses showed that depressive symptoms had a significant negative correlation with self-consistency and the two subscales of self-knowledge and stability of self-concept. The findings indicated that the more consistent the participants’ self-concept was, the less likely they were to experience negative emotions, such as depression. This finding supports other studies on older adults. Zhan’s (2000) study showed significantly negative correlations between self-consistency and depression among hearing impaired elderly. Zhu et al. (2021) investigated the relationship between self-consistency and depression in a sample of 158 Chinese retirees. They found that higher levels of self-consistency were significantly associated with lower levels of depressive symptoms, even after controlling for other factors, such as gender, education, and health conditions. Similar results were found by Kiropoulos et al. (2019) and Gao (2019). People with low self-consistency often experience difficulty maintaining a positive attitude and seeking assistance from others when facing stress, putting them at risk of developing depression (Wang et al., 2014). Self-inconsistency negatively affects the individual’s avoidance, withdrawal, and distress
and affects the individual’s subjective well-being (Zhang et al., 2017). Eventually, this can lead to depressive symptoms, including the feeling that their life is meaningless, worthlessness, lack of happiness, and decreased vitality, which are known to be potential precursors of depression. Therefore, having a stable and consistent sense of self may serve as a protective factor against emotional distress among older adults with type 2 diabetes.

Pearson correlation analyses also revealed that depressive symptoms had a significant negative correlation with self-care and the subscale of exercise. Several recent studies have had similar findings. For example, Trevizani et al. (2019) found that older adults with diabetes who had more severe depressive symptoms were less likely to engage in health-promoting behaviors, such as regular exercise, healthy eating, and medication adherence. Similarly, Li et al. (2017) found that depressive symptoms were negatively associated with self-care activities, such as foot care, exercise, and healthy eating. These findings suggest that self-care behavior may play a protective role in preventing or managing depressive symptoms in older adults with diabetes. Overall, these studies suggested a complex interplay between depressive symptoms and self-care behavior in older adults with diabetes. Depressive symptoms can make it more difficult for individuals to engage in healthy behaviors, which in turn can lead to poorer diabetes outcomes and an increased risk of depression. Thus, it is important for healthcare providers to screen for and address both depression and self-care behaviors in the care of older adults with diabetes.

_Hypotheses 3a–3g – Research Question 3_
Hypothesis 3a states that male will have significantly higher self-consistency than female older Chinese adults with type 2 diabetes. Even though males had a higher score (83.69 ± 9.11) than females (81.00 ± 8.72), the differences in self-consistency and its subscales between male and female participants were not statistically significant. Thus, Hypothesis 3a was rejected. This is different from the findings of Zhan (2000), which showed that males scored significantly higher than females, as the male participants perceived their health and personal well-being more positively than the women in the study. The positive perceived health and well-being reflect an optimistic cognition of self, which promotes a better sense of self-consistency. However, in the current study, the perceived health showed no significant difference between male and female participants (P=0.069). This may explain why the findings of the current study differed from Zhan’s (2000) study. Additionally, Zhan’s study focused on hearing loss and women were more sensitive to their outlook and perceived by others if they could not hear well, so female got a lower score of self-consistency than male. Furthermore, other factors that may have an impact on self-consistency, such as age, income, disease duration, did not differ between male and female participants. The similarities of characteristics in the sample may explain why there was no difference in self-consistency between genders.

Hypothesis 3b states that older female Chinese adults with type 2 diabetes report significantly higher levels of self-care than older male Chinese adults. The findings did not fully support this hypothesis except that male and female participants was significant different on the exercise subscale in which males scored significantly higher than females. The current study is comparable to Liu’s (2020) study which showed no difference in self-care between older male and female adults with type 2 diabetes in Shanghai.
However, gender alone may not be able to explain self-care behaviors if there were similar characteristics between male and female participants.

Hypothesis 3c is that age has a significant negative relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes. Hypothesis 3c was only partially supported. The findings showed that age had a significant negative correlation with the self-knowledge subscale, but the correlations to total self-consistency and to the stability of self-concept subscale were not statistically significant. The results are similar to Zhan’s study (2000) in which self-consistency did not vary with age. Perhaps, some older people may have formed their views of self in their life so that their stability of self-concept may not change much with aging. For self-care, there was no statistically significant relationship between age and the overall self-care scale in this study. However, age had a significant negative correlation with the exercise subscale. In Liu’s research, age was negatively correlated with self-care (2020). For older adults with type 2 diabetes, their complications and comorbidities gradually increase with age, and the patient’s memory and cognitive level gradually decline, resulting in the difficulty of stable implementation of disease self-care behaviors, such as blood glucose monitoring and medication adherence (Liu, 2020). However, in the current study, only exercise decreased with age, which may be due to reduced physical strength in older adults, as it is difficult for them to exercise as frequently and intensively as younger adults.

Hypothesis 3d is that older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-consistency than those with less than a bachelor’s degree. Hypothesis 3d was partially rejected. There were no significant differences in the overall SCS scale. This is contrary to the findings by Cai
(2020), who showed that hospitalized diabetics with secondary and higher education backgrounds were 0.433 times more likely to have higher self-consistency than those who had never been educated in school \((p = 0.042)\). The difference between the two studies may be due to the fact that the survey scales of self-consistency were different and that illiteracy was not classified in the current study. As in the current study, Zhan (2000) showed no differences in self-consistency among different education levels, but she did not compare the subscales. The findings of the current study showed that participants with a high school education level had significantly higher levels of self-knowledge than primary school or below and junior high school. The possible reason may be that people with higher level of education are more inclined to think about self and learn knowledge related to the disease. Rogers et al. (1967) argued that the two main factors of self-concept are childhood experiences and evaluations of others. A lack of education at a young age may affect the way people see themselves and accept life experiences, and influence individuals to shape their ideal selves.

Hypothesis 3e is that older Chinese adults with type 2 diabetes with bachelor’s degrees and above report significantly higher levels of self-care than those with less than a bachelor’s degree. Hypothesis 3e was rejected. Although one-way ANOVA analysis showed that there were significant differences in the SDSCA total, post hoc analysis did not find a significant difference between any two groups. Liu (2018) obtained the same results in a survey of the self-care behavior of elderly patients with diabetes in Zhengzhou. Yet, some researchers discovered that the self-care behavior of people with diabetes was somewhat influenced by their degree of education (Liu, 2020; Quan, 2013; Zhu, 2011). Patients with higher levels of education performed better than those with
lower levels of education. The reason might be that patients with greater levels of education may become more adept at learning knowledge about diabetes self-care and are more willing to devote time, effort, and expenses to treating and managing diabetes. The difference between the results of those studies and the current study may be due to the small sample of highly educated people in this study. Only 11 people had a college degree or higher in the current study.

Hypothesis 3f states that married older Chinese adults with type 2 diabetes report significantly higher levels of self-consistency and self-care than those who are not married. Hypothesis 3f was partially supported. The results showed no statistically significant differences between marital status on the overall SCS scale or on the overall SDSCA scale. Zhan (2000) also found no association between self-consistency and marital status. However, in the current study, married participants reported significantly higher scores on the self-knowledge subscale than non-married participants (p <0.01). On the contrary, non-married participants reported significantly higher on the stability of self-concept subscale than married participants (p <0.05). Being in a committed relationship and having a supportive spouse may contribute to greater social support, which could be linked to improved self-knowledge among people with chronic illnesses. Wilson and Dunn (2004) stated that looking at ourselves through the eyes of others and observing our own behavior could help to increase self-knowledge. The insights of spouses can help older adults with type 2 diabetes to gain a deeper understanding of their own personality and tendencies. This view can also be used to explain why non-married participants reported significantly higher on the stability of self-concept subscale than married participants. Being married comes with a set of responsibilities that may affect
individual’s identity and self-concept. Without the influence of their spouse's perspective, older adults may have a more consistent and stable understanding of their self-concept.

Findings on the relationship between marital status and self-care behaviors among older adults with diabetes are inconclusive. Similar to the current study, some studies have found that self-care does not vary with marital status (Gao, 2018; Liu, 2020; Zhuo, 2021) whereas another study reported that older adults without spouses had a lower level of self-care than older adults with spouses (Liu, 2018). In the current study, participants who were married reported significantly higher exercise subscale scores than participants who were not married. This finding is similar to Quan (2013), who also found that people with spouses had better self-management levels than others. With the company of their spouses, older adults were more willing to participate in daily exercise.

Hypothesis 3g for the current study states that family monthly income per person has a significant positive relationship with self-consistency and self-care among older Chinese adults with type 2 diabetes. Hypothesis 3g was partially supported. There were no significant relationships between income and the overall SCS or SDSCA scales. Similar to the current study, Zhan’s (2000) findings indicated no relationship between self-consistency and income. Wu’s (2014) study of Tibetan adults also showed that self-consistency did not differ significantly in terms of annual income. However, income had a significant positive correlation with self-knowledge subscale. Higher income is often associated with higher levels of education and intellectual engagement, which can also facilitate self-knowledge. Those who have had access to education and other intellectual opportunities may be more likely to have developed the skills needed to reflect critically on their own thoughts and experiences.
Self-care did not relate to income, which was similar to the findings by Liu (2020) and Campbell et al. (2017). Unlike the current study, a review concluded that a higher income level was positively related to better diabetes self-management (Luo et al., 2015). Yet, income was positively correlated with the general diet and exercise subscales, which was similar to the findings of Xia and Tang (2011) and Mogre et al. (2019). The findings could be attributed to the fact that higher-income individuals may have better access to healthier foods and exercise opportunities. In addition, older adults with higher incomes may be better educated about healthy eating and exercise habits, which could translate to better choices for managing their diabetes.

**Hypotheses 4a–4g – Research Question 4**

Hypothesis 4a states that the duration of disease has a significant positive relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes. Hypothesis 4a was rejected. Duration of disease did not significantly correlate with self-consistency or any of its subscales. In Zhan’s (2000) study, self-consistency did not correlate with years of hearing loss, which is similar to the current study. Duration of disease did not correlate with self-care, either. Du et al.’s (2022) survey of hospitalized patients with diabetes had similar findings, and there was no difference in the SDSCA scores of patients with type 2 diabetes among different disease durations. However, several studies have found that patients with longer durations of diabetes have better self-care of disease (Ausili et al., 2018; Wang et al., 2012; Zhu et al., 2011).

In the current study, duration of disease was positively correlated with four subscales of self-care: general diet, exercise, foot care, and medication. As with the current study, Wang et al. (2017) also found that the duration of disease was associated
with diet, exercise, foot care, and medication of people with type 2 diabetes in the community. Quan (2013) investigated the factors of self-care behaviors of middle-aged and older patients with type 2 diabetes. The results showed that individuals with higher diet scores were more likely to have had diabetes for a longer duration. These findings may be because patients with a long duration of disease have received long-term treatment and compared with patients with a shorter duration of disease, they have received more guidance from health providers to understand how to eat healthily, exercise, and check their feet routinely, and adhere to medicine taking. Moreover, the experience of long-term disease treatment and management has continuously improved the patient’s self-care ability.

Hypothesis 4b is that participants with a normal BMI report a significantly higher level of self-consistency than those who have BMI’s outside of the normal range. This hypothesis was rejected. There was no statistically significant difference between low, normal, or high BMI in self-consistency. Among the literature reviewed, no studies have examined the relationship between self-consistency and BMI.

Hypothesis 4c is that participants with a normal BMI report a significantly higher level of self-care than those who have BMI’s outside of the normal range. Hypothesis 4c was rejected. Participants did not differ significantly in self-care based on three different levels of BMI (low, normal, and high). This finding is contrary to Liu’s (2020) and Yan’s (2021) results, which revealed BMI as a factor that influenced diabetes’ self-care behaviors. Obesity and overweight are two risk factors for type 2 diabetes self-care.

Hypothesis 4d states that HbA1c levels have a significant negative relationship with self-consistency and self-care in older Chinese adults with type 2 diabetes.
Hypothesis 4d was rejected. HbA1c did not correlate with self-consistency. This finding is contrary to Cai’s (2020) findings. Cai’s study revealed that self-consistency had a predictive effect on HbA1c in diabetic patients. In the current study, HbA1c did not correlate with self-care. Sun (2020) had a similar finding, which showed that there was no difference in self-management between patients with normal or abnormal HbA1c. However, this is contrary to the findings of Jafarian-Amirkhizi (2018), who found that HbA1c was negatively correlated with self-care.

Hypothesis 4e states that the number of complications has a significant negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Hypothesis 4e was partially supported. The number of complications only had a significant negative correlation with the self-knowledge subscale but not self-consistency overall. Older adults may face physical limitations or cognitive decline that make it more challenging for them to acquire new information or remember previous instruction. This could lead to a decrease in self-knowledge over time, particularly if the individual has not received adequate support or education to adapt to these changes. For self-care, the number of complications was significantly negatively correlated with self-care overall and the exercise subscale. Wang and Zhang (2012) and Wang et al. (2012) also found a negative association between the number of complications and self-care. Quan (2013) found that compared with patients with complications, patients without complications were relatively better at self-management behaviors of exercise. It could be that the complexity of managing complications has made self-care more challenging for patients with diabetes. Experiencing complications due to their condition may decrease motivation of individuals with diabetes to learn how to manage it effectively. Negative
emotional associations with the disease could also impact their willingness to engage in self-care activities.

Hypothesis 4f is that the number of comorbidities has a significantly negative relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Hypothesis 4f was partially supported. The number of comorbidities significantly negative correlated with self-consistency overall and the self-knowledge subscale. Li et al. (2019) found that coronary heart disease patients with heart failure and arrhythmias had lower levels of self-consistency than those without comorbidities. Older adults with multiple comorbidities may experience more physical symptoms, functional limitations, and cognitive impairments than those with fewer or no comorbidities. These symptoms and limitations can affect the ability of older adults to engage in a consistent pattern of behavior or decision-making, leading to a decrease in self-consistency.

Du et al. (2022), Sun (2020), and Kerr et al. (2007) examined the relationship between comorbidities and self-care and found that patients with comorbidities scored lower on self-care than those without comorbidities, and the more comorbidities, the lower their self-care scores. Patients who have multiple comorbidities may struggle to manage several illnesses simultaneously, which could lead to a decreased focus on their diabetes care and ultimately result in inadequate self-care. In the current study, however, there was no significant relationship between the number of comorbidities and self-care overall, which is the same as the findings of Liu’s (2020) study. However, the number of comorbidities had a significant negative correlation with the exercise subscale. This could possibly be explained by the limitations posed by comorbidities on the activities of older adults with type 2 diabetes, leading to non-adherence to exercise self-care behaviors.
Hypothesis 4g states that self-perceived health has a significant positive relationship with self-consistency and self-care behaviors in older Chinese adults with type 2 diabetes. Hypothesis 4g was partially supported. As expected, SPH had a significant positive correlation with self-consistency overall and with the self-knowledge subscale, comparable to Zhan’s (2000) study which found the similar relationship between SPH and self-consistency. A strong sense of self-consistency may lead to positive adaptive responses to illness or disease and thus perceived better health and wellbeing. In addition, older adults with a good perception of health will have more participation in community activities. Social participation has a positive effect on maintaining and improving the self-consistency of older adults (Liu, 2006). However, SPH was not correlated with self-care in this study. The relationship between SPH and self-care have been contradictory in other studies. The findings of Chang et al. (2005) in a study of Taiwanese citizens with diabetes showed that self-perceived fair health were significantly more likely to take medication regularly compared with self-perceived good health people. However, Mayberry et al. (2020) and Borba et al. (2018) reported that self-perceived health was positive correlated with diabetic adherence, especially medicine adherence that poorer self-perceived health was associated with prevalence of non-adherence.

**Hypothesis 5 – Research Question 5**

Hypothesis 5 states that self-consistency, duration of disease, HbA1c, self-perceived health, and depressive symptoms are significant predictors of self-care in older Chinese adults with type 2 diabetes. Hypothesis 5 was partially supported.
For many people with diabetes, a lifelong chronic disease, self-consistency could be affected by the physical and mental stress experienced during the duration of the disease. The literature suggests that the self-care behaviors of diabetic patients are closely related to their mental health, and that self-consistency is a positive predictor of individuals' mental health. Based on the above conclusions, the current study hypothesized that self-consistency would predict self-care positively. The results showed that the two subscales of self-consistency had different effect pathways on self-care. Stability of self-concept negatively predicted self-care directly and self-knowledge positively predicted self-care indirectly. It may be interesting to add the variable of duration of the disease to the model as duration in this study showed significant correlation with self-care behaviors. The longer duration of older adults with type 2 diabetes the more self-knowledge they acquire, and the more likely for them to engage in self-care activities. The negative effect of stability of self-concept in this study showed negative effect on depressive symptoms, and thus had negative effect on self-care. It could be explained that less stable of self-concept leads to higher level of depression and less active of self-care. Cai (2020) investigated 223 patients with diabetes in China and the results showed a positive correlation between self-consistency and self-management in which self-consistency explained 8.8% of the variation in their diabetes self-management. The question was raised as to why in the current study stability of self-concept was negatively correlated with self-care behaviors? It could be explained by several factors. First, the study participants are different as the current study were older adults who managed their diabetes in the community whereas Cai’s (2020) study sample was hospitalized adult diabetic patients. Self-consistency is predictive for self-
management in hospitalized patients who are required for timely and needed adaptive responses. Older adults in this study had relatively self-manageable chronic conditions, which could contribute to a stable self-concept, and in turn, showing no effect or negative effect on self-care. Secondly, the instrument used in Cai’s study was self-management whereas in this study was self-care behaviors, and comparison of two scales’ Psychometric properties remain to be examined. Thirdly, Self-consistency instruments used between the current study and Cai’s study were different. The Self-Consistency Scale (Zhan & Shen, 1994; Zhan, 2000) used this study is an English instrument and then was translated to the Chinese language while Cai (2020) used an original Chinese language scale (Wang, 1994). Whether these two scales measure the similar theoretical constructs remains to be examines. Finally, the two studies used different statistical methods to examine the predictable relationship between self-consistency and self-care. Cai (2020) used univariate linear regression analysis, while the current study used multivariate linear regression analysis. When other factors are incorporated into the model, the interaction between variables may produce different results.

However, both two subscales (self-knowledge and stability of self-concept) of self-consistency positively predict self-care through depressive symptoms. When self-consistency improves, the depressive symptoms decrease, thus contributing to increase self-care behaviors. The result suggests that depressive symptoms serve as a mediator between self-consistency and self-care and is comparable to previous studies (Li, et al., 2014, Zhan, 2000). When individuals have a strong sense of self-consistency, they tend to experience greater emotional stability. This emotional stability can help protect against depression and reduce the intensity and frequency of depressive symptoms (Li, et al.,
2014). Self-knowledge involves accepting oneself for who they truly are, including strengths, weaknesses, and imperfections (Zhan, 2000). When individuals embrace their authentic selves, it can lead to increased self-acceptance and self-esteem (Cong et al., 2016). Having a positive perception of oneself can counteract negative self-image and beliefs associated with depression. Stability of self-care reflects the concepts of private self-consciousness, stability of self-concept and social anxiety. The lower score on stability of self-concept may contribute to higher private self-consciousness and higher social anxiety. Individuals’ self-consciousness has a stronger internal focus and more attending to their own thoughts and feelings, which may contribute to both negative or positive self-concept. Individuals may compare self to others, judge themselves based on perceived standards of perfection or social expectations, resulting in negative views of themselves. Low self-esteem and negative mental outlook can increase the risk of developing depressive symptoms. On contrary, lower self-consciousness may suggest more stable self-concept. Older adults with lower self-consciousness may be less prone to judge themselves for their condition or perceived shortcomings in managing their diabetes, fostering a more accepting and compassionate attitude towards oneself, and thus facilitating their engagement in self-care behaviors.

Duration of diabetes is a significant predictor of self-care, which is comparable with the findings of several studies. The longer an individual has lived with diabetes, the more likely they are to engage in self-care behaviors such as healthy eating, monitoring blood glucose levels, taking prescribed medication, and exercising regularly (Kim & Lee, 2019). Similarly, older adults with longer durations of diabetes had better self-management skills, such as regular monitoring of blood glucose levels, adherence to
medications and diet, and regular physical activity (Bains & Egede, 2011). These findings suggest that older adults with a longer duration of diabetes have developed a better understanding of necessity of self-care, gained more experience in self-care, and motivated to engage in self-care behaviors. Individuals who have had diabetes for a longer period of time may be more attuned to the potential complications associated with the disease and engaged in more comprehensive self-care practices (Aikens & Piette, 2013).

In the current study, self-perceived health indirectly affected self-care through depressive symptoms. It means when self-perceived health improves, the depressive symptoms decrease which leads to an increase of self-care activity. A positive self-perception of health can contribute to an overall positive mindset and outlook on life. When individuals perceive themselves as being in good health, they may feel more optimistic, hopeful, and satisfied with their lives. This positive mindset can help counteract negative thoughts and emotions associated with depression, resulting in an increased sense of self-efficacy (Lara-Cinisomo, et al., 2022). Older adults believe in their ability to successfully perform health-related tasks or achieve blood sugar control goals. This increased self-efficacy can positively influence their commitment to self-care practices. The direct effect of depressive symptoms on self-care was discussed below.

Several studies have found depressive symptoms to be predictors of self-care behavior in older adults with diabetes (Li et al., 2017; Mu et al., 2019; Trevizani et al., 2019). The current study supports this conclusion. Those with higher levels of depressive symptoms had poorer diabetes self-care behaviors, including less physical activity, fewer healthy meals, and less frequent glucose monitoring. One possible reason for this
relationship may be that depressive symptoms can affect an individual’s motivation and ability to engage in healthy behaviors. Negative mental states make it difficult for older adults to find the energy and motivation needed to prioritize self-care tasks. Additionally, depressive symptoms can lead to social isolation, which may reduce the availability of support from friends and family members, leading to a lack of encouragement to engage in healthy behaviors. Therefore, managing depressive symptoms in older adults with diabetes may be crucial for promoting proper self-care behaviors and improving overall health outcomes. The current study showed that self-consistency and self-perceived health were mediated by depression, either negatively or positively correlated. Healthcare providers should be aware of these connections to consider screening depressive symptoms, self-consistency, and self-perceived health for their patients.

HbA1c was considered a predictor of self-care. However, the findings did not support this hypothesis. Several studies have indicated that patients who engage in regular self-care activities achieve better blood glucose control, as measured by lower HbA1c levels (e.g., Bukhshet et al., 2016; Dragomir et al., 2010; Shrivastava et al., 2013). However, HbA1c was not a predictor of self-care in the current study. One possible explanation is that other factors such as age, disease duration, comorbidities, and medical treatment can also influence HbA1c levels. Some people may have good glucose control despite not adhering to the recommended self-care behaviors. For instance, they might achieve good glucose control through the use of medications, even if they do not follow a healthy diet or exercise regularly. Another explanation could be that, in general, self-care is a predictor of HbA1c levels, but the relationship may not be the same in the opposite direction.
Conclusions

In the current study, self-consistency, depressive symptoms, and a number of demographic and health measure variables were examined to determine their potential effects on the self-care behaviors of older adults with type 2 diabetes in Shanghai. The demographic variables included age, gender, education level, marital status, and monthly income per person. The health measure variables included diabetes duration, HbA1c level, BMI level, number of complications, number of comorbidities, and self-perceived health. Although many of the hypothesized associations between the variables were rejected, some of the proposed relationships were supported in the five research questions.

1. Self-consistency overall did not correlate with the self-care of older Chinese adults with type 2 diabetes while the stability of self-concept subscale correlated with the self-care.

2. Depressive symptoms had a significantly negative correlation with self-consistency and self-care in older Chinese adults with type 2 diabetes.

3. Self-consistency overall correlated with the number of comorbidities and SPH except age, gender, education level, marital status, income, duration, HbA1c, BMI, or number of complications.

4. Self-care overall correlated with the number of complications, but did not correlate with age, gender, education level, marital status, income, duration, HbA1c, BMI, number of comorbidities, or SPH.

5. Stability of self-concept and depressive symptoms directly negative predicted self-care; duration directly positive predicted self-care; self-knowledge, stability
of self-concept, and SPH directly negative predicted depressive symptoms; self-knowledge and SPH indirectly predicted self-care through depressive symptoms.

Implications

Self-consistency means having a stable and cohesive sense of identity over time. When older adults have a strong sense of self and know what they stand for, it becomes easier to take care of themselves. This is because when people have a clear understanding of themselves, they can make choices and decisions that align with their values and beliefs and keep healthy, both mentally and physically. Results of the current study showed that stability of self-concept subscale was a negative predictor of self-care of older adults with type 2 diabetes, implying that older adults with a quite stable self-concept may struggle to enact behaviors that manage their condition and support their overall health. Health providers need to be aware of this when working with older adults with type 2 diabetes and should take steps to encourage them to be more flexible in their thinking and behaviors regarding self-care. This might involve encouraging older adult patients to explore new ways of thinking about their health, or providing resources for developing self-care habits that could decrease their anxiety and increase their confidence in disease management.

Self-knowledge subscale positive predicted self-care indirectly. This implies that self-knowledge empowers older adults to actively participate in their own care. Health care providers should develop some effective ways to support and enhance the self-knowledge of older adults with type 2 diabetes. For example, healthcare providers may assess a sense of self knowledge in older adults with type 2 diabetes, encouraging their self-reflection, sharing feelings and experiences of disease management as well as
identifying their specific needs, preferences, and learning styles while teaching diabetes self-care and management. This will help health care providers tailor education and interventions to promote self-care management for older adults with type 2 diabetes.

Additionally, healthcare providers may develop strong relationships with older adults who has shorter durations of illness, as the current study suggests that duration are positive predictors of self-care, showing the shorter the disease duration, the fewer the self-care activities. Healthcare providers need to factor the duration of diabetes into teaching and clinical intervention to promote health for older adults with type 2 diabetes.

Depressive symptoms were also a negative predictor of self-care. Older adults who experience depressive symptoms find engaging in fewer self-care behaviors than those who do not have depressive symptoms. Individuals with depression may have difficulty being motivated to engage in self-care activities, which can result in a further decline in their overall health. Health providers may need to monitor older diabetic adults for depressive symptoms more closely, as they may be less likely to engage in self-care activities. This could involve regular check-ins, reminders, and resource provision to promote engagement in self-care activities. In addition, interventions to promote self-care may need to be tailored or modified to address depressive symptoms. For example, cognitive behavioral therapy (CBT) has been shown to be effective for both depression and promoting self-care; thus, CBT-based interventions could be adapted to include a focus on self-care. Finally, health providers may need to work collaboratively with mental health providers to address depressive symptoms and support engagement in self-care activities. This may involve incorporating mental health screening into routine care and ensuring that patients have access to appropriate mental health services, if needed.
Additionally, the current study revealed two association factors of self-consistency: the number of complications and self-perceived health, showing that health status is closely related to self-consistency in older people with diabetes. Health providers may need to consider the impact of comorbid conditions on older adults’ ability to maintain consistent patterns of thinking, feeling, and behaving. They may need to tailor treatment plans to address multiple conditions and support patients in managing the challenges associated with their comorbidity. Moreover, older adults with negative self-perceived health may experience a lack of motivation or hopelessness regarding their health status, which can lead them to feel less committed to managing their diabetes. Negative self-perceived health may be caused by comorbidities which may contribute to having depression symptoms and lower sense of self-consistency, or ones with depressive symptoms and lower sense of self may lead to negative self-perceived health. Healthcare providers may consider impacts of multifaceted cognition of self-consistency, and clinically diagnosed depressive symptoms and comorbidities on patient’s health and their perceptions of health. Holistic consideration for individual patients and using patient-centered interventions help meet patients’ needs, desires, and expectations, and ultimately improving patient care.

Limitations

First, the representation of the population is limited as the current study use non-probability sampling method. And a sample size with 195 participants may not big enough to accurately represent the population.

Second, the current study use a cross-sectional survey to collect data at a particular point in time. It is limited in the capacity to track and analyze temporal changes
in self-care of older adults. Additionally, cross-sectional surveys provide information about the variables under scrutiny at a given point in time, they cannot establish any causal relationship between these variables.

Third, the SCS scale used in the current study is developed in the background of west culture. Although the Chinese version has been reviewed by the original author, there may still be a bias in understanding of Chinese older adults due to differences between Eastern and Western cultures. Despite its high reliability, this study did not test the validity of this instrument.

**Recommendations**

Based on the findings and conclusions of the current study, the following recommendations are suggested for future research and nursing education. For nursing research:

1) Future research could expand the sample size and study sites to different districts in Shanghai to expand the representativeness of the sample. A large sample size can be used to build structural equation models to further examine the complex relationships between these variables, especially the relationship between self-consistency and self-care.

2) Future research could include a longitudinal study to examine changes in self-care over time and what may account for improvements or declines in self-care over the disease duration, and what effects of self-consistency on self-care behaviors over the disease duration.

3) Future research could investigate the relationship between self-consistency and self-care in people of all ages with diabetes. Further analysis could be performed to
determine whether the differences between the current study and previous findings are attributed to the fact that the current study’s sample consists of older adults.

4) Future research could examine the relationship between self-consistency and self-care for older adults with type 2 diabetes in the hospital settings as this study was conducted in the community centers.

5) Future research could address the cultural adaptation of the self-consistency scale for use in Chinese culture, along with a validity analysis to verify whether Chinese version conforms to the two-dimensional structure of the instrument.

6) Future research may use a qualitative method to explore meanings of self-consistency and self-care behaviors and gain a deeper understanding of the relationship between self-consistency and self-care behaviors among older adults with Type 2 diabetes.

Additionally, nursing education may integrate stability of self-concept, self-knowledge with self-perceived health, screened depressive symptoms, and self-care activities to a) holistically assess older adults with Type 2 diabetes, b) encourage self-reflection and share feelings, c) develop communication skills and motivational interviewing techniques to support patients to take an active role in their diabetes care.
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management among people with type 2 diabetes in Changsha]. [Master’s Thesis, Central South University]. WanFang Database.


Appendix A: University of Memphis IRB Approval
Institutional Review Board
Division of Research and Innovation
Office of Research Compliance
University of Memphis
315 Admin Bldg
Memphis, TN 38152-3370

January 11, 2022

PI Name: Jing Hu
Co-Investigators:
Advisor and/or Co-PI: Larry Slater
Submission Type: Initial
Title: Self-consistency and Self-Care among Older Adults with Type II Diabetes
IRB ID: #PRO-FY2022-268
Exempt Approval: January 10, 2022

The University of Memphis Institutional Review Board, FWA00006815, has reviewed
your submission in accordance with all applicable statuses and regulations as well as
ethical principles.

Approval of this project is given with the following obligations:

1. When the project is finished a completion submission is required
2. Any changes to the approved protocol requires board approval prior to
implementation
3. When necessary submit an incident/adverse events for board review
4. Human subjects training is required every 2 years and is to be kept current at
citiprogram.org.

For any additional questions or concerns please contact us at irb@memphis.edu or
901.678.2705

Thank you,

James P. Whelan, Ph.D.
Institutional Review Board Chair
The University of Memphis.
Appendix B: Letters of Support from Community Centers
October 28, 2021

Jing Hu, PhDc, RN
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
Loewenberg College of Nursing, The University of Memphis
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

Dear Ms. Hu,

I am pleased to write this letter in strong support for the recruitment of participants from and use of the facilities at Heqing Community Health-Care Center for your dissertation project entitled “Self-Consistency and Self-Care among Older Adults with Type II Diabetes”. Heqing Community Health-Care Center, as the primary health care institution in Heqing Town, provides health services for a large number of elderly diabetic patients every year, and helps them improve their self-care ability through health education.

My staff and I will gladly support your study by:

a) Introducing your study to older adults with type II diabetes and providing them with your research flyer;

b) Seeking permission from potential participants for you to contact them about the study, and

c) Providing a private space for conducting study interviews.

If there are any other way that our center can assist you, do not hesitate to contact me by email or phone. I look forward to working with you on our center in the coming months!

Sincerely,

Huaoshan Tang
Science and Education Section of Heqing Community Health Service Center.
合作信

胡薪老师你好！

我非常愿意为你的博士课题“老年糖尿病患者自我一致性与自我照顾能力的关系研究”提供研究场地并帮助你招募研究参与者。合庆社区卫生服务中心作为合庆镇的初级医疗卫生服务机构，每年为大量的老年糖尿病患者提供健康服务。通过健康教育帮助他们提高自我照顾能力。

按照我们前期的沟通，我及我们中心的工作人员将从以下几个方面支持你的研究的开展。

（1）向社区看病的老年糖尿病患者介绍你的研究并展示本研究的宣传单
（2）允许你接触愿意参与本研究的老年糖尿病患者开展调查
（3）为你提供一个相对安静且隐蔽的调查场所。

如果你还有其他地方需要我们社区医院提供帮助，你可以通过邮件或电话与我联系，期待你来合庆社区卫生中心开展研究！
October 28, 2021

Jing Hu, PhDc, RN
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
Loewenberg College of Nursing, The University of Memphis
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

Dear Ms. Hu,

I am pleased to write this letter in strong support for the recruitment of participants from and use of the facilities at Zhoujiadu Community Health-Care Center for your dissertation project entitled “Self-Consistency and Self-Care among Older Adults with Type II Diabetes”. Zhoujiadu Community Health-Care Center, as the primary health care institution in Zhoujiadu Town, provides health services for a large number of elderly diabetic patients every year, and helps them improve their self-care ability through health education.

My staff and I will gladly support your study by:

a) Introducing your study to older adults with type II diabetes and providing them with your research flyer;

b) Seeking permission from potential participants for you to contact them about the study, and

c) Providing a private space for conducting study interviews.

If there are any other way that our center can assist you, do not hesitate to contact me by email or phone. I look forward to working with you on our center in the coming months!

Sincerely,

[Signature]

[Stamp]
2021年10月28日

胡警，博士研究生在读，注册护士，讲师
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
美国孟菲斯大学努温伯格护理学院
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

合作信

胡警老师你好！

我非常愿意为你的博士课题“老年糖尿病患者自我一致性与自我照顾能力的关系研究”提供研究场地并帮助你招募研究参与者。周家渡社区卫生服务中心是周家渡的初级医疗卫生服务机构，每年有大量的老年糖尿病患者接受健康管理，通过健康教育帮助他们提高自我照顾能力。

按照我们前期的沟通，我及我们中心的工作人员将从以下几个方面支持你的研究的开展：

（1）向来社区看病的老年糖尿病患者介绍你的研究并展示本研究的宣传单

（2）允许你接触愿意参与本研究的老年糖尿病患者开展调查

（3）为你提供一个相对安静且隐蔽的调查场所。

如果你还有其他地方需要我们社区医院提供帮助，你可以通过邮件或电话与我联系，期待你来周家渡社区卫生中心开展研究！

[手写签名]
November 9, 2021
Jing Hu, PhDc, RN
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
Loewenberg College of Nursing, The University of Memphis
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

Dear Ms. Hu,

I am pleased to write this letter in strong support for the recruitment of participants from and use of the facilities at Jinyang Community Health-Care Center for your dissertation project entitled “Self-Consistency and Self-Care among Older Adults with Type II Diabetes”. Jinyang Community Health-Care Center, as the primary health care institution in Jinyang Town, provides health services for a large number of elderly diabetic patients every year, and helps them improve their self-care ability through health education.

My staff and I will gladly support your study by:

   a) Introducing your study to older adults with type II diabetes and providing them with your research flyer;

   b) Seeking permission from potential participants for you to contact them about the study, and

   c) Providing a private space for conducting study interviews.

If there are any other way that our center can assist you, do not hesitate to contact me by email or phone. I look forward to working with you on our center in the coming months!

Sincerely,

李艳
金杨社区卫生服务中心科教科科长

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2021年11月9日
胡菁，博士研究生在读，注册护士，讲师
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
美国孟菲斯大学努温伯护理学院
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

合作信

胡菁老师你好:

我非常愿意为你的博士课题“老年糖尿病患者自我一致性与自我照顾能力的关系研究”提供研究场地并帮助你招募研究参与者。金杨社区卫生服务中心作为金杨街道的初级医疗卫
生服务机构，每年有大量的老年糖尿病患者提供健康服务，通过健康教育帮助他们提高自我
照顾能力。

按照我们前期的沟通，我及我们中心的工作人员将从以下几个方面支持你的研究的开
展:

（1）向来社区看病的老年人糖尿病患者介绍你的研究并展示本研究的宣传单

（2）允许你接触愿意参与本研究的老年人糖尿病患者开展调查

（3）为你提供一个相对安静且隐蔽的调查场所。

如果你还有其他地方需要我们社区医院提供帮助，你可以通过邮件或电话与我联系，期
待你来金杨社区卫生中心开展研究！

李艳
金杨社区卫生服务中心
科教科副科长
October 28, 2021

Jing Hu, PhDc, RN
Larry Z. Slater, PhD, RN-BC, CNE, FAAN
Loewenberg College of Nursing, The University of Memphis
4055 N. Park Loop, CHB 2502F
Memphis, TN 38152, USA

Dear Ms. Hu,

I am pleased to write this letter in strong support for the recruitment of participants from and use of the facilities at Caolu Community Health-Care Center for your dissertation project entitled “Self-Consistency and Self-Care among Older Adults with Type II Diabetes”. Caolu Community Health-Care Center, as the primary health care institution in Caolu Town, provides health services for a large number of elderly diabetic patients every year, and helps them improve their self-care ability through health education.

My staff and I will gladly support your study by:
   a) Introducing your study to older adults with type II diabetes and providing them with your research flyer;
   b) Seeking permission from potential participants for you to contact them about the study, and
c) Providing a private space for conducting study interviews.

If there are any other way that our center can assist you, do not hesitate to contact me by email or phone. I look forward to working with you on our center in the coming months!

Sincerely,

(Handwritten Signature)

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合作信

胡青老师你好！

我非常愿意为你的博士课题“老年糖尿病患者自我一致性与自我照顾能力的关系研究”提供研究场地并帮助你招募研究参与者。曹路社区卫生服务中心作为曹路镇的初级医疗卫生服务机构，每年为大量的老年糖尿病患者提供健康服务，通过健康教育帮助他们提高自我照顾能力。

按照我们前期的沟通，我及我们中心的工作人员将从以下几个方面支持你的研究的开展：

（1）向社区看病的老年糖尿病患者介绍你的研究并展示本研究的宣传单。

（2）允许你接触愿意参与本研究的老年糖尿病患者开展调查。

（3）为你提供一个相对安静且隐蔽的调查场所。

如果你还有其他地方需要我们社区医院提供帮助，你可以通过邮件或电话与我联系。期待你来曹路社区卫生中心开展研究！
Appendix C: Study Recruitment Flyers
Research Recruitment

Are you an older person with Diabetes?

Research Content

The purpose of this research is to investigate the relationship between self-consistency and self-care in Chinese older adults with type II diabetes. The information from the study will help to develop interventions that increase diabetes’ self-care behaviors for older adults living with type II diabetes.

Participants will be asked to complete a questionnaire that will last approximately 30 minutes.

If you meet the inclusion criteria below, we welcome you join us:

(1) Older adults 60 years of age or older;
(2) Clinically diagnosed with type II diabetes for more than 1 year;
(3) Able to communicate orally in Chinese.

Participating in the study will not expose your identity information. Your confidentiality and privacy will be protected. If you are interested in this study, please contact the research investigator, Hu Jing, 021-20262847. You may also ask questions of her faculty advisor, Dr. Larry Slater, lslater2@memphis.edu.
研究招募

欢迎老年二型糖尿病患者加入！

研究内容

本研究的目的是调查中国老年二型糖尿病人自我一致性和自我照护行为之间的关系，以期为后续开展促进老年二型糖尿病人自我照护行为的干预研究提供证据。

参与本项研究需要您填写一份问卷，调查员将会协助您完成。整个过程大约需要 30 分钟的时间。

如果您满足以下条件，欢迎您加入：
1. 年龄≥60 岁；
2. 诊断二型糖尿病 > 1 年；
3. 会讲中文

参与研究不会收集您的身份信息，所有资料将被严格保密，仅供研究人员分析数据时使用。如果您对本研究感兴趣，请您联系本研究负责人胡菁，电话号码 021-20262847。
Appendix D: Study Survey Instrument
Self-consistency and Self-Care among Older Adults with Type II Diabetes

Informed Consent

Dear Participant,

I invite you to participate in a research study entitled Self-consistency and Self-Care among Older Adults with Type II Diabetes. I am currently enrolled in the PhD program at the University of Memphis in Memphis, TN, USA, and am in the process of writing my dissertation. The purpose of this research is to investigate the relationship between self-consistency and self-care in older Chinese adults with type 2 diabetes.

The enclosed questionnaire has been designed to collect information on some demographic information and health measures about you. The questionnaire also includes questions on self-consistency, depressive symptoms, and self-care.

Your participation in this research project is completely voluntary. You may decline altogether or leave blank any questions you don’t wish to answer. There are no known risks to participation beyond those encountered in everyday life. Your responses will remain confidential and anonymous. Data from this research will be kept under lock and key and reported only as a collective combined total. No one other than the researchers will know your individual answers to this questionnaire.

If you agree to participate in this project, you will be one of approximately 200 participants to complete the survey. For the survey, please answer the questions on the questionnaire as best you can. It should take approximately 30 minutes to complete. Please choose the most suitable answer based on your condition for the questions on the questionnaire.

If you have any questions about this project, please feel free to contact Jing Hu, the principal investigator, telephone number 021-20262847. You may also ask the questions of her faculty advisor, Dr. Larry Slater, lslater2@memphis.edu. Information on the rights of human subjects in research is available through the University of Memphis’ Institutional Review Board at the University of Memphis, Memphis, TN 38152; website: https://www.memphis.edu/research/researchers/compliance/irb/index.php; (IRB @memphis.edu).

Thank you for your assistance in this important endeavor.

Sincerely yours,

Jing Hu
Part 1: Demographics

1. What is your age in years?

2. What is your gender?  ○ male  ○ female

3. What is your educational level?
   ○ primary school or below  ○ junior high school  ○ high school
   ○ college degree or higher

4. What is your marital status?
   ○ married  ○ never married  ○ divorced  ○ widow or widower

5. What is your family’s monthly income?

6. How many residents are there in your family?

Part 2: Health Measures

1. How long have you been diagnosed with TD2M?

2. When was your last HbA1c test?

3. Your height ___ cm; weight ___ kg

4. Do you have any comorbidities below?
   ○ cataract  ○ hypertension  ○ arthritis  ○ depression  ○ asthma  ○ coronary heart disease
   ○ hyperlipidemia  ○ backache  ○ cancer  ○ stroke  ○ osteoporosis  ○ hearing impairment
   ○ other diseases _________

5. Do you have any complications below?
   ○ cardiopathy  ○ hypertension  ○ stroke  ○ lower extremity venous disease (diabetic foot)  ○ Diabetic retinopathy  ○ Diabetic nephropathy

6. Overall, you would say your health is…,
   ○ very good  ○ good  ○ reasonable  ○ poor  ○ very poor
**Part 3: Summary of Diabetes Self-care Activities**

Instructions: The questions below ask you about your diabetes self-care activities during the past 7 days. If you were sick during the past 7 days, please think back to the last 7 days that you were not sick.

**Diet**

1. How many of the last SEVEN DAYS have you followed a healthy eating plan?

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2. On average, over the past month, how many DAYS PER WEEK have you followed your eating plan?

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3. How many of the last SEVEN DAYS did you eat five or more servings of fruits and vegetables?

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4. How many of the last SEVEN DAYS did you eat high-fat foods such as red meat or full-fat dairy products?

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**Exercise**

5. How many of the last SEVEN DAYS did you participate in at least 30 minutes of physical activity? (Total minutes of continuous activity, including walking).

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</table>

6. How many of the last SEVEN DAYS did you participate in a specific exercise session (such as swimming, walking, biking) other than what you do around the house or as part of your work?

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</table>

**Blood Sugar Testing**

7. How many of the last SEVEN DAYS did you test your blood sugar?

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</tbody>
</table>
8. How many of the last SEVEN DAYS did you test your blood sugar, the number of times recommended by your health care provider?

0 1 2 3 4 5 6 7

Foot Care

9. How many of the last SEVEN DAYS did you check your feet?

0 1 2 3 4 5 6 7

10. How many of the last SEVEN DAYS did you inspect the inside of your shoes?

0 1 2 3 4 5 6 7

Smoking

11. Have you smoked a cigarette—even one puff—during the past SEVEN DAYS?

0. No
1. Yes. If yes, how many cigarettes did you smoke on an average day?
Number of cigarettes:

Part 4: Self-Consistency Scale

Instructions: People have some sense of self to be able to function as individuals in the world. Sometimes, people’s sense of self is affected in different ways by having a chronic disease, such as diabetes. Below are statements about people’s sense of self. For each item, please circle the number closest to how you personally feel this way:

1 = never; 2 = rarely; 3 = sometimes; 4 = always

<table>
<thead>
<tr>
<th>When I think about myself lately, I</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Spend time thinking about what I am like</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. Feel that I am a person of worth, at least on an equal with others</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. Think to myself about what I am like</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. Spend time thinking about who I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. Get nervous in a social gathering</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. Tend to think “I am no good”</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td></td>
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<tr>
<td>7. Am able to do things as well as most other people</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>8. Understand who I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. Feel I am no good at all</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. Think how others are looking at me when I am talking to someone</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>11. Feel there is a lot wrong with me</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>12. Am sure that I know what kind of person I really am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>13. Am bothered if I do not dress appropriately for an event</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>14. Spend time thinking about what kind of person I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>15. Feel mixed up about myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>16. Feel I know just what I am like</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>17. Take a positive attitude toward myself</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>18. Feel mixed up about what I am really like</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>19. Feel changes like “some days I am happy with the kind of person I am. Other days I am not happy with the kind of person I am”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>20. Am satisfied with myself, on the whole</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>21. Certainly feel useless at times</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>22. Feel that I have a number of good qualities</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<tr>
<td>23. Feel changes like “some days I think I am one kind of person. Other days I am a different kind of person”</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>24. Am not much good at anything</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>25. Know for sure how nice I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>26. Feel I know just who I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>27. Change ideas about who I am</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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</tbody>
</table>
Part5: The 15-item Geriatric Depression Scale

1. Basically satisfied with your life
   ○ Yes  ○ No

2. Dropped many of your activities and interest
   ○ Yes  ○ No

3. Feel that your life is empty
   ○ Yes  ○ No

4. Often gets bored
   ○ Yes  ○ No

5. In good spirits most of the time
   ○ Yes  ○ No

6. Afraid something bad will happen.
   ○ Yes  ○ No

7. Feel happy most of the time
   ○ Yes  ○ No

8. Often feel helpless
   ○ Yes  ○ No

9. Prefer to stay at home
   ○ Yes  ○ No

10. Feel you have more problems with memory than most
    ○ Yes  ○ No

11. Think it is wonderful to be alive now
    ○ Yes  ○ No
12. Feel pretty worthless the way you are now
   ○ Yes       ○ No

13. Feel full of energy
   ○ Yes       ○ No

14. Feel that your situation is hopeless
   ○ Yes       ○ No

15. Think that most people are better off than you are
   ○ Yes       ○ No
老年二型糖尿病患者自我一致性与自我照顾行为的调查

知情同意书

亲爱的参与者，

我是美国田纳西州孟菲斯大学护理学院的一名博士研究生，我诚挚的邀请您参加一项题为"二型糖尿病老年人自我一致性与自我照护行为"的研究。本研究是我的博士论文课题，目的是调查中国老年二型糖尿病人自我一致性和自我照护行为之间的关系。

本次调查需要收集有关您的某些人口统计学和健康信息。除此之外，问卷还包括关于自我一致性、抑郁症状和自我护理的问题。

您是否参加这个研究项目完全是自愿的。您可以拒绝参加或拒绝回答问卷中任何您不想回答的问题。除了日常生活中遇到的风险之外，参与本研究不存在额外的风险。本次调查为匿名，相关数据将被严格保密。除了研究人员之外，其他人不会知道您对这份问卷的回答。

如果您同意参加此项研究，您将会是大约200个研究参与者之一。请尽可能回答问卷上的问题，每个问题根据您的情况选择最合适的答案。完成本次调查大约需要30分钟。

如果您对参与这项研究有任何疑问，请随时联系研究负责人胡菁，电话号码 021-20262847。您也可以咨询她的导师拉里·斯莱特博士，电子邮箱 lslater2@memphis.edu。关于研究中人权保护的信息可通过孟菲斯大学伦理审查委员会获得，网址: https://www.memphis.edu/research/researchers/compliance/irb/index.php; (IRB@memphis.edu).

非常感谢您对本研究提供的帮助!

孟菲斯大学护理学院 胡菁
第一部分：人口学资料

1. 您的年龄
2. 您的性别？
   ○男   ○女
3. 您的学历？
   ○小学及以下   ○初中   ○高中   ○大学及以上
4. 您的婚姻状况？
   ○已婚   ○未婚   ○离异   ○丧偶
5. 您的家庭月收入？
6. 您家庭常住人口有几位？

第二部分：健康资料

1. 您从诊断为二型糖尿病到现在有多长时间了？
2. 您最后一次测量糖化血红蛋白的数值是多少？
3. 您的身高和体重？  ____厘米  ____公斤
4. 您是否患有以下合并症
   ○白内障   ○高血压   ○关节炎   ○抑郁症   ○哮喘   ○冠心病   ○高血脂   ○背痛   ○癌症   ○中风
   ○骨质疏松症   ○听力障碍   ○其他疾病 ________
5. 您是否患有以下糖尿病并发症
   ○心脏病   ○高血压   ○脑血管意外   ○下肢血管病变   ○糖尿病视网膜病变   ○糖尿病肾病
6. 您认为自己总体的健康状况如何？
   ○非常好   ○好   ○一般   ○差   ○非常差
第三部分：糖尿病患者自我管理行为量表

指导语：下面的问题询问您过去7天的糖尿病自我护理行为。如果你在过去7天里生病了，请回想您生病之前的7天。

**饮食**

1. 近1周按糖尿病饮食要求合理安排饮食的天数
   0   1   2 3   4   5   6   7

2. 近1个月按糖尿病饮食要求合理安排饮食的天数
   0   1  2 3   4   5   6   7

3. 近1周摄入水果和蔬菜达5种或5种以上的天数
   0   1  2 3   4   5   6   7

4. 近1周摄入油食物或全脂奶制品的天数
   0   1  2 3   4   5   6   7

**运动**

5. 近1周进行持续时间>30min的运动情况(如散步等)
   0   1  2 3   4   5   6   7

6. 近1周进行中等强度活动的情况(包括快走、游泳、登山、骑自行车等)
   0   1  2 3   4   5   6   7

**血糖监测**

7. 近1周血糖监测的天数
   0   1  2 3   4   5   6   7

8. 近1周按医生要求监测血糖的天数
   0   1  2 3   4   5   6   7
### 足部护理

9. 近1周仔细检查自己脚部有无问题的天数

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10. 近1周检查鞋子内部有无异物、平整、舒适情况的天数

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### 药物治疗

11. 近1周按要求正确服用药物或注射胰岛的天数

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### 第四部分：自我一致性量表

指导语：

人们的自我认知能力能让个人在世上发挥作用。当人患有慢性病比如成人型糖尿病，人的自我认知的一致性可能受不同的影响。

下面是关于糖尿病患者的自我认知一致性的问答，请你圈出最代表你的感受的数字，比如1=从不，2=很少，3=有些时候，4=总是

<table>
<thead>
<tr>
<th>当我最近想到我自己时，我</th>
<th>从不</th>
<th>很少</th>
<th>有时</th>
<th>总是</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 花时间想我像什么样的人</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>2. 觉得自己是一个有价值的人，至少与别人一样有价值</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>3. 内视我是什么样的人</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4. 花时间想我是谁</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>5. 在社交聚会上感到紧张</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>6. 倾向于认为“我不好”</td>
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<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>7. 我能把事情做得和大多数人一样好</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8. 了解我是谁</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>9. 觉得我一点都不好</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>10. 思考我和别人说话时别人是怎么看我的</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
11. 觉得自己有很多问题
12. 我确信我知道自己是一个什么样的人
13. 如果我穿戴不适于场合，我会感到困扰
14. 花时间想我是哪种类型的人
15. 觉得我对自己认识混乱不清
16. 我知道自己是什么样的人
17. 对自己采取正面积极的态度
18. 我搞不清自己到底是什么样的人
19. 有些时候我为自己是什么样的人高兴有时候会不高兴
20. 总体来说我对自己满意
21. 我有时感到自己无能为力
22. 觉得我有一些好的品质
23. 我有时认为自己是这种人有时变成另一种人
24. 我觉得自己什么都不擅长
25. 我确认自己很好
26. 我一直知道自己是谁
27. 我常改变对自己的看法

第五部分:老年抑郁量表

1. 你对生活基本上满意么？
   ○是      ○否

2. 你是否放弃了许多活动和兴趣爱好？
   ○是      ○否

3. 你是否觉得生活空虚？
   ○是      ○否
4. 你是否常感到厌倦？
○是  ○否

5. #你是否大部分时间感觉精神好？
○是  ○否

6. 你是否害怕会有不幸的事落到你头上？
○是  ○否

7. #你是否大部分时间感到快乐？
○是  ○否

8. 你是否常感有无助的感觉？
○是  ○否

9. 你是否愿意呆在家里而不愿意去做些新鲜的事？
○是  ○否

10. 你是否觉得记忆力比大多数人差？
○是  ○否

11. #你是否认为现在活着很惬意？
○是  ○否

12. 你是否觉得像现在这样活着毫无意义？
○是  ○否

13. 你是否觉得精力充沛？
○是  ○否
14. 你是否觉得你的处境没有希望？
○是 ○否

15. 你是否觉得大多数人比你强得多？
○是 ○否