FACTORS INFLUENCING THE EATING BEHAVIOR OF PATIENTS WITH TYPE 2 DIABETES MELLITUS WITH POOR GLYCEMIC CONTROL IN WENZHOU, CHINA

JIALI JIANG

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR MASTER DEGREE OF NURSING SCIENCE
(INTERNATIONAL PROGRAM)
IN ADULT NURSING PATHWAY
FACULTY OF NURSING
BURAPHA UNIVERSITY
2025

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The Thesis of Jiali Jiang has been approved by the examining committee to be partial fulfillment of the requirements for the Master Degree of Nursing Science (International Program) in Adult Nursing Pathway of Burapha University

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This study aims to investigate eating behaviors and its influencing factors of type 2 diabetic patients with poor glycemic control. Using simple random sampling, 185 patients with type 2 diabetes mellitus with poor glycemic control were recruited from the Department of Endocrinology, the First Affiliated Hospital of Wenzhou Medical University, Wenzhou, China. Research tools included Demographic Record Form, Chinese Version of Diabetes Knowledge Scale, Chinese Version of type 2 diabetes Self-efficacy Scale, Social Support Rating Scale, Chinese Version of Adult Hypoglycemia Fear Questionnaire, and Eating Behavior Compliance Scale for type2 Diabetic Patients. Data analysis was performed using descriptive statistics and multiple linear regression analysis.

The results of this study showed that the average score of eating behavior in type 2 diabetic patients with poor blood sugar control was 75.25 (SD=14.72), indicating relatively moderate levels. The result also found that diabetic self-efficacy ($\beta = .402$, $p < .05$) and diabetes knowledge ($\beta = .171$, $p < .05$), which explained 21.30% of the variance in diabetic eating behavior (Adjusted $R^2 = .213$, $p < .05$). Clinical nurses can help patients with type 2 diabetes with poor glycemic control enhance their eating behaviors by improving their diabetic self-efficacy and diabetes knowledge.

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Jiali Jiang

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CHAPTER 1
INTRODUCTION

Background and significance of the research problem

Diabetes mellitus is a kind of metabolic disease that is difficult to cure and seriously affects human health. It is characterized by elevated blood glucose, which is caused by the production and/or utilization disorders of insulin, usually manifested as hyperglycemia, polyuria, polydipsia and polyphagia (Kim, 2019). The global prevalence of diabetes among people aged 20-79 was estimated to be 10.5% (536.6 million people) in 2021, which rose to 12.2% (783.2 million people) by 2045. High-income countries (11.1%)were higher than low-income countries (5.5%). Between 2021 and 2045, middle-income countries (21.1%) were projected to experience the largest relative increases in diabetes incidence, while high-income countries (12.2%) and low-income countries (11.9%) were projected to experience the largest relative increases. Global diabetes-related health spending was estimated at $966 billion in 2021 and was projected to reach $105.4 billion by 2045 (Sun et al., 2022).
The prevalence of diabetes in China was still increasing, it reached 11.2% from 2015 to 2017, with great differences among ethnic groups and regions. Type 2 diabetes accounted for more than 90% of the diabetic population. Awareness (36.5%), treatment (32.2%) and control (49.2%) rated of diabetes have improved but remain low (Zhu, 2021). According to the latest data released by the International Diabetes Federation (IDF), as of 2021, there will be as many as 537 million people with diabetes worldwide, and about 6.7 million people will die of diabetes throughout the year (Chivese et al., 2022).

The biggest problem with type 2 diabetes was poor blood sugar control. High frequencies of poor glycemic control for type 2 diabetes, defined by HbA1C thresholds of 6.5% (48 mmol/ mol) or 7.0% (53 mmol/mol), have been reported across regions around the world (Camara et al., 2015). In China, the goal of blood sugar control was HbA1C less than 7%, so if HbA1C is greater than 7%, it means that blood sugar control is not good (Zhu, 2021). Chinese patients with type 2 diabetes generally had poor glycemic control. The survey 348 patients with type 2 diabetes

showed that the overall blood sugar control of patients with type 2 diabetes was not up to standard, and the average HbA1c was 7.9±2.0% (Cai & Hu, 2017). Poor glycemic control in patients with T2DM was a major public health problem and an important risk factor for the progression of diabetic complications. Glycemic control remained the primary therapeutic goal to prevent organ damage and other complications from diabetes (Koro et al., 2004). Studies have also reported that poor glycemic control may increase the care needs of people with diabetes, increase related medical costs, and may develop various complications (Ali et al., 2012). Poor glycemic control will lead to a series of complications, on the contrary, good blood glucose control can reduce the occurrence of complications. Chronic complications of diabetes include microvascular and macrovascular complications. Microvascular complications include neuropathy, nephropathy and retinopathy. Macrovascular complications include cardiovascular disease, stroke and peripheral artery disease (Papatheodorou et al., 2018). Acute complications of diabetes include diabetic ketoacidosis, diabetic hyperosmosis and hypoglycemia. Glycated hemoglobin (HbA1c) is the most important indicator of blood sugar control, decreased HbA1c levels are closely associated with decreased microvascular complications in diabetic patients HbA1c reduction from 10% to 9% had a greater effect on the risk of complications from 7% to 6% (Zhu, 2021). A large number of studies have shown that through the effective control of blood glucose indicators, patients can minimize the probability of complications, which has a good role in promoting the reasonable guarantee of their quality of life (Liu & Sun, 2020).

The factors associated with glycemic control including the age, gender, marital status, living status, education, occupation, income, family history of diabetes, diabetes association members, the types of diabetes, diabetes duration, the types of drugs, body mass index, physical training, knowledge and attitudes of insulin self-management, adhere to the diet and medication, follow-up, self-monitoring of blood glucose levels and family support (Yosef et al., 2021). Eating behavior was one of the important factors affecting glycemic control. Eating behavior not only includes the choice of food type, source, intake, but also includes eating speed, time, and eating habits. Eating behaviors affect the metabolism of insulin, which affects the fluctuation of blood sugar. A study of eating habits and blood sugar control in eastern Nigeria

found that choosing a variety of carbohydrates led to better blood sugar control than choosing a single carbohydrate source (Ntui et al., 2006). Whole grains and oil intake fully or partially modulates the effect of health guidelines on blood sugar control (Lin et al., 2021). Moreover, in order to improve the glucose management ability of diabetic patients and prevent and delay the occurrence of complications, the "five carriages" of drugs, diet, exercise, blood glucose monitoring and education should be used comprehensively. Among them, dietary control was one of the measures for diabetes management, which was also the most challenging part (Evert et al., 2014). Because the occurrence and development of diabetes was closely related to dietary factors, unhealthy diet was the main risk factor for type 2 diabetes, obesity and other diseases (Yang et al., 2005). Results of a study suggested that in eating behaviors, high frequency of skipping breakfast and fast eating in men and the elderly increase the risk of poor glycemic control in the current population (Iwasaki et al., 2019). Therefore, reasonable diet played an important role in the effective control of blood glucose.

Conversely, poor eating behavior can lead to poor glycemic control (Liu et al., 2018). Another studies also shown that the management of eating behavior was related to blood glucose control (Pamungkas et al., 2017). Poor eating behavior of patients with type 2 diabetes was common, and the reasons were complex, which seriously affected the metabolic status of patients, resulted in insignificant clinical treatment effect, and even relapsed of the disease (Ben, 2020). Poor eating behavior in diabetic patients is harmful to blood glucose control, and the failure of long-term blood glucose control is the main cause of chronic complications (Zhang et al., 2007). This is because proper diet can reduce the load of beta cells and help control blood sugar levels (Association, 2014). By correcting the diet, it is helpful to reduce the daily intake of sugar, which is very important for the recovery of the patient's body function and the protection of various major organs (Wang et al., 2019). Therefore, we studied the influencing factors of the eating behavior of patients with type 2 diabetes would help to influence these factors through nursing intervention, so as to improve the eating behavior of patients, to control the blood sugar of patients, and reduced the occurrence and deterioration of complications.

There are many factors that influence the eating behaviour of patients with type 2 diabetes who have poor glycemic control. According to several studies, in terms of physiological factors, gender, age, course of disease, and complications can affect eating behaviour. In terms of psychological factors, self-efficacy and depression level can affect eating behaviour. In terms of personal characteristics, education level, economic income, fear of hypoglycemia, and diabetes knowledge can influence eating behaviors. In terms of interpersonal interactions, social support influenced eating behavior. A study in people with type 2 diabetes showed that people with low self-efficacy levels were significantly lower than those with high self-efficacy levels in adhering to a medically controlled diet, regular and quantitative meals, and weighing each meal (Ge et al., 2007). There was a certain relationship between patients' diabetes dietary knowledge and their eating behaviors. The better the dietary knowledge, the better the eating behaviors (Tao et al., 2014). People with low social support had significantly lower compliance rates than those with high social support, such as adherence to controlled diet, regular and quantitative meals, weighing food at each meal and using food exchange portions to arrange daily meals (Ge et al., 2007). Good social support can reduce patients' psychological distress symptoms, stimulate patients to face the disease with a positive and optimistic attitude, and actively seek help related to problems from the outside world, and form habits and behaviors conducive to promoting and maintaining health (Ge et al., 2020). The fear of hypoglycemia easily leads to anxiety, depression, pain, depression and other negative emotional experiences of patients, making them worry and disappointed about the treatment effect, and then adopt avoidance behavior, give up standardized self-management, and then change their eating behavior (Huang et al., 2018). Therefore, hypoglycemic fear can negatively affected glycemic control in T2DM patients (king et al., 2018).

Although there were many studies on the influencing factors of diabetic eating behavior in China, there were few in-depth researches on the specific factors. For example, the effect of hypoglycemia fear on the eating behavior of patients with type 2 diabetes. Previous studies in China focused on analyzing the influencing factors of patients' dietary compliance, and most of the studies had a relatively small sample size, only about 100. In addition, most of the previous studies were carried out

in specific age and specific location populations, such as young and middle-aged diabetic patients, and elderly diabetic patients in the community, which did not represent all adult type 2 diabetic patients. Previous study populations included patients with good glycemic control, and their eating behavior was biased from patients with poor glycemic control. This study focused on patients with type 2 diabetes with poor glycemic control, excluded some patients with good glycemic control, and will study in adults with diabetes rather than specific ages. The sample size of this study nearly reached 200, which was larger and more convincing than previous studies. The purpose of this study was to describe eating behaviors of people with type 2 diabetes mellitus with poor glycemic control in Wenzhou, and to analyze the factors affecting eating behaviors. The result of this research can provide the basis for nursing intervention.

Objectives of the study

1. To explore eating behaviours among people with type 2 diabetes having poor glycemic control in Wenzhou

2. To examine factors influencing eating behaviours among people with type 2 diabetic having poor glycemic control in Wenzhou.

Research hypothesis

Social support, fear of hypoglycemia, diabetes knowledge, self-efficacy could predict eating behaviours among type 2 diabetic patients with poor glycemic control.

Scope of research

This purpose of this predictive cross-sectional study was to examine the factor influencing eating behavior of patients with poor glycemic control in type 2 diabetes in Wenzhou, China. The sample were adults with type 2 diabetes with poor glycemic control who follow up at the endocrinology outpatient department of the First Affiliated Hospital of Wenzhou Medical University, Wenzhou City, Zhejiang Province, China. The sample size was 185. The data collection period was from October 1st to December 1st, 2022.

Conceptual framework

The conceptual framework of this study was developed based on the Pender's Model of health promotion (Pender et al., 2011) and research evidence. Concepts in Pender's health promotion model include individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Personal characteristics and experiences include previously relevant behavioral and personal factors, and include biological, psychological, and sociocultural. Behavior-specific affects include perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences and situational influences. Interpersonal influences include family, peers, providers, norms, support, models. Situational influences include options, demand, characteristics and aesthetics. Behavioral outcomes include commitment to a plan of action, immediate competing demands (low control) and preferences (high control), health promoting behavior. The structure of HPM has been identified as an important determinant of physically active behaviour and has been tested by health professionals (Teymouri et al., 2007).

Fear of hypoglycaemia is an adverse emotional experience caused by the threat of hypoglycemia and its associated behavioral changes (Cox et al., 1987). Psychological factors belong to the individual factors in the theoretical model. Fear of hypoglycaemia can lead to “hypoglycemic avoidance behaviors.” This fear may adversely affect diabetes management and glycemic control (Kaya & Toklu, 2022). Patient knowledge is a great tool to help people with diabetes in their treatment, giving them a better understanding of diabetes, which can affect their eating behavior. In addition, changing the behavior will be able to control the condition of the disease, so that they can survive longer and have an increasingly better quality of life (Sari et al., 2021). Diabetes knowledge is a sociocultural factor within individual factors in Pender's model of health promotion theory. It was suggested that knowledge of diabetes had a positive impact on the eating behavior of people with diabetes by changing the sociocultural factors in individual quotes to promote behavioral change. Because diabetes is a chronic disease that requires extensive behavior change and adherence to a complex diet, social support is considered one of the important influencing factors for self-care and adherence to treatment and disease control (Trief et al., 2004). Social support belongs to individual socio-cultural factors in the

theoretical model. In the health promotion model, Pender considered family support as interpersonal influence which can predict health improvement behaviors. Thus, social support, especially family support, can be a vital component in the successful control of diabetes. A study also demonstrated that both general social support and diabetes-related support were associated with adherence to self-care behaviors in people with diabetes (Rad et al., 2013). Self-efficacy in Pender's theoretical model belongs to the perceived self-efficacy that affects the prior related behavior. Improving self-efficacy can extend life expectancy and regulate health behaviors (Bentsen et al., 2010). Patients' self-efficacy regarding their ability to perform their own activities is the significant predictor of their behaviors (Mohamadinejad et al., 2015). The higher the self-efficacy had the fewer barriers to eating behavior. Self-efficacy was related to positive emotions. When positive emotions and eating behaviors were linked, the likelihood of commitment and action increases, so self-efficacy had a positive effect on eating behaviors.

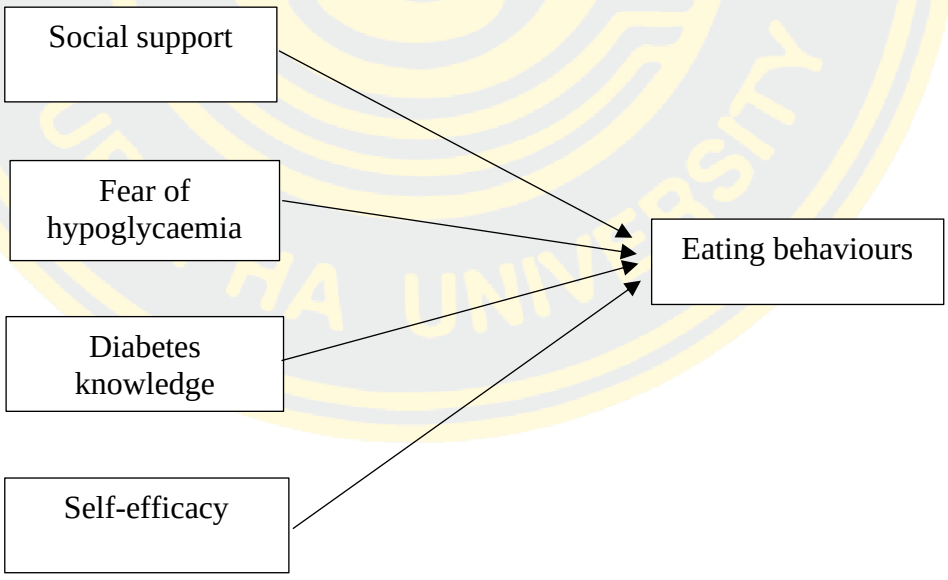

Figure 1 Conceptual framework

Definition of terms

Eating behavior encompasses food choice and motives, cooking and eating habits, feeding practices, and dietary self-control. It was measured with the Eating Behavior Compliance Scale for Type 2 Diabetic Patients (Zhao et al., 2017).

Social support refers to the perception toward subjective, objective, and utilization of diabetic patients received from family, friends, and health care provider. This variable was measured with the Social Support Rating Scale (SSRS) (Xiao, 1994).

Fear of hypoglycemia refers to the perception and concerns related to hypoglycemia including some behaviors of diabetic patients to avoid hypoglycemia and the consequences of hypoglycemia and worry of diabetic patients because of the fear of hypoglycemia, and it is measured using the Chinese version of the Hypoglycemia Fear Inventory (CHFSII) (Mu, 2015).

Diabetes knowledge refers to facts and information related to diabetes mastered by diabetic patients including diet, treatment, medication, foot care, exercise, influence of smoking/drinking, complications, hypoglycemia. This variable was tested using the Chinese version of the Diabetes Knowledge Scale (Zhu, 2010).

Self-efficacy refers to the judgment and confidence of diabetic patients in their ability to monitor, plan and carry out activities of daily living with diabetes. It is composed of diet management self-efficacy, exercise management self-efficacy and disease control self-efficacy, and is measured with the Chinese version of the Diabetes Self-efficacy Scale (Sun, 2010).

Poor glycemic control refers to patients with type 2 diabetes with a glycated hemoglobin greater than or equal to 7%.

CHAPTER 2
LITERATURE REVIEW

In this chapter, the researchers reviewed existing articles on the current status of glycemic control in type 2 diabetes and the influencing factors of eating behavior in type 2 diabetes. Literature sources included Baidu Scholar, Google Scholar, web of science, PubMed, CNKI, sci-hub. There were also relevant data from the International Diabetes Federation. The searched keywords were type 2 diabetes, blood sugar control, eating behavior, influencing factors, current situation survey.

This chapter briefly introduced the status quo of Type 2 diabetes in China, the concept, and characteristics of eating behavior, and the factors influencing the eating behavior of type 2 diabetes patients with poor glycemic control. The literature review divided into the following sections:

1. Overview of Type 2 DM with poor glycemic control
2. Eating behaviors of patients with Type 2 DM
3. Theory related to eating behaviors of Type 2 DM
4. Factors affecting eating behaviors of Type 2 DM
5. Summary of the relationship between factors and eating behaviors of DM

Overview of Type 2 DM with poor glycemic control

Over the past 30 years, the prevalence of diabetes in China has increased significantly. In 1980, the epidemiological data of 300,000 people in 14 provinces and cities across the country showed that the prevalence of diabetes was 0.67%. From 2007 to 2008, the results of the epidemiological survey of diabetes in 14 provinces and cities nationwide organized by the Diabetes Branch of the Chinese Medical Association showed that the prevalence of diabetes in adults aged 20 and above in my country was 9.7%. Moreover, T2DM accounts for more than 90% of the diabetic populations in China and it becomes the world's one of the fastest growing diabetes rates in the world (Zhu, 2021). Studies have shown that the prevalence of diabetes in Chinese children and adolescents is 1.73‰ (Dong et al., 2016). Therefore, most of the

diabetic patients in China are adults, so this study focuses on the adult type 2 diabetic patients.

The characteristics of Chinese type 2 diabetes population must be considered in the study of eating behavior of Chinese type 2 diabetes patients. The 2020 edition of the Chinese guidelines for the prevention and treatment of type 2 diabetes summarizes the characteristics of the Chinese type 2 diabetes population.1) There are more men with type 2 diabetes than women. 2) There are differences in the prevalence of each ethnic group. 3) Type 2 diabetes patients in economically developed areas are higher than those in moderately developed and underdeveloped areas. 4) Urban type 2 diabetes patients are redundant in rural areas. 5) The proportion of newly diagnosed type 2 diabetes is high. 6) Awareness, treatment and control of type 2 diabetes have improved, but are still at a low level, more pronounced in rural areas. 7) Increased prevalence of type 2 diabetes in obese and overweight people. 8) The prevalence of diabetes in China over the age of 60 has increased (Zhu, 2021).

A study revealed that in patients with type 2 diabetes, HbA(1c) levels were associated with lower risks of macrovascular events and death down to a cutpoint of 7.0% while microvascular events down to a cut point of 6.5% (Zoungas et al., 2012). Poor blood sugar control in people with type 2 diabetes is a major public health problem and a major risk factor for the development of diabetes complications. Blood glucose control remains the primary therapeutic goal for preventing target organ damage and other complications caused by diabetes (Koro et al., 2004). Chronic poor glycemic control can lead to elevated HbA1C levels (Association, 2021),which can increase cardiovascular risk (Boden-Albala et al., 2008). Poor glycemic control was associated with a higher risk of complications: every 1% increase in HbA1C above a threshold level (7%) was associated with a 38% increase in macrovascular events such as cardiovascular disease (Association, 2021).

A study showed that increasing BMI, residential status as urban, illiteracy and increasing disease duration were found to have significant association with poor glycemic control (Ali et al., 2022).Another study showed that BMI and medication adherence were associated with poor blood sugar control (Abebe et al., 2022).
In the other side, increased age, high LDL cholesterol, family history of diabetes, being single, female, diabetic peripheral neuropathy, and alcohol consumption were

significantly associated with poor glycemic control (Abdissa & Hirpa, 2022). In addition, insufficient physical exercise and non-adherence to the use of anti-sugar drugs are also reasons for poor blood sugar control (Legese et al., 2023).

The occurrence and progression of diabetes is closely related to dietary habits, and unhealthy diet is considered to be a major risk factor for diabetes (Vergès, 2009). Dietary habits are a major factor in the rapidly rising incidence of diabetes in developing countries, according to a literature review (Sami et al., 2017). For instance, many studies report that high sugar intake is positively associated with the development of type 2 diabetes (Khatib, 2004). Evidence suggests a link between soft drink consumption and obesity and diabetes, due to the high use of high fructose corn syrup in the manufacture of soft drinks resulting in dangerous levels of blood sugar and BMI (Nseir et al., 2010).

To study the eating behavior of Chinese patients with type 2 diabetes, it is necessary to take into account the social and cultural characteristics of China. Since China is a big agricultural country, the development of agricultural economy has made the Chinese people's diet consist of grains as the main food, vegetables, and meat as the supplementary food. Among the staple foods, there are differences between the North and the South of China, but they are all dominated by refined carbohydrates such as rice and noodles, and both the north and the south like to eat buns, noodles, dumplings, and rice made of flour as the staple food for three meals. Most Chinese people like to eat fried food. Chinese people are warm and hospitable. They like big banquets, which are prone to overeating and drinking too much and affecting blood sugar control among people with type 2 DM.

Wenzhou is a coastal city in southern China, rich in products and diverse in diet. Wenzhou is a city that pays great attention to etiquette, big and small festivals like feasting, drinking and eating. Wenzhou people like to eat rice and seafood. Wenzhou people live a fast-paced life, and many young people do not like to cook at home and prefer to eat fast food. These dietary cultures and characteristics have a certain correlation with the dietary behaviors of diabetic patients.

Eating behaviors of patients with Type 2 DM

Eating behavior is a broad term that encompasses food choice and motives, feeding practices, dieting, and eating-related problems such as obesity, eating disorders, and feeding disorders. With the context of behavioral medicine, eating behavior research focuses on the etiology, prevention, and treatment of obesity and eating disorders, as well as the promotion of healthy eating patterns that help manage and prevent medical conditions such as diabetes, hypertension, and certain cancers (LaCaille, 2020). Eating behavior includes not only food choices, but also food preferences and eating behaviors related to consumption behaviors. A proper diet can reduce the burden on islet beta cells and give islet tissue a chance to recover (Huang et al., 2004). Eating behaviors in this study refer to the choices and motivations of people with diabetes towards food, as well as their eating-related behaviors.

The Chinese Diabetes Association proposed that the reasonable eating behavior of diabetes is: 1) It is necessary to achieve and maintain the ideal body weight, but also to meet the needs of energy. 2) For obese and overweight diabetic patients, the intake of total capacity should be controlled. Lifestyle adjustments should be made to control total energy intake and lose at least 5% of body weight. 3) Appropriately low-carbohydrate diet, choose carbohydrates with low glycemic index. 4) Meals should have fixed mealtimes and fixed meal sizes. 5) Increase the intake of dietary fiber is the recommended amount of carbohydrates in the diet of most people with diabetes. Diabetes with poor postprandial blood sugar control, Patients, the energy supply ratio of carbohydrates can be appropriately reduced. Energy accounts for 50%~65% of the total energy. Diabetic patients with poor postprandial blood glucose control can appropriately reduce the carbohydrate energy ratio.A very low carb diet is not recommended for the long term. Low glycemic index carbohydrates should be selected to control the total amount of carbohydrates. Non-starchy vegetables, fruits and whole grains can be appropriately increased, and the intake of refined grains can be reduced. 6) Strictly control sucrose and fructose products. Diabetic patients with sweet teeth can take in sugar alcohol and non-nutritive sweeteners appropriately.7) Daily intake of high-quality protein. For diabetic patients with normal renal function, the recommended energy supply ratio of protein is 15% to 20%, and it is ensured that high-quality protein accounts for more than half of the

total protein. In diabetic patients with overt proteinuria or decreased glomerular filtration rate, protein intake should be controlled at 0.8 g/kg body weight per day. 8) It is not recommended for patients to drink alcohol. If drinking alcohol, the total energy of the alcohol should be calculated to avoid drinking on an empty stomach. Be alert to alcohol-induced hypoglycemia, especially in patients taking sulfonylureas or injecting insulin and insulin analogs, avoid drinking on an empty stomach and strictly monitor blood sugar.9) Limit salt intake to within 5G per day. At the same time, you should limit the intake of foods high in salt, such as monosodium glutamate, soy sauce, salt-soaked and other processed foods, and seasoning sauces.10) Appropriately supplement trace elements. 11) Specific dietary patterns, such as Mediterranean diet, vegetarian diet, are not recommended (Zhu, 2021)

Theory related to eating behaviours of diabetes mellitus

Eating behaviors are complex because people make many daily dietary decisions that are influenced by a variety of personal, social, cultural, environmental, and economic factors. What and how much people eat has a considerable impact on their health (LaCaille, 2020). Eating behavior is the important aspect in both health promotion and health prevention in people with type 2 DM. Therefore, it is a great significance to study the impact of dietary behavior on health. A health promotion model (Pender et al., 2011) was used to guide this study.

Health promotion is defined as behavior motivated by the desire to enhance well-being and realize human health potential. It is to achieve the purpose of promoting health by changing the original unhealthy behavior pattern. This health promotion model is divided into three parts, namely individual characteristics and experiences, behavioral-specific cognitions and affect, and behavioral outcomes. Among the four influencing factors in this study, social support comes from the interpersonal influence in the model. The fear of hypoglycemia arises from the psychological factors of personal factors in the model. Diabetes knowledge is derived from sociocultural factors among personal factors in the model. Self-efficacy is derived from the perceived self-efficacy in the model.

This study is to analyze the influencing factors of eating behavior in type 2 diabetes mellitus. According to the health promotion model (Pender et al., 2011), its

components include personal factors, including physical, psychological, and sociocultural factors, as well as cognitive and affective and interpersonal relationships that influence specific behaviors. The fear of hypoglycemia comes from the psychological factors in the personal factors in the model, and the knowledge of diabetes comes from the social and cultural factors in the personal factors in the model. Self-efficacy is derived from the perceived self-efficacy in the model. Social support comes from interpersonal influences in the model. Finally, the health promotion model identifies the influencing factors of dietary behavior in patients with type 2 diabetes and provides a basis for the analysis and evaluation of these factors. This focuses on health promotion and disease prevention.

Factors affecting eating behaviors among type 2 diabetes mellitus

The several major influencing factors of eating behaviors among type 2 diabetes mellitus with poor glycemic control include social support, hypoglycemia fear, diabetes knowledge and self-efficacy.

Fear of hypoglycemia

Negative consequences and unpleasant experiences associated with hypoglycemia may lead to significant anxiety or fear of hypoglycemia in diabetics, and there may also be other psychological manifestations associated with the continued threat of hypoglycemia, such as chronic anxiety (Fidler et al., 2011). There is still no uniform and standardized definition of the concept of hypoglycemic fear. Gjerløw et al. (2014) defined fear of hypoglycemia as the degree of fear related to hypoglycemic episodes and their negative consequences, including the fear of health damage caused by hypoglycemia and the fear of behavioral, motor and cognitive changes during hypoglycaemia.

Fear of hypoglycemia refers to the worry and behavior of diabetics due to the fear of hypoglycemia. Including some behaviors of diabetic patients to avoid hypoglycemia and the consequences of hypoglycemia and worry of diabetic patients because of the fear of hypoglycemia, and it is measured using the Chinese version of the Hypoglycemia Fear Inventory (CHFSII) (Mu, 2015).

Fear of the occurrence of hypoglycemia and the consequences of hypoglycemia, some adverse psychological effects occur, thus affecting eating

behavior. When patients with type 2 diabetes have hypoglycemia, they will have uncomfortable physical symptoms, which will make them lose confidence in the treatment and control of blood sugar, and thus take a negative way of coping, resulting in poor eating behavior. It is also possible that the fear of hypoglycemia can easily lead to anxiety, depression, pain, depression and other adverse emotional experiences in patients, causing them to worry and be disappointed with the treatment effect, and then adopt avoidance behaviors, abandon standardized self-management, and then make eating behaviors worse(OR=1.534, P < 0.001) (Zhu, 2021). The patients with hypoglycemia would become sensitive, cautious, avoid, and compromise due to the fear of hypoglycaemia, which includes vigilant snacking, drug sensitivity, and over-response behaviors, and caution includes two behaviors, striving to stabilize blood sugar and essential food (Xu et al., 2019). There are many patients with hypoglycemia fear, in order to avoid hypoglycemia, they will change their eating behaviors to maintain high blood sugar levels, such as overeating to prevent hypoglycemia, these behaviors can lead to chronic hyperglycemia (Gonder-Frederick, 2013). A large number of studies have shown that hypoglycemia fear and eating behavior are negatively correlated, that is, the stronger the hypoglycemia fear, the worse the eating behaviour(β =-0.563, p <.01) (Jin et al., 2021; Zhu, 2021). Fear of hypoglycemia negatively affects glycemic control in T2DM patients (Wang et al., 2018). Patients' Hypoglycemia Fear Survey II-Worry Scale scores is negatively correlating with their eating behavior compliance (β =-0.326,P < .001) (Ge et al., 2020). Another study also showed that all dimensions of type 2 diabetes eating behavior were negatively correlated with all dimensions of the Hypoglycemia Fear and Anxiety Scale (Gu, Lv， Su, et al., 2019). When patients have hypoglycemia fear, common strategies are to change food intake, such as overeating to prevent hypoglycemia or correct hypoglycemia that has already occurred (Martyn-Nemeth et al., 2017). Thereby changing eating behavior, making eating behavior worse. In conclusion, the fear of hypoglycemia could be negatively predicted diabetic eating behavior.

Diabetes knowledge

The American Diabetes Association has determined that knowledge of diabetes forms the basis for informed decisions about diet, exercise, weight control, blood glucose monitoring, medication use, foot and eye care, and macrovascular risk factor control (Murata et al., 2003). At present, diabetes knowledge includes general diabetes knowledge, diet treatment knowledge, exercise knowledge, drug knowledge and self-detection knowledge (Yanyan, 2014).

Diabetes knowledge refers to the information related to diabetes mastered by diabetic patients, including diet, treatment, medication, foot care, exercise, influence of smoking/drinking, complications, hypoglycemia. This variable was tested using the Chinese version of the Diabetes Knowledge Scale (Zhu, 2010).

Knowledge of diabetes is a social and cultural factor among individual factors. The better patients have knowledge of diabetes and the deeper their knowledge of the disease, the better they can be guided to implement behaviors of controlling blood sugar, including eating behaviors. They will know how many calories they consume every day and which foods they should not eat more, so as to guide their eating behaviors.

The level of awareness and knowledge about diabetes is an important factor in changing population behavior and increasing opportunities for participation in any disease prevention and control program (Holla et al., 2014). Lack of knowledge about diabetic diet is the main reason why patients cannot follow the diet. They believe that drug therapy alone can make blood sugar reasonably controlled, especially for patients with low education level (Cailing et al., 2011). The better the knowledge of diabetes, the better the patient's eating behavior. Studies have shown that the level of dietary nutrition knowledge of diabetic patients directly affects the patients' eating habits and behaviors, and can also affect their attitudes and behaviors in the treatment of the disease（$p < .01$) (Zhao et al., 2007). A study in a low-income minority population showed that knowledge of diabetes affects glycemic control by influencing patients' self-care behaviors, including eating behaviors (Holla et al., 2014). This means that the more you know about diabetes, the less likely you are to have no self-control of your blood sugar levels.($OR=0.87$, $p < .01$)(Vander Heide et al., 2014) A study on type 2 diabetes health knowledge and treatment adherence showed that

patients' diabetes knowledge was a major influencing factor of treatment adherence, including adherence to dietary treatment behaviors (P < .01) (Zheng et al., 2007). The results of another study pointed out that the higher the knowledge of diabetes diet, the more helpful it is to change the bad eating behavior(p < .01）(Jin et al., 2021). Because the formation of healthy behavior habits depends on the individual's health knowledge reserve (Yang et al., 2020). Knight et al. Point out that knowledge and behavior have a certain quantitative relationship, and knowledge is a necessary condition for behavior and behavior change (Knight et al., 2006). In conclusion, diabetes knowledge could be positively predicted diabetic eating behavior.

Self-efficacy

Self-efficacy, which is “a judgment of one’s ability to carry out a particular course of action” (Pender et al., 2011). Self-efficacy refers to an individual's subjective judgment of his ability to perform a particular behavior, that is, an individual's confidence in his ability to perform a particular behavior and achieve the expected result (Liu, 2005). For people with diabetes, self-efficacy was defined as judgments of one’s own capability to monitor, plan, and carry out diabetes activities of daily living (Hurley & Shea, 1992).

Self-efficacy refers to the judgment and confidence of diabetic patients in their ability to monitor, plan and carry out activities of daily living with diabetes. It is composed of diet management self-efficacy, exercise management self-efficacy and disease control self-efficacy, and is measured with the Chinese version of the Diabetes Self-efficacy Scale (Sun, 2010).

The perceived ability or self-efficacy to perform a given behavior increases both commitment to the action and the likelihood of actual performance of the behavior. The higher the self-efficacy creates the fewer barriers to specific health behaviors. Positive affect about a behavior leads to greater self-efficacy, which in turn leads to an increase in positive affect. Thus, self-efficacy and eating behavior were positively correlated. The greater and stronger the self-efficacy an individual possesses. The greater the positive impact of persistence and effort on behavior.(Ma, 2007)

Bandura believes that self-efficacy is the strongest predictor of individual behavioral change, and generally those who show the highest behavioral change have higher self-efficacy (Bandura, 1977). Studies have shown that dietary control behaviors in patients with type 2 diabetes are positively correlated with self-efficacy, and self-efficacy is a decisive factor in dietary control behaviors. It is shown that high self-efficacy can prompt patients to strictly implement dietary control ($r = .543$, $p < .05$) (Wen et al., 2012). Bandura believes that the behavioral process is derived from the cognitive process, and self-efficacy affects the individual's behavioral goals, thinking patterns, personal motivation and the way of dealing with difficulties and setbacks, that is, it has a great impact on the individual's initiation and persistence (Bandura et al., 1999). Research by Ge Xiaotian et al. shows that self-efficacy is one of the influencing factors of eating behavior in patients with type 2 diabetes($p<.01$) (Ge et al., 2007). Another study showed that the eating behavior of patients with type 2 diabetes was influenced and played a decisive role by self-efficacy. They are positively correlated, indicating that good self-efficacy can promote strict control of eating behavior in patients($r =-.82$, $p<.01$) (Wang & Liu, 2002). A study found that people with high self-efficacy were more likely to adopt healthy eating behaviors (Om et al., 2013). Therefore, a scholar put forward that self-management by enhancing patient confidence, improving self-efficacy, and encouraging self-decision in the treatment of chronic diseases (Tattersall, 2002). In conclusion, self-efficacy could be positively predicted diabetic eating behavior.

Social support

Social support is defined as resources provided by others (Cohen & Syme, 1985), which refers to the subjective support, objective support and support utilization of diabetic patients from official and semi-official organizations such as spouses, parents, children, siblings, colleagues, friends, neighbors, relatives, work units, party groups and trade unions. It consists of subjective support, objective support and social support utilization. This variable was measured with the Social Support Rating Scale (SSRS) (Xiao, 1994)

A major part of diabetes care is done at home and within the family (Shaw et al., 2006), and diabetes is sometimes called a family disease because its control and demands affect all family members.(La Greca & Bearman, 2002). Therefore, social

support is an important part of good blood sugar control, and good blood sugar control is the most important improvement in eating behavior, which requires material and spiritual support and help from the family.

Social support is an interpersonal factor in theoretical models of health promotion, including family, friends, colleagues. The theory states that family, peers, and health care providers are important sources of interpersonal influence that can increase or decrease commitment and participation in health-promoting behaviors. Good social support can reduce the symptoms of psychological distress in patients, inspire patients to face the disease with a positive and optimistic attitude, and actively seek help from the outside world, and form habits and behaviors that are conducive to promoting and maintaining health. The more social support a patient obtains, the more helpful it is to maintain a positive and optimistic attitude, gain disease management experience by participating in family and social activities, improve self-management ability, and improve dietary compliance (Meng & Ma, 2019). Good social support has a positive effect on promoting individuals to change unhealthy behaviors (Guo et al., 2014). Studies have shown that subjective support in social support can promote patients' eating behaviors to change in a better direction（P<.05） (Yan et al., 2018). One study showed that people with diabetes who had good eating behavior had better social support than those who had poor eating behavior (p<.05). Social factors such as self-adjustment, family and friends, medical staff and community groups directly penetrate into all aspects of patients with type 2 diabetes, which can directly affect the eating behavior of patients(p< . 001) (Peiru, 2021). However, another study showed that family support in social support did not predict eating behavior in diabetes, possibly because there was little family support in reminding to control portion sizes, buy food, and choose restaurants (β=0.14, p>0.05) (Om et al., 2013). This may be related to the family environment in a specific region, and the relationship between the participants and the family. In conclusion, social support could be positively predicted diabetic eating behavior.

Summary

A literature review shows that there are many factors affecting the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control. Through the theoretical model of health promotion, fear of hypoglycemia has

negatively predicted eating behaviour. Diabetes knowledge, self-efficacy and social support have positively affected eating behavior.

CHAPTER 3
RESEARCH METHODOLOGY

A cross-sectional quantitative research approach was used to examine the eating behaviors and its factors among people with type 2 diabetes with poor glycemic control in Wenzhou. This chapter presents study setting, population, sampling method, sample, data collection procedure, protection of human subjects, and data analysis.

Research Design

A predictive cross-sectional design was used to study the eating behavior of Wenzhou patients with type 2 diabetes with poor glycemic control, and to examine the relationship between self-efficacy, social support, diabetes knowledge, fear of hypoglycemia and eating behavior.

Setting of the study

This study was conducted in the Endocrinology Department of the First Affiliated Hospital of Wenzhou Medical University. Since the department receive an average of 10,000 patients with type 2 diabetes in one month, a sufficient sample size could be collected in one month. The hospital is a tertiary first-class general hospital in Zhejiang Province. The endocrinology department of the hospital is one of the first national standardization management centers for metabolic diseases (MMC) in China, and is an important basic and clinical research base for endocrine and metabolic diseases in Zhejiang Province. Three-quarters of the patients who visit the endocrinology clinic every month are diabetic, and more than 90% are type 2 diabetes.

Population and Sample

Population

The study population was adults with type 2 diabetes with poor glycemic control who presented to the outpatient department of endocrinology of the First

Affiliated Hospital of Wenzhou Medical University, Wenzhou City, Zhejiang Province, China. About 6000 patients with type 2 diabetes go to clinic every month.

Sample

The sample consisted adults with type 2 diabetes with poor glycemic control and were receiving treatments at the hospital under the jurisdiction of the endocrinology outpatient department of the First Affiliated Hospital of Wenzhou Medical University, Wenzhou City, Zhejiang Province, China.

The inclusion criteria of the sample include:

1. Participants age are between 18-60 years old, conscious, and have no mental disorders or severe physical activity impairment (from medical record).

2. Clinical diagnosis of type 2 diabetes with poor glycemic control (HbA_1C > 7%) (Zhu, 2021)

3. Type 2 diabetes patients treated with oral medication, insulin therapy and combination therapy with oral medication and insulin.

4. Have a certain ability to write and can speak Chinese

Sample size

The sample size was calculated using G*Power3.1 software. Using F tests. Using a conventional power estimate of 0.95, with alpha level set at 0.05, and effect size of 0.10 (Shin et al., 2022). Using multiple linear regression for analysis, the number of predictors was 4. The calculated sample size was 191.

Sampling technique

This study used simple random sampling for data collection. The participant lists were obtained from the computer system of outpatient patients who signed in every day at the endocrinology clinic of the First Affiliated Hospital of Wenzhou Medical University. Then researcher randomly selected without replacement 5-10 eligible participants from the list of patients who met the inclusion criteria and received service on Monday to Friday at 8:00-12:00 am and 14:00-17:00 PM.

Research instruments

1. The Demographic Data Record

The content consisted of two parts. The first part was based on the patient's subjective filling of the questionnaire. The items included gender, age, course of disease, education level, marital status, residence, economic income, clinic diagnosis, height, weight, BMI. The following information was obtained from the hospital computer system with the patient's consent: recent glycated hemoglobin level, recent fasting blood glucose, number of complications, therapy method.

2. Chinese Version of Diabetes Knowledge Scale was used to study the degree of knowledge mastery of diabetic patients. The diabetes knowledge scale developed by Speight and Bradley (2001) of University of London in 2001. It was translated by Zhu Weiyan, and the reliability and validity were tested (Zhu, 2010). The table included eight items of diabetes treatment, disease, hypoglycemia, the effect of physical exercise, reducing the risk of complications, the effect of smoking/drinking, foot care, diet/food, and it included 8 dimensions and 111 questions. Each item had three options: right, wrong, and unknown. Those who agree with the correct answer would receive 1 point, and those who answer incorrectly or didn't know would receive zero points. A higher score indicated a higher diabetes knowledge, while a low score indicated a poor mastery of diabetes knowledge. Results Content validation index of Chinese AD Knowledge form was 0.92, and Cronbach's alpha index was 0.90.

3. Chinese Version of Type 2 Diabetes Self-efficacy Scale was used to measure participants' self-efficacy. This scale was designed by Lorig and Holman (2003) of Stanford University in the United States, and translated into Chinese (Sun, 2010). A total of 8 items were included, which reflected the self-efficacy of diabetics in many aspects, including diet management, exercise management, disease control and so on. Each item was scored on a 1-10 scale, which 1 meant no confidence at all, and 10 means absolute confidence. The average score of the 8 items reflected self-efficacy, and the higher the score, the higher the self-efficacy. The Cronbach's alpha index of this scale was 0.86.

4. Social Support Rating Scale (SSRS) was an instrument used to measure the level of social support. This scale was designed by Shuiyuan Xiao (Xiao, 1994).

The scale includes three aspects: subjective support, objective support, and support utilization. Subjective support reflected the level of social support perceived by individuals; objective support meant the objective and practical support that individuals receive, including material direct assistance and the existence and participation of social network group relationships; the utilization of support meant the degree of individual utilization of support. The scale had a total of 10 items, it used a 4-point scale from 1 to 4 points. The sixth and seventh items chose "no source" and get 0 points and chose "the following sources". Scale analysis methods: 1) Total score: the sum of 10 items. 2) Objective support score: 2, the sum of 6-7 item scores. 3) Subjective support score: 1.3.4, 5, the sum of item scores. 4) Utilization of support, the sum of 8, 9, and 10 items. The higher the total score, the higher social support. The scale's Cronbach alpha coefficient was .69 (Liu et al., 2008)

5. Chinese version of the Adult Hypoglycemia Fear Questionnaire (CHFSII) was an instrument used to measure the level of fear of hypoglycemia. It was developed by Professor D.J. Cox of the University of Virginia School of Medicine (Cox et al., 1987). On the basis of the original scale, the scale was translated, localized and revised to develop a Chinese version of the Hypoglycemia Fear Scale for diabetic patients in my country, and to verify the psychometric properties of the scale (Mu, 2015). It consisted of 13 items. Each item was scored on a 0-4 scale (0 = never, 1=rarely, 2=sometimes, 3=often, always = 4) based on how diabetic patients have felt in the last 6 months, with scores ranging from 0 to 52, with a higher total score indicating a higher fear of hypoglycemia. The retest reliability and Cronbach 'α coefficient of the scale was 0.96 and 0.89 respectively. The ChFS II-WS scale has good reliability, validity and stable structure, which could be further promoted and applied in Chinese patients with type 2 diabetes.

6. Eating Behavior Compliance Scale for Type 2 Diabetic Patients was used to assess the eating behavior of people with type 2 diabetes (Zhao et al., 2017). This study used a questionnaire on eating behavior in this scale, it included five dimensions, namely dietary self-control, glycolipid compliance, oil and salt compliance, fruit and vegetable compliance, and cooking and eating habits. There were a total of 23 items, using Likert Type 5-level scoring method, each option represented the following point value: never = 1, rarely = 2, sometimes = 3 often =

4, always = 5. The total score ranged from 23 to 115, with higher scores representing better eating behavior. The overall Cronbach's A coefficient was .88, and the Cronbach's A coefficient of each dimension was .76- .88. The scale had good validity.

Psychometric properties of the instruments

Validity

All the tools used in this study were standardized tools to be widely used, and their validity has been determined, so no validity test was performed.

Reliability

A preliminary study on reliability measurement of 30 patients with the same characteristics in the Endocrinology Clinic of the First Affiliated Hospital of Wenzhou Medical University. The pilot study was conducted over one day, and the researcher randomly selected 30 patients from an endocrinology clinic. The acceptable value of Cronbach alpha coefficient analysis was at > 0.70. For social support, the scale's Cronbach alpha coefficient was .72. For fear of hypoglycaemia, the scale's Cronbach alpha coefficient was .88. For diabetes knowledge, the scale's Cronbach alpha coefficient was .86. For self-efficacy, the scale's Cronbach alpha coefficient was .83. For eating behavior, the scale's Cronbach alpha coefficient was .89.

Human subject protection

Approval for conducting the study was obtained from the Institutional Review Board (G-HS038/2565), Burapha University, Thailand. After the proposal was approved, it was submitted to the Research Ethics Committee of The First Affiliated Hospital of Wenzhou Medical University (KY2022-125).

After approval, all participants were informed carefully about the aims of the study and the involvement procedure. The researcher described the nature of the study and also emphasized the individuals' rights to participate or to refuse to participate in the study. The data in this study only was collected from those individuals who were willing to participate and signed the consent form. The consent form was completed before data collection. The participants were informed that they had the right not to answer any questions and have the right to change their mind and

withdraw from the study at any time if they want. All the forms for collecting data were anonymous and participating in this study is no harm for the participants.

Confidentiality was maintained, and no names or other identifiable information were disclosed in this study report. All data on the paper documents were stored in a secure place and only be utilized for the research, and all electronic data was locked by a password that only the researcher can be accessed. All data was destroyed one year after the publication of the research day. Also, if any individuals would like to know the results of this study, they could contact the researcher.

Data collection procedures

The successful date of ethical approval of the data collection procedure was Burapha University in Thailand: August 31, 2022, and Wenzhou Medical University: September 4, 2022. The data was collected from October 1st to December 1st, 2022. Data were collected at the Endocrinology Clinic of the First Affiliated Hospital of Wenzhou Medical University, Wenzhou, Zhejiang, China. The data collection process includes:

1. After the researcher obtained approval from the Graduate school BUU, the researcher submitted the research proposal to IRB in BUU and IRB in the First Affiliated Hospital of Wenzhou Medical University, China for ethical review.

2. The researcher asked permission for data collection from the Graduate school BUU and the First Affiliated Hospital of Wenzhou Medical University, China regarding the objectives and procedures of the study information.

3. After obtaining permission from the First Affiliated Hospital of Wenzhou Medical University, China. The researchers explained the data collection procedure to staff working on the endocrinology outpatient department.

4. Data collection was performed daily in the endocrinology outpatient department from 8:30 am to 11:30 am and 1:30 pm to 4:30 pm (Monday to Friday)

5. The line-up of individuals who met the inclusion criteria was pre-recorded in the application process for simple random sampling. The researcher completed data collection at the participant's bedside in the endocrinology outpatient department.

6. In the endocrinology outpatient department, patients were required to wear masks throughout the process, participants were accepted temperature screening, and they showed the secure itinerary two-dimensional code (the official way of reporting residents' health status). Participants with a green code and a body temperature below 37.3°C were admitted to the outpatient department. The outpatient department was routinely disinfected every day, and researchers were required to wear masks as required. Each participant maintained a one-meter social distance from other participants and researchers.

7. The researcher met and informed the participants about the aim of the study, ethical issues, and human protection of the study. Written consent was signed after the participants understood and were willing.

8. The questionnaire was conducted in the endocrinology outpatient department. Before answering the questionnaire, the researcher came to a special reception room, keeping the environment quiet, and prepared reading glasses to ensure that the participant could see clearly. It took 15-20 minutes to complete the entire set of questionnaires. The researchers ensured that the participants responded in a comfortable situation.

9. The researcher checked if the questionnaires had been filled in completely after the participants submitted them. All the participants were informed if they chose not to answer some of the questions purposely, they could leave them unanswered.

10. This process repeated until reached the required sample size.

Data analysis

Descriptive statistics including frequency, percentage, mean (M) and standard deviation (SD), possible range and actual range were used to describe demographic and other variables. Multiple linear regression analysis was performed on the factors affecting the patients' eating behaviors. Testing the multiple linear regression hypothesis. Differences were considered statistically significant at $p < .05$.

CHAPTER 4
RESULTS

This chapter presents the results of the study including description of demographic characteristics of the sample, description of studied variables, and using Pearson correlation analysis and multiple linear regression to indicate factors influencing eating behavior of patients with type2 diabetes mellitus with poor glycemic control in Wenzhou, China.

Description of demographic characteristics of the sample

A total of 191 sets of questionnaires were distributed. 185 questionnaires were completed. The attrition rate was 3.14%. There were more men than women, there were 55.70% of men and 44.30% of women. The majority participants were aged between 45 and 59, accounting for 76.60%. 40.00% of people with the diabetes course of 1-10 years. The proportion of patients' educational background in each stage was relatively equal. The majority were married (87.00%) and living in rural areas (55.10%). 45.90% of people have an annual income of less than RMB 100,000. Most people had a BMI of 25-30(54.60%), no complications (64.30%), and oral hypoglycemic drugs combined with insulin (81.10%). The highest HBA1c was 20.8 mmol/L, the lowest is 7.1mmol/L, and the average was 10.1 mmol/l. The highest fasting blood glucose value was 22mmol/L, the lowest value was 4.4mmol/L, and the average value was 9.9mmol/L. The demographic characteristics of the participants are described in table 1.

Table 1 Description of demographic characteristics of the sample (n= 185)

Variables	Number (*n*)	Percentage (%)
Gender		
Males	103	55.70
Females	82	44.3
Age (Range =19-59, mean =46.10, SD =10.40)		
18-44	60	32.40
45-59	125	67.60
Course of diabetes (Range =0.1-25, mean =4.70, SD =5.26)		
Less than a year	66	35.70
1-10 years	74	40.00
More than 10 years	45	24.30
Education Background		
Primary High School	39	21.10
Junior High School	52	28.10
Senior High School	57	30.80
University or above	37	20.00
Marital status		
Single	24	13.00
Married	161	87.00
Place of residence		
Urban area	102	55.10
Rural area	83	44.90
Annual salary (Range =300,000-560,000 mean = 136,756.75, SD = 95,759.38)		
Less than 100,000 RMB	85	45.90
100,000 to 200,000 RMB	69	37.30
More than 2000,000RNB	31	16.80

Table 1 (Continued)

Variables	Number (*n*)	Percentage (%)
BMI		
Less than 18.5	6	3.20
18.5-23.9	62	33.50
24-26.9	66	35.70
27-29.9	43	23.20
More than or equal to 30	8	4.3
Complication numbers		
0	119	64.30
1	48	25.90
2	15	8.10
3 or more than 3	3	1.70
Treatment plan		
Oral medication	17	9.20
Insulin	18	9.70
Oral medication+Insulin	150	81.10
HbA1c: M = 10.1; SD = 2.02; Rang = 7.1-20.8		
FBG: M = 9.9; SD = 2.1; Rang = 4.4-22		

Description of the study variables

Description of diabetic eating behavior

The diabetic eating behavior in this study included 5 dimensions, which were diet self-management, carbohydrate-lipid diet compliance, oil-salt diet compliance, fruit and vegetable diet compliance, cooking and dining habits. As shown in Table 2, the mean of total score of diabetic eating behavior was 75.25(SD=14.72). The mean total score for the self-control of eating behavior scale was 15.94 (SD=3.43). The mean total score for the glycolipid compliance behavior scale was 17.32(SD=4.18). The mean total scores for the oil and salt compliance behavior were

12.90 (SD = 3.73). The mean total score for the fruit and vegetable compliance behavior was 16.56 (SD =3.81). The mean total score for the cooking and eating habits was 12.50(SD=3.36).

Table 2 Description of diabetic eating behavior(n=185)

Variables	Possible range	Actual range	Mean	SD
Diabetic eating behavior	23-115	33-111	75.25	14.72
Self-control of eating behavior	5-25	7-24	15.94	3.43
Glycolipid compliance behavior	5-25	6-25	17.32	4.18
Oil and salt compliance behavior	4-20	4-20	12.90	3.73
Fruit and vegetable compliance behavior	5-25	7-25	16.56	3.81
Cooking and eating habits	4-20	5-20	12.50	3.36

Description of selected factors

Factors related to diabetic eating behavior also include social support, self-efficacy, and fear of hypoglycemia, as shown in table 3. Table 3 illustrates that the fear of hypoglycemia score ranged from 0-37, with a mean of 6.18 (SD = 6.67). Social Support ranged from 21 to 57, with a mean of 41.23 (SD = 6.66), which indicated high social support. Diabetic self-efficacy ranged from 1.50-10, with the mean score of 6.92(SD=1.85). Diabetes knowledge was divided into oral medication group, the insulin group and the oral medication+insulin group. For the oral medication group, the score ranged from 40-91, with the mean score of 70.58(SD =13.23). For the insulin group, the score ranged from 41-88, with the mean score of 71.5(SD =11.00). For the oral medication + insulin group, the score ranged from 26-99, with the mean score of 74.48(SD=13.41).

Table 3 Description of selected factors (n=185)

Variables	Possible range	Actual range	M	SD
Fear of hypoglycemia	0-52	0-37	6.18	6.67
Social support	12-64	21-57	41.23	6.66
Diabetic self-efficacy	1-10	1.5-10	6.92	1.85
Diabetes knowledge				
Oral medication group	0-96	40-91	70.58	13.23
Insulin group	0-103	41-88	71.50	11.00
Oral medication + insulin group	0-111	26-99	74.48	13.41

Relationship between diabetic eating behavior and influencing factors

The kurtosis and skewness were used to test normal distribution. Each variables including diabetic eating behavior, social support, fear of hypoglycemia, diabetes knowledge and self-efficacy, their kurtosis and skewness were not between (-1.96) and (+1.96), indicating that they were not normally distributed. Pearson correlation coefficient was used to analysis, which were showed in table 4. Multivariate linear regression was used to analyze the relationship between the four variables and diabetic eating behavior, which were showed in table 5.

The correlation between the variables showed no correlation between fear of hypoglycemia and the other four variables ($p > .01$). There was a positive correlation between social support and diabetic self-efficacy ($r = .195$, $p < .01$). There was a positive correlation between social support and diabetic eating behavior ($r = .149$, $p < .05$). There was a positive correlation between diabetic self-efficacy and diabetes knowledge ($r = .183$, $p < .05$). There was a positive correlation between diabetic self-efficacy and diabetic eating behavior ($r = .439$, $p < .01$). There was a positive correlation between diabetes knowledge and diabetic eating behavior ($r = .250$, $p < .01$).

Table 4 Correlation matrix between factors and diabetic eating behavior (n=185)

Variables	Fear of Hypoglycemia	Social support	Diabetic self-efficacy	Diabetes knowledge	Diabetic eating behavior
Fear of Hypoglycemia	1	-.108	-.098	.030	.040
Social support		1	.195**	.051	.149*
Diabetic self-efficacy			1	.183*	.439**
Diabetes knowledge				1	.250**
Diabetic eating behavior					1

Note: *$p < .05$, **$p < .01$

Factors predicting diabetic eating behavior

Before proceeding with the analysis, the assumptions of the multiple regression tests were tested. The dependent variable is multivariate in this study. The Durbin-Watson statistic is 1.964, indicating that the observations/independent variables are independent of each other. Multicollinearity among the independent variables was tested using the variance inflation factor (VIF). All VIFs < 10 indicate that the model is well constructed. There is a linearity of independent variables and log odds. Diabetes self-efficacy (VIF = 1.081), fear of hypoglycemia (VIF = 1.021), social support (VIF = 1.048), social support (VIF = 1.048), diabetes knowledge (VIF = 1.037). All VIF< 5, indicating all variables without severe multicollinearity, no outliers, and homoscedasticity test yields were significant ($p < .001$).

Table 5 presents the results obtained from multiple regression analysis. An alpha of < .05 was considered statistically significant. The results of multiple linear regression analysis showed that the regression equation was significant, $F = 13.672$, $p < .001$. Among them, diabetic self-efficacy ($\beta = .402$, $p < .05$), diabetes knowledge ($\beta = .171$, $p < .05$), could significantly and positively predict the diabetic eating behavior. Fear of hypoglycemia ($\beta = .083$, $p > .05$) and social support ($\beta = .071$, $p > .05$) could

not predict the diabetic eating behavior. These variables together explained 21.30% of the variance in diabetic eating behavior.

Table 5 Multiple linear regression analysis of diabetic eating behavior (n=185)

Factors	B	SE	**β**	t	p-value
Diabetic self-efficacy	3.203	.541	.402	5.920	.000
Fear of hypoglycemia	.182	.146	.083	1.252	.221
Social support	.157	.148	.071	1.063	.289
Diabetes knowledge	5.022	1.953	.171	2.572	.011

R= .480, R^2 = .230, Adjusted R^2= .213, P-value< .05, Constant value = 43.074

CHAPTER 5
CONCLUSION AND DISCUSSION

This study aimed to d hypoglycemia, escribe diabetic eating behavior and its factors, including fear ofdiabetes self-efficacy, social support, diabetes knowledge. This chapter delineates a summary and discussion of the study results, conclusions, implications for nursing practice and recommendations for future research.

Summary of the study

The objective of this study was to assess eating behavior in patients with type 2 diabetes with poor glycemic control and to determine the predictive relationship between hypoglycemic fear, diabetic self-efficacy, social support, diabetes knowledge, and diabetic eating behavior. A simple random sampling method was used to collect data from the outpatient department of Endocrinology of the First Affiliated Hospital of Wenzhou Medical University from Monday to Friday. Data were collected using self-report questionnaires, including demographic records, Chinese Version of Diabetes Knowledge Scale(Zhu, 2010), Chinese Version of Type 2 Diabetes Self-efficacy Scale(Sun, 2010), Social Support Rating Scale (SSRS)(Xiao, 1994) , Chinese version of the Adult Hypoglycemia Fear Questionnaire. (CHFSII)(Mu, 2015), Eating Behavior Compliance Scale for Type 2 Diabetic Patients(Ying & Xuemei, 2018). The Cronbach's alpha for the fear of hypoglycemic, diabetic self-efficacy, social support, diabetes knowledge, diabetic eating behavior were .88, .83, .72, .86, .89 respectively.

The results showed that the participants ranged in age from 19 to 59, with an average age of 46.10. The majority of participants were male (55.70%). Most of the patients with type 2 diabetes who participated in the survey were married (87.00%), and the majority of patients were in urban areas of Wenzhou (55.10%). Most of the patients had BMI between 25-30 (54.60%), most of the patients had no complications (64.30%), and most of the patients had to be treated with oral hypoglycemic agents plus insulin (81.10).

Participants had an average diabetic eating behavior score of 75.25 (SD = 14.72). The average score of dietary self-management was 15.94 points (SD =3.43), the average score of carbohydrate-lipid compliance behavior was 17.32 points (SD = 4.), and the average score of oil-salt compliance behavior was 12.90 points (SD =3.73). The average score of fruit and vegetable compliance behavior was 16.56 (SD=3.81), and the average score of cooking and eating habits was 12.50 (SD=3.36).

The results showed that fear of hypoglycemic, diabetes self-efficacy, social support, and diabetes knowledge together explained 21.3% of the variance in diabetes eating behavior in patients with type 2 diabetes with poor glycemic control ($F = 13.772$, $p < .001$). Because the dependent variable of eating behavior is influenced by many factors, the independent variable can explain 21.3 percent of eating behavior, so Adjusted $R^2 = .213$ was relatively high. Diabetic self-efficacy ($\beta = .402$, $p < .05$), diabetes knowledge ($\beta = .171$, $p < .05$), could significantly and positively predict the diabetic eating behavior. Fear of hypoglycemia ($\beta = .083$, $p > .05$) and social support ($\beta = .071$, $p > .05$) could not predict the diabetic eating behavior .

Discussion

Diabetes eating behavior in patients with type 2 diabetes mellitus with poor glycemic control

A healthy diet is central to the management of T2DM. This study showed that type 2 diabetes patients with poor glycemic control in Wenzhou, China, had relatively moderate levels of eating behavior, which was similar to other studies. In a domestic survey on the dietary control behavior of type 2 diabetes and its influencing factors, The eating behavior of 210 patients with type 2 diabetes was not well controlled, and only 38.6% of the patients could strictly control their diet (Wen et al., 2012). In a study of the eating behaviors of 421 people with type 2 diabetes in northern Ethiopia, 54.4% of the participants had unhealthy eating behaviors (Gebreyesus et al., 2021). This study proves that healthy eating education has a very important effect on the eating behavior of diabetic patients. A survey on the status quo of poor diet and eating behaviors of diabetic patients shows that about 35 percent of patients have bad eating behaviors such as diet, drinking, salty taste, and eating fast, which is not conducive to blood sugar control in the long run.(Tao et al., 2014).

Another study showed that the eating behaviors of people with diabetes, such as increasing the number of meals, dairy intake, and eating speed, can affect the occurrence and development of diabetes complications.(Yan et al., 2010). The change of eating behavior has been paid more and more attention in the comprehensive treatment of diabetes. Whether patients develop healthy eating behavior and change bad eating behavior is considered to be a sign to measure the success of diabetes education programs.(Gong, 2005). Therefore, the analysis of factors affecting the dietary behavior of diabetic patients is helpful for targeted nutritional intervention and dietary education.

Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control

Fear of hypoglycemia

The results indicated that fear of hypoglycemic had no significant effect on the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control ($\beta = .083$, $p > .05$). This is inconsistent with Peipei Gu's research, which showed that fear of hypoglycemic is negatively correlated with diabetic eating behavior (Gu, Su, et al., 2019). Perhaps because of the patient's fear and worry about hypoglycemia, the patient should slightly change the commonly used strategy of hypoglycemia food intake, such as overeating to correct hypoglycemic events (Martyn-Nemeth et al., 2017). Another study showed fear of hypoglycemic degree is the influencing factor of patients' dietary behavior compliance (Li et al., 2020). Because the fear of hypoglycemia can easily lead patients to take avoidance actions to give up normative self-management and induce changes in related behaviors, thus reducing their dietary behavior compliance (Huang et al., 2018). However, the results of this study showed that fear of hypoglycemia did not predict eating behavior. A study showed that the longer the course of diabetes patients, the more serious the hypoglycemia (Zhao et al., 2020). Therefore, in this study, some participants with a shorter course of disease had little or no experience of hypoglycemia, so there was no fear of hypoglycemia, which affected the results of the study. There are also some participants who do not have enough cognition of hypoglycemia and do not know the harm caused by hypoglycemia, because with the prolonged course of the disease,

diabetic patients have a deeper understanding of the disease and the harm of hypoglycemia, but they are more worried about the adverse effects caused by hypoglycemia (Zhao et al., 2020). It's also related to the number of times hypoglycemia occurs (Li et al., 2021). This had some effect on the results of the study.

Some people believed that hypoglycemia was caused by increased physical activity, a wrong insulin injection, or inappropriate medication, so they tried to prevent hypoglycemia by adjusting the dose and time of activity, rather than changing their eating behavior. In addition, some patients due to the lack of awareness of hypoglycemia, when hypoglycemia occurs, they did not know how to deal with, but also did not know what food to eat.

Social support

Research results show that social support could not predict the diabetic eating behavior ($\beta = .071$, $p > .05$). Probably because social support includes not only family support, but also neighbors, friends, social institutions. Most of the participants lived with their families, ate meals with their families and listened to their opinions. While they may had good social connections, family support was closely linked to their lifestyle habits and eating behaviors, so other social support did not necessarily influence participants' eating behaviors. In addition, general social support may not be targeted, such as the help received when experiencing difficulties, participation in social groups, number of family members, and relationships with peers and neighbors, which were not targeted social support for people with diabetes and may not affect their eating behavior. The result was not consistent with some studies. A study showed that the level of social support was positively correlated with the eating behavior of diabetic patients (Yan et al., 2018). Another study demonstrated that social support has a positive effect on diabetes self-management, which includes eating behaviors (Al-Dwaikat et al., 2020). In fact, not all studies have proven that social support is a predictor of diabetic eating behavior. In a study of 27 African Americans with type 2 diabetes who visited an outpatient clinic, Chlebowy and Garvin (2006) found no association between social support and blood sugar control or self-care behaviors (such as diet and physical activity), similar to the findings in this study. The following reasons may exist. This study used a general social support

assessment scale rather than a social support scale specific to diabetes self-management. Gallant found that in a review of research on social support and chronic illness, support was specific to disease or treatment options when the positive correlation between social support and self-care behavior was enhanced, this could also affect the results of the study (Gallant, 2003). Glasgow and Toubert (1988) also found that specific social support influenced specific self-care behaviors more accurately than general social support. According to these studies, it is indeed possible to suggest that the more directionality of social support behavior in terms of disease and disease-specific management practices, the stronger its association with self-care behavior, including eating behavior performance. This may also be one reason why the results of this study are inconsistent with those of other studies. The content of social support in this study includes the amount of social support, such as how many close friends do you have? However, in a study of 1198 chronic disease patients, the amount of support was not a predictor of self-care behaviors, including eating behaviors, in people with diabetes (Sherbourne et al., 1992). Disease-specific social support is less prevalent in the self-management of diabetic patients. General social support is present in every person with diabetes, but whether it is a predictor of diabetic eating behavior remains to be seen. Plus, most of the participants were adults, not older people. Older adults often need more social support from their families to implement healthy eating behaviors (Wen et al., 2004).

Diabetic self-efficacy

Research result shows self-efficacy could significantly and positively predict the diabetic eating behavior ($\beta = .402$, $p < .05$). Self-efficacy gives a feeling of having control in a person to solve the problems and face the source of the problems by carrying out routine control to check blood glucose levels and regular to medical control (Kusuma & Hidayati, 2013). When people with diabetes have confidence in their disease, they were motivated to change their eating behavior. This is consistent with the another study. This study proved that self-efficacy had a positive effect on eating behavior of people with type 2 diabetes (Putra et al., 2015). It was asserted that by increasing self-efficacy and family support would increase awareness of T2DM patients to commit toward healthy eating behaviors. If type2DM patients had good self-efficacy on eating behaviors, it will be increasing their behaviors for managing

dietary challenges and selecting a healthy diet and amount (Putra et al., 2016). Centis et al (Centis et al., 2014) have shown that self-efficacy is significantly related to the increase in diet-promoted behaviors. In fact, various studies have shown that T2DM education programs applying self-efficacy theory can improve self-management (King et al., 2010). Another study showed that greater self-efficacy predicted less overeating, as well as stricter adherence to an ideal diet (Aljasem et al., 2001). Pender (Pender, 1987) also pointed out that self-efficacy is a behavior-specific cognition that influences commitment to health-promoting behaviors and directly promotes greater participation in health-promoting behaviors. During a diagnosis of type 2 diabetes, participants developed their self-learning process, where they knew how to control the amount of calories to manage their eating behaviors. But over time, participants had to consider all of their eating habits without confidence and belief. If they had no self-efficacy, they would get bored and have trouble sticking to them (Primanda et al., 2011). Improving the self-efficacy of patients with type 2 diabetes will have a good impact on the self-management behaviors of diabetic patients such as diet, exercise, blood glucose detection and medication, and finally achieve a better blood glucose control effect (Al-Khawaldeh et al., 2012; Atak et al., 2008). These insights provide a basis for designing effective nursing interventions to improve self-efficacy and confidence in following good eating behaviors in people with type 2 diabetes.

Diabetes knowledge

The results showed that diabetes knowledge could positively predict diabetic eating behavior ($\beta = .171$, $p < .05$). Because mastered more knowledge of diabetes can promoted their confidence and attitude to face the disease and maintain a scientific and standardized eating behavior (Ouyang & Jiang, 2018). The more health information people with diabetes have access to and the more knowledgeable they are, the more options they will have to manage diabetes to suit their condition, especially diabetes related to eating behavior. However, the information obtained must come from explainable sources, such as doctors, nurses and other health workers (Alavi et al., 2011). A study in Ethiopia demonstrated that patients who had received health education had more knowledge about diabetes, were more likely to recognize the benefits of dietary management in the treatment of the disease, and believed that the consequences of not following the recommended dietary regimen would be more

serious (Mohammed & Sharew, 2019). This finding was consistent with many studies. Sari et al. showed a significant correlation between diabetes knowledge and eating behavior, (Sari et al., 2021). Another study demonstrated a significant positive correlation between diabetes knowledge and self-care behavior, and significantly affected blood sugar control (Bains & Egede, 2011). A study proved that the level of diet and nutrition knowledge of diabetic patients directly affects their own eating habits and nutritional behaviors, and more importantly, affects their attitude and behavior in the diet treatment of diseases (Zhao et al., 2007). Disease cognition and diabetes knowledge have a significant predictive effect on the diet of patients (Kugbey et al., 2017). Diabetes knowledge is related to the state of health management, especially the knowledge of diabetes. The possibility of diabetes complications will lead to necessary preventive measures and changes in eating behavior (Adejoh, 2014). Dietary education is the main source of dietary knowledge for diabetes mellitus, so education can improve patients' compliance with dietary behavior, which is also consistent with the concept proposed (Wang & Liu, 2002). Diet education can make patients out of the wrong area of diet knowledge, and clearly improve the level of food and drink knowledge.

The results showed that diabetic self-efficacy and diabetic knowledge were two variables that influence the eating behavior of type2 diabetic patients. The research findings could confirm Pender Health Promotion Model. The model was a guide to understanding the complex biopsychosocial processes that compel people to engage in healthy behaviors that promote health (Masoudi et al., 2020). Patients' self-efficacy about their ability to move is an important predictor of their behavior (Mohamadinejad et al., 2015). The diabetes knowledge belongs to the sociocultural factors of the individual characteristic dimension in the model.

The results showed that factors including fear of hypoglycemia, diabetes self-efficacy, social support, and diabetes knowledge together explained 21.3% of the variance in diabetes eating behavior in patients with type 2 diabetes with poor glycemic control. Adjusted R^2 was greater than 10%, indicating that this data was relatively good.

Strengths and Limitations

This study focuses on describing the eating behavior of type 2 diabetic patients with poor glycemic control in Wenzhou, China, and examines the predictive relationship of hypoglycemia fear, social support, diabetes self-efficacy, diabetes knowledge, and diabetes eating behavior. Most of the previous studies focused on diabetes self-management, and there were few studies on eating behaviors. Even if there were, most of them were aimed at patients with type 1 diabetes. In addition, this study is aimed at type 2 diabetes patients with poor blood sugar control, which is more specific. This study is the first in Wenzhou, and it can be used as a baseline for patients in Wenzhou, and can guide future blood sugar management and dietary intervention for patients with type 2 diabetes. This study collected data from only one large general hospital in the Wenzhou area, and the results limit the generalization of type 2 diabetes patients in China.

Implications for nursing

Nursing practice

The results of this study provide a basis for predicting the dietary behavior and influencing factors of type 2 diabetes patients with poor glycemic control. According to the results of this study, clinical nurses can improve the eating behavior of patients with type 2 diabetes with poor glycemic control by improving their diabetic self-efficacy and diabetes knowledge. In terms of self-efficacy, nurses can pay more attention to patients' emotions and psychology, communicate and encourage more, so that patients are confident and optimistic about improving the disease. For diabetes knowledge, nurses can carry out different forms of health education, regularly conduct telephone and outpatient follow-up visits, timely answer questions raised by patients, improve patients' diabetes knowledge level, and thus improve patients' eating behavior.

Nursing research

In the future, multi-center studies should be conducted to explore countermeasures to improve the eating behavior of patients with type 2 diabetes. Further intervention studies are needed to improve diabetes knowledge and diabetes

self-efficacy in patients with type 2 diabetes, thereby improving eating behavior in patients with type2 diabetes.

Conclusion

The results showed that the eating behavior of type 2 diabetes patients in this study was at a moderate level. Diabetic knowledge and diabetic self-efficacy are important predictors of diabetic eating behavior. It can affect the eating behavior of patients and thus affect the control of blood sugar. Clinical nurses can help patients improve eating behavior by intervening in these aspects of patient.

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APPENDIX

APPENDIX A

Questionaire

Dear participant：

I, a graduate student of Burapha University & Wenzhou Medical University, am conducting research entitled “Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China”. The incidence of diabetes is increasing year by year in the world and in China, and it has become an important public issue. Poor blood sugar control is the main problem of type 2 diabetes patients, which will lead to the occurrence and aggravation of complications, thereby affecting the healthy lifespan of type 2 diabetes patients, and affecting the social economy and national burden. Eating behavior is one of the important factors affecting blood sugar control. In order to better understand the factors that affect the eating behaviors of patients with type 2 diabetes who have poor glycemic control in Wenzhou, we will conduct a related survey. If you volunteer for this study, you will need approximately 30-60 minutes to answer the three questionnaires. These questionnaires include:

1. The Demographic data questionnaire
2. Chinese version of the Adult Hypoglycemia Fear Questionnaire
3. Social Support Rating Scale
4. Chinese version of diabetic (Adult) Knowledge Scale
5. Diabetes Self-Efficacy Scale
6. Eating Behavior Compliance Scale for Type 2 Diabetic Patients

Jiali Jiang
Master’s degree student
Adult Nursing Pathway
Faculty of Nursing, Burapha University, Thailand in collaboration with
School of Nursing, Wenzhou Medical University, China

Questionnaire number: .....

Questionnaires

Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China

The questionnaires include 6 parts as follows:

Part 1. The Demographic data questionnaire with 16 items.

Part 2. Chinese version of the Adult Hypoglycemia Fear Questionnaire with 32 items.

Part 3. Social Support Rating Scale with 10 items.

Part 4. Chinese version of diabetic (Adult) Knowledge Scale with 26 items.

Part 5. Diabetes Self-Efficacy Scale with 8 items.

Part 6. Eating Behavior Compliance Scale for Type 2 Diabetic Patients 20 items.

Please read each question carefully and then chose the answer that you think suitable on your conditions.

Part 1: The Demographic data questionnaire

Direction: Please choose the answer as follow by tick ☑or write down your answers in the space provided.

温州医科大学附属第一医院

The First Affiliated Hospital of Wenzhou Medical University

1.登记号：Registration No.____

2.性别：Gender: Male□ Female□

3.年龄：Age: 18-30years old□ 31-50years old□ 51-60years old□

4.病程：Curse of disease□：Less than 1 year□ 1-10 years□ More than 10 years□

5.教育水平:Education level: Primary school□ Junior high school□ High school□ University and above□

6.婚姻状况：Marital status: Married□ Not married□

7.居住地：Residence: Urban area□ Rural area□

8.经济收入（年薪）Economic income (annual salary)：＜RMB 100,000□ 100,000-200,000 RMB□ More than 200,000RMB□

9.临床诊断 Clinic dignosis

一型糖尿病 Type 1 diabetes□ 2 型糖尿病 Type 2 diabetes□ 其他类型 Other type□

10.身高 Height：＜160cm□ 160-170cm□ ＞170cm□

11.体重 Weight: ＜50kg□ 50-60kg□ ＞60kg□

12.BMI: ＜20□ 20-25□ 25-30□ ＞30□

以下信息是经过病人同意，在医院电脑系统获取

The following information is obtained on the hospital computer system with the patient's consent

13.最近的糖化血红蛋白水平 Recently glycated hemoglobin level：

14.最近的空腹血糖 Recent fasting blood glucose：

15.并发症个数 Number of complication：

16.治疗方式 Therapy method：

口服药 Oral medication 胰岛素 Insulin therapy 口服药加胰岛素联合治疗 Combination therapy with oral medication and insulin.

Part 2: Chinese version of the Adult Hypoglycemia Fear Questionnaire

Direction: This part is to about fear of hypoglycemia. Please read and think about it carefully and choose the suitable one on your condition. Please choose the answer as follow by tick √

中文版成人低血糖恐惧调查表（CHFSII） Chinese version of the Adult Hypoglycemia Fear Questionnaire					
顾虑量表：以下条目是描述糖尿病患者对于低血糖的顾虑。请仔细阅读每个条目。请您选出每个条目中能正确描述，您在过去 6 个月中对低血糖所存在的顾虑的那个选项。填表说明：所有题目均共用答案，请在对应的选项下划“o”，每题限选一个答案。Concern Scale: The following items describe the concerns of people with diabetes about hypoglycemia. Please read each entry carefully. Please select the option in each item that correctly describes your concern about hypoglycemia in the past 6 months. Instructions for filling in the form: All questions share the same answer, please mark "o" under the corresponding option, and select only one answer per question.					
因为我的血糖可能下降，我担心： Because my blood sugar may drop, I am concerned about:	从没有 never	很少有 rare	有时 sometimes	经常这样 often	总是这样 always
1.当我要发生低血糖的时候，自己没意识到 When I was about to have low blood sugar, I didn't realize it					
2.在公共场合晕倒 fainting in public					

3.在社交场所让自己或朋友感到尴尬 Embarrass yourself or a friend in a social setting					
4.一个人的时候发生低血糖 low blood sugar while alone					
5.显得很愚蠢或醉态 appear stupid or drunk					
6.失去控制 out of control					
7.在发生低血糖的时候，周围没人帮助 No one around to help when you have low blood sugar					
8.出现过失或意外 Negligence or accident					
9.受到别人不好的评论或议论 receiving negative comments or comments from others					
10.低血糖时影响我的正确判断 Low blood sugar affects my correct judgment					
11.意外弄伤白己或他人 accidental injury to self or others					
12.对自己的躯体或健康造成永久性伤害 Permanent damage to one's body or health					
13.睡眠中发生低血糖 low blood sugar during sleep					

Part 3. Social Support Rating Scale

Direction: This part is to about your situation of social support. Please read and think about it carefully and choose the suitable one on your condition. Please choose the answer as follow by tick ☑

Social Support Rating Scale（SSRS）				
1.How many close friends do you have who can be supported and helped? 您有多少关系密切，可以得到支持和帮助的朋友？	None ☐一个也没有	1-2 ☐1-2 个	3-5 ☐3-5 个	6 or more ☐6 个或以上
2.You in the past 1 year: 近1年来，您	Away from family members and living alone in a room ☐远离家人，独居一室	The residence changes frequently, and strangers live together most of the time; ☐住处经常变动，多数时间和陌生人住在一起	Live with classmates, colleagues or friends; ☐和同学，同事或朋友住在一起	Live with family; ☐和同学，同事或朋友住在一起

3.You and your neighbors 您和邻居: 	Never caring about each other, just nodding acquaintances; ☐互相之间从不关心，只是点头之交	If you encounter difficulties, you may be slightly concerned about: ☐遇到困难可能稍微关心	Some neighbors care about you; ☐有些邻居很关心您	Most of your neighbors care about you. ☐大多数邻居很关心您
4.You and your colleagues: 您与同事:	Never caring about each other, just nodding: ☐相互之间从不关心，只是点头之交	They may be a little concerned when you encounter difficulties; ☐遇到苦难可能稍微关心	Some colleagues care about you; ☐有些同事很关心您	Most colleagues care about you. ☐大多数同事很关心您

5.Support and care from family members (mark circle in the appropriate box) 从家庭成员的到的支持和照顾（在合适的框内画圆圈）		Without 无	Very little 极少	Generally 一般	Full support 全力支持
	A.Couple(lover) 夫妻（恋人）				
	B. Parents 父母				
	C. Children 子女				
	D. Brothers and sisters 兄弟姐妹				
	E.Other members 其他成员				
6.In the past, the sources of financial support and practical problem-	No source 无任何来源	The following sources: (multiple choices are allowed) 下列来源（可多选项） A. Spouse ☐配偶 B. Other family members			

solving help you have received in times of distress include: 过去在您遇到急难情况时，曾经得到的经济支持或解决实际问题的帮助的来源有		☐其他家人 C. Relatives ☐亲戚 C. Colleagues ☐同事 D. Work Unit ☐工作单位 E. An official or semi-official organization such as the Caucus trade union ☐党团工会等官方或半官方组织 G Non-official organizations such as religious and social groups ☐宗教，社会团体等非官方组织 H Others (please list) _____其他，（请列出）
7.In the past, sources of comfort and concern you have received in times of distress include: 过去，在您遇到急难情况时，曾经得到的安慰和关心的来源：	No source 无任何来源	The following sources: (multiple choices are allowed) 下列来源（可多选项） A. Spouse ☐配偶 B. Other family members ☐其他家人 C. Relatives ☐亲戚 D. Colleagues ☐同事 E. Work Unit ☐工作单位 F. An official or semi-official organization such as the Caucus trade union

		☐党团工会等官方或半官方组织 G. Non-official organizations such as religious and social groups 宗教，社会团体等非官方组织 H. Others (please list) _____其他，（请列出）		
8.How to talk when you are troubled: 您遇到烦恼时的倾诉方式：	Never tell anyone ☐从不向任何人倾诉	Only talk to 1-2 people who are very close ☐只向关系密切的1-2人倾诉	If a friend asks you, you will say it ☐如果朋友主动询问，您会说出来	Take the initiative to talk about your troubles to gain support and understanding ☐主动倾诉自己的烦恼，以获得支持和理解。
9. How to get help when you are in trouble: 您遇到烦恼时的倾诉方式	Rely on oneself, not accept help from others ☐只靠自己，不接受别人帮助	Rarely ask for help ☐很少请求别人帮助	Sometimes ask for help ☐有时请求别人帮助	When in difficulty, I often seek help from my family, relatives, friends, and organizations ☐有困难的时候经常向家人，亲友，组织救援
10.For groups (such as party	Never participate	Participate occasionally	Participate often	Actively participate and be

organizations, religious organizations, trade unions, student unions, etc.) organizing activities, you: 9. 对于团体（如党团组织，宗教组织，工会，学生会等）组织活动，您会	☐从不参加	☐偶尔参加	☐经常参加	active ☐主动参加并积极活动

Part 4. Chinese version of diabetic (Adult) Knowledge Scale

Direction: This part is about your knowledge of diabetes. Please tick ☑ in the item which best reflects what you actually do. Please answer every question.

条目 Items	请在相应的口内划 Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 do not know
1. 下列有关糖尿病的说法，您认为：Which of the following statements about diabetes do you think			
A. 糖尿病通过治疗是可以控制的 Diabetes can be controlled with treatment	口	口	口
B. 尿中出现少量的葡萄糖是正常的 A small amount of glucose in the urine is normal	口	口	口
C. 糖尿病过段时间有可能会自愈 Diabetes may go away on its own	口	口	口
D. 情绪紧张可影响血糖水平 Emotional stress can affect blood sugar levels	口	口	口
E. 血糖水平不会影响发生糖尿病并发症的风险 Blood sugar levels don’t affect risk of diabetes complications	口	口	口
2. 应用口服药治疗糖尿病时，您认为口服药：When taking oral medicines for diabetes, do you think oral medicines: **此项用于口服药物治疗的糖尿病患者 Diabetic patients treated with oral medication**			
A. 帮助降低血糖水平 Help lower blood sugar levels	口	口	口
B. 不需要每天服用 Does not need to be taken every day	口	口	口
C. 如果尿中查出没有葡萄糖则可以停止用药 Stop medication if no glucose is found in urine	口	口	口
D. 有时会导致低血糖 sometimes cause low blood sugar	口	口	
3. 如果您采用口服降糖药物治疗，当您生病出现食欲不振未进食时，进行下列活动：If you are on oral hypoglycemic medication, do the following activities when you are sick and have loss of appetite and not eating:			

此项用于口服药物治疗的糖尿病患者 Diabetic patients treated with oral medication			
A. 检测血糖 Check blood sugar	口	口	口
B. 继续吃药 keep taking medicine	口	口	口

条目 Items	请在相应的口内划“✓” Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 Do not know
C. 如果血糖水平过低则停止服药 Stop taking medication if blood sugar levels get too low	口	口	口
D. 如果您口渴得厉害，不得不大量饮水，则需要看医生 If you are so thirsty that you have to drink a lot of water, you need to see a doctor	口	口	口
4. 如果您采用胰岛素治疗，当您生病出现食欲不振未进食时，进行下列活动：If you are on insulin, do the following activities when you are sick and have a loss of appetite and do not eat: 此项用于胰岛素治疗的糖尿病患者 Diabetic patients treated with insulin			
A. 减少胰岛素的用量 reduce insulin dosage	口	口	口
B. 经常监测血糖和尿酮水平 Frequent monitoring of blood sugar and urine ketone levels	口	口	口
C. 如果尿酮阳性则增加额外的速效胰岛 Add additional rapid-acting insulin if urine ketones are positive	口	口	口
D. 如果您口渴得厉害，不得不大量饮水，则需要看医生 If you are so thirsty that you have to drink a lot of water, you need to see a doctor	口	口	口
5. 有关低血糖的描述：Description of low blood sugar:			
A. 血浆中葡萄糖很少 Very little glucose in plasma	口	口	口

B.血浆中葡萄糖较多 more glucose in plasma	口	口	口
C.体力活动增加可引起低血糖 Increased physical activity can cause hypoglycemia	口	口	口
D.酒精可引起低血糖 Alcohol can cause low blood sugar	口	口	口
E.胰岛素用量过多可引起低血糖 Too much insulin can cause hypoglycemia	口	口	口
6. 下列哪些是低血糖的症状：Which of the following are symptoms of low blood sugar:			
A.言语含糊不清 slurred speech	口	口	口
B.口渴 Thirsty	口	口	口
C.出汗 sweat	口	口	口
D.眩晕 dizziness	口	口	口
E.意识混乱 confusion	口	口	口
F.多尿 polyuria	口	口	口
7. 如果你发生低血糖 if you have low blood sugar			
A.立刻喝含糖的饮料 drink sugary drinks right away	口	口	口
B.立即进食一块巧克力或者饼干 Eat a chocolate or biscuit right away	口	口	口
C. 处理低血糖后，休息 15 分钟 After dealing with low blood sugar, rest for 15 minutes	口	口	口
8. 运动的作用：The role of exercise:			
A.降低血糖水平 lower blood sugar levels	口	口	口

条目 Items	请在相应的口内划“✓” Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 Do not know
B.升高血糖水平 Raised blood sugar levels	口	口	口
C.增加尿中的葡萄糖水平 increase the level of glucose in the urine	口	口	口

D.不改变血糖水平 Does not change blood sugar levels	□	□	□
9. 如果您使用胰岛素治疗，运动前 1 小时，进行下列活动：If you are on insulin therapy, 1 hour before exercise, do the following: **此项用于胰岛素治疗的糖尿病患者 Diabetic patients treated with insulin**			
A.测血糖 measure blood sugar	□	□	□
B.进食量不变，则减少胰岛素的用量 If you eat the same amount of food, reduce the amount of insulin	□	□	□
C.胰岛素用量不变，则进食较平常多的食物 Eat more food than usual with the same amount of insulin	□	□	□
D.减少食物量，并增加胰岛素用量 Reduce the amount of food and increase the amount of insulin	□	□	□
E.如果发生低血糖，则快速进食含糖食品 If low blood sugar occurs, eat sugary foods quickly	□	□	□
10. 如果您使用胰岛素治疗，进行下列活动：If you are on insulin therapy, do the following: **此项用于胰岛素治疗的糖尿病患者 Diabetic patients treated with insulin**			
A.如果您在两餐之间进食了一块巧克力，则需要增加胰岛素的用量。If you eat a piece of chocolate between meals, you need to increase your insulin dose	□	□	□
B. 如果您在餐前 1 小时内进食了点心，则可以等到下餐前，不需要增加胰岛素用量 If you eat a snack within 1 hour before a meal, you can wait until the next meal without increasing your insulin dose	□	□	□
C.加餐都需要增加胰岛素用量 Supplements require an increase in insulin doses	□	□	□
11. 下列食物对于血糖的影响：The effect of the following foods on blood sugar:			
A.甜食会影响血糖水平 Sweets can affect blood sugar levels	□	□	□
B.含淀粉多的食物（如土豆、面包等）会影响血糖水平 Starchy foods (such as potatoes, bread, etc.) can affect blood sugar levels	□	□	□

C.含蛋白质多的食物（如肉、奶酪等）影响血糖水平 Protein-rich foods (such as meat, cheese, etc.) affect blood sugar levels	□	□	□
D.全脂食物对血糖的影响高于低脂食物 Whole-fat foods have a higher effect on blood sugar than low-fat foods	□	□	□
E. 75 克葡萄糖比含 75 克葡萄糖的 2 两馒头需要更多的胰岛 75 grams of glucose requires more insulin than 2 two buns with 75 grams of glucose	□	□	□
F.柚子等对血糖影响较小，因此可以随便吃 Grapefruit, etc. have less effect on blood sugar, so you can eat it casually	□	□	□
G.新鲜、不甜的果汁可以随便饮用 Fresh, unsweetened juices are free to drink	□	□	□
12. 有关食物的描述：Description of the food:			
A.糖尿病患者应该避免进食任何含糖的食物 Diabetics should avoid any sugary foods	□	□	□
B.含蛋白质食物可以大量进食 Eat protein-rich foods	□	□	□
C.油炸食物通常含有较高脂肪 Fried foods are usually higher in fat	□	□	□

条目 Items	请在相应的□内划“✓ˆ”Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 do not know
D.糕点和蛋糕含脂肪较高 Pastries and cakes are high in fat	□	□	□
E.瓜子和花生等坚果类食物可以不限量地吃 Nuts such as melon seeds and peanuts can be eaten in unlimited quantities	□	□	□
F.无糖食品如无糖的月饼或无糖点心可以多吃 You can eat more sugar-free foods such as sugar-free moon cakes or sugar-free snacks	□	□	□
G.限制盐的入量可以降低血压 Limiting salt intake can lower blood pressure	□	□	□
H.高脂肪食物增加糖尿病慢性并发症的风险 High-fat foods increase risk of chronic diabetes complications	□	□	□
I. 为糖尿病患者特制的食物可以不根据体重目标，随便	□	□	□

吃 Foods specially made for people with diabetes can eat whatever they want, regardless of weight goals			
13. 酒精制品通常：Alcohol products usually:			
A.几小时后将降低血糖水平 will lower blood sugar levels after a few hours	□	□	□
B.最初将导致血糖上升 will initially cause a rise in blood sugar	□	□	□
C.不含热量 No calories	□		□
14.如果您采用胰岛素治疗，进行下列活动： If you are on insulin, do the following: **此项用于胰岛素治疗的糖尿病患者 Diabetic patients treated with insulin**			
A.如果多喝了啤酒（窖藏啤酒、苹果酒），则需要增加胰岛素的用量以控制血糖。If you drink too much beer (lager, cider), you will need to increase your insulin dose to control your blood sugar.	□	□	
B. 如果在一顿饭中喝 1 杯白酒（或啤酒），则不需要调整胰岛素用量。If you drink 1 glass of white wine (or beer) with a meal, you don't need to adjust your insulin dosage.	□	□	□
C. 如果在晚上喝 6 个单位或以上的酒精制品，则需减少胰岛素用量以免发生夜间低血糖。If you drink 6 units or more of alcohol in the evening, reduce your insulin dose to avoid nocturnal hypoglycemia. （注：1 单位酒精＝半瓶啤酒，1 小杯白酒） (Note: 1 unit of alcohol = half a bottle of beer, 1 small glass of liquor)	□	□	
15. 长期坚持控制血糖可以降低对如下哪些器官的损害风险：Long-term adherence to blood sugar control can reduce the risk of damage to which of the following organs:			
A.足部神经 foot nerve	□	□	□
B.肾脏 kidney	□	□	□
C.眼睛 eyes	□	□	□

16. 定期检查包括：Periodic inspections include:			
A.足部神经 foot nerve	口	口	口
B.血压 blood pressure	口	口	口
C.眼睛 eyes	口	口	口
D.胆固醇水平 cholesterol level	口	口	口

条目 Items	请在相应的口内划“✓” Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 do not know
E.仅检查您发生问题的方面 Check only the areas where you have problems	口	口	口
17. 使用检眼镜（检查眼底的特殊仪器）进行眼部检查：An eye exam using an ophthalmoscope (special instrument for examining the fundus of the eye):			
A.即使糖尿病患者血糖控制很好，也需要进行此检查 This test is required even in people with diabetes who have good blood sugar control	口	口	口
B.对于仅采取饮食控制的糖尿病患者，不需要做此检查 This test is not required for diabetics on diet alone	口	口	口
C.推荐检查，因为早期发现眼底疾病并治疗可以预防失明 Tests are recommended because early detection and treatment of fundus diseases can prevent blindness	口		
18. 如果糖尿病患者吸烟：If someone with diabetes smokes:			
A.增加糖尿病严重足病截肢的风险 Increased risk of severe podiatric amputation with diabetes	口	口	
B.增加心脏疾病的发病风险 Increased risk of heart disease	口	口	口
C.增加中风的发病风险 Increased risk of stroke	口	口	口
D.与吸烟的非糖尿病患者相比，不会增加疾病风险 No increased disease risk compared to non-diabetic smokers	口	口	口

E.是一种控制体重的好方法 is a great way to control your weight	口	口	口
19. 患糖尿病后，双脚需要检查是否温暖、变色、感染、胼胝或受伤等：After diabetes, your feet need to be checked for warmth, discoloration, infection, calluses, or injuries:			
A.您或者其他人每天常规检查一遍 Routine daily check-ups for you or someone else	口	口	口
B.当穿新鞋的时候需要检查 Check when new shoes are worn	口	口	口
C.当你感觉不舒服的时候需要检查 Need to check when you're not feeling well	口	口	口
D.仅仅当你发生脚部病变的时候才检查 Check only if you have foot lesions	口	口	口
20. 关于足部护理：			
A.最好选择比实际鞋码大一码的鞋子 It is best to choose shoes one size larger than your actual shoe size	口	口	口
B.浸泡脚有好处 Benefits of soaking feet	口	口	口
C.您的脚可能受伤了但是您没有感觉到 Your foot may be hurt but you don't feel it	口	口	口
D.足部受伤后，治愈时间将比非糖尿病患者长 After foot injury, healing time will be longer than non-diabetic	口	口	口
E.如果不采取正确的护理方法，伤口容易感染 Wounds are prone to infection if proper care is not taken	口	口	口
21. 修剪脚趾甲时建议您：When trimming your toenails it is recommended that you:			
A.修剪成尖形 trimmed to a pointy shape	口		口
B.修剪成脚趾尖的形状（带圆形）Trim to the shape of the tip of the toe (with round)	口		口
22. 足部问题如：水疱、胼胝等将通过-进行安全治疗。Foot problems such as: blisters, calluses, etc. will be safely treated with ().			

条目 Items	请在相应的口内划“✓” Please tick “✓” in appropriate box		
	正确 correct	错误 incorrect	不知道 do not know
A.专业的足病医生 professional podiatrist	口	口	口
B.修脚师 pedicure	口	口	口
C.您自己 yourself	口	口	口
D.任何人 anybody	口	口	口
23. 推荐糖尿病患者使用的鞋型：Recommended shoe types for diabetics:			
A.系带的鞋子 lace-up shoes	口	口	口
B.软的跑鞋 soft running shoes	口	口	口
C.高跟鞋 High heel	口	口	口
D.露趾鞋 open toe shoes	口	口	口
E.尖头鞋 pointed shoes	口	口	口
24. 糖尿病患者足部皮肤干燥，建议：For people with diabetes who have dry skin on the feet, it is recommended to:			
A.搓脚 rub your feet	口	口	
B.脚部涂抹保湿霜到 Apply moisturizing cream to the feet	口	口	口
C.不用管它 leave it alone	口	口	
D.看专业的足病医生 See a professional podiatrist	口	口	
25. 关于糖化血红蛋白：About Glycated Hemoglobin:			
A.可发现您是否发生低血糖 to find out if you have low blood sugar	口	口	口
B. 反映过去 8-12 周的平均血糖水平 Reflects the average blood sugar level over the past 8-12 weeks	口	口	口

C. 反映过去 8-12 天的平均血糖水平 Reflects the average blood sugar level over the past 8-12 days	口	口	口
D. 反映过去 24 小时的平均血糖水平 Reflects the average blood sugar level over the past 24 hours	口	口	口
26. 我国糖尿病指南规定的糖化血红蛋白目标值：我国糖尿病指南规定的糖化血红蛋白目标值：			
A. 最高值为 6.5%The highest value is 6.5%	口	口	口
B. 最高值为 7.0%The highest value is 7.0%	口	口	口

Part 5. Diabetes Self-Efficacy Scale

Direction: This part is about your self-efficacy. Please tick √ under the number which best reflects what you actually do. Please answer every question.

糖尿病自我效能量表 **Diabetes Self-Efficacy Scale**
1. 您有信心做到每天早、中、晚三餐都在固定的时间、以固定的饭量地吃饭吗? Do you have the confidence to eat breakfast, lunch and dinner at a fixed time and in a fixed amount every day?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
2. 您在跟非糖尿病人同时进餐时,对仍坚持自己的饮食的量和种类原来吃什么还是吃什么,原来吃多少,还是吃多少,您有信心做到吗? When you eat with non-diabetic people at the same time, do you still adhere to the amount and type of your own diet, what you used to eat, how much you used to eat, how much you still eat?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
3. 当您饥饿时,您有信心挑选出合适的食物，如零食等食物吗? When you are hungry, do you have the confidence to choose suitable foods such as

snacks?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
4. 对于每次运动 15~30 分钟, 每周一次, 您有多大信心做到? How confident are you that you can exercise for 15 to 30 minutes once a week?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
5. 当您在运动时, 您有信心避免低血糖的发生吗? Are you confident that you can avoid hypoglycemia when exercising?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
6. 当您的血糖升高或降低时, 您对于做出正确的处理有信心吗? Do you feel confident that you are doing the right thing when your blood sugar rises or falls?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
7. 在您的身体发生变化时, 对于能够对身体状况做出判断从而及时就医您有信心吗? Are you confident that you will be able to make judgments about your physical condition and seek medical attention in case of changes in your body?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence
8. 对于控制您自身的糖尿病病情从而使它不影响到您的生活, 您有信心吗? Are you confident that you can control your diabetes so that it does not affect your life?
完全没有信心 1 2 3 4 5 6 7 8 9 10 完全有信心 No confidence Have full confidence

Part 6. Eating Behavior Compliance Scale for Type 2 Diabetic Patients

Direction: This part is about your situation of eating behavior. Please tick √ in the item which best reflects what you actually do. Please answer every question.

2 型糖尿病病人饮食行为依从性检测量表

Eating Behavior Compliance Scale for Type 2 Diabetic Patients

饮食行为 Eating behavior	分级 Classification				
	从不 never（1）	很少 rarely（2）	有时 sometimes (3）	经常 often (4）	总是 always（5）
饮食自我管控 dietary self-control					
1. 在觉得饿或想吃食物时依然可以管控住饮食 Control your diet when you feel hungry or want to eat					
2. 因为食品热量、含糖量或者脂肪含量过高而控制自己少吃 Control yourself to eat less because foods are high in calories, sugar, or fat					
3. 在外面和好友一起吃饭时依然可以遵照相关的饮食要求. You can still follow the relevant dietary requirements when eating out with friends.					

4. 服用降低血糖的药品或者注入胰岛素之后依然可以管控饮食 You can control your diet even after taking blood sugar-lowering drugs or injecting insulin					
5. 食用淀粉含量丰富的食品(如山药、马铃薯等)之后降低主食的摄取 Reduce the intake of staple foods after eating starch-rich foods (such as yams, potatoes, etc.)					
糖脂类依从行为 Glycolipid compliance behavior					
6. 可以限制食用木糖醇类食物 Limit the consumption of xylitol-based foods					
7. 每天乙醇饮量女病人不多于 15 g,男病人不多于 25 g(15 g 乙醇约等 于 450 mL 啤酒或者 150 mL 葡萄酒、50 mL 度数不高的白酒) The daily ethanol intake should not exceed 15 g for female patients and 25 g for male patients (15 g ethanol is approximately equal to In 450 mL of beer or 150 mL of wine, 50 mL of white wine with low alcohol concentration)					
8.吃花生米、榛子、核桃仁等干果类食品时限量在 20g 以内,相当于 10 粒杏仁合在一起的大小 When eating peanuts, hazelnuts, walnuts and other dried fruit foods, the limit is less than 20g, which is equivalent to the size of 10 almonds combined					
7.选择低脂瘦肉 Choose low-fat lean meats					

10. 每天食肉量<50 g~75 g(相当于手掌 1/4 大小及厚度) Meat consumption <50 g~75 g per day (equivalent to 1/4 of the size and thickness of the palm)					
油盐类依从行为 oil-salt compliance behavior					
11. 每天盐分摄入量<6g,并发高血压疾病的人控制在 5g 内. The daily salt intake is less than 6g, and those with hypertension are controlled within 5g					
12. 每天把食用油量限定在 25 mL 内 Limit the amount of cooking oil to 25 mL per day					
13. 限定植物油的食用量 Limit the consumption of vegetable oil					
14. 对于比较咸的食品,比方咸鸭蛋、咸菜、腊肉等要少食或不食 For salty foods, such as salted duck eggs, pickles, bacon, etc., eat less or not eat					
果蔬类依从行为 Fruit and Vegetable Adherence Behavior					
15.每天摄入 500 g 以上的蔬菜 Eat more than 500 g of vegetables per day					
16. 食用纤维含量丰富的食品,比如芹菜和魔芋等,数量是 30 g~40 g,相当于 2 颗核桃大小 Eat foods rich in fiber, such as celery and konjac, the amount is 30 g ~ 40 g, equivalent to the size of 2 walnuts					
17. 常食时令的茎类、叶类蔬菜 Eat seasonal stem and leaf vegetables					

18. 主要食物常精细配合,如在米饭里放入绿豆、养麦、玉米粒等 The main food is often carefully coordinated, such as adding mung beans, wheat, corn kernels, etc. to the rice.					
19. 血糖控制较良好时每天可吃<200g 的水果,相当于 1 个普通苹果的量 When blood sugar control is good, you can eat less than 200g of fruit per day, which is equivalent to the amount of an ordinary apple					
烹饪及进餐习惯 cooking and eating habits					
20. 采取煮、卤、汆、拌、蒸等方式做饭 Cooking by boiling, marinating, frying, mixing, steaming, etc.					
21. 吃饭过程中要细嚼慢咽,用时越长越好 Chew slowly while eating, the longer the better					
22. 每餐准时吃饭 Eat every meal on time					
23. 按规律进餐 Eat regularly					

APPENDIX B

IRB Approval

AF 06-03.1

เอกสารแสดงความยินยอม
ของผู้เข้าร่วมโครงการวิจัย (Consent Form)

รหัสโครงการวิจัย : .....
(สำนักงานคณะกรรมการพิจารณาจริยธรรมในมนุษย์ มหาวิทยาลัยบูรพา เป็นผู้ออกรหัสโครงการวิจัย)
โครงการวิจัยเรื่อง .....Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China
ให้คำยินยอม วันที่ ..... เดือน ..... พ.ศ. .....

Before giving my signature below, I have been informed by researcher, Ms. Jiali Jiang, about the purposes, method, procedures, benefits and possible risks associated with participation in this study thoroughly, and I understood all of the explanations. I consent voluntarily to participate in this study. I understand that I have the right to leave the study any time I want, without fearing that it might affect the medical services I will receive.

The researcher Ms. Jiali Jiang has explained to me that all data and information of the participants will be kept confidential and only be used for this study. I have read and understood the information related to participation in this study clearly and I am signing this consent form.

Signature ..... Participant
(.....)
Signature ..... Witness
(.....)

BUU-IRB Approved
4 Aug 2022

MHESI 8137/1242

Graduate School, Burapha University
169 Longhaad Bangsaen Rd.
Saensuk, Muang, Chonburi
Thailand, 20131

August 31th, 2022

To The president of the First Affiliated Hospital of Wenzhou Medical University,

Enclosure: 1. Certificate ethics document of Burapha University
2. Research Instruments (Try out)

On behalf of the Graduate School, Burapha University, I would like to request permission for Mrs. Jiali Jiang to collect data for testing the reliability of the research instruments.

Mrs. Jiali Jiang, ID 63910139, a graduate student of the Master of Nursing Science program (International Program) in Adult Nursing Pathway, Faculty of Nursing, Burapha University, Thailand, was approved her dissertation proposal entitled: "Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China" under supervision of Assist. Prof. Dr. Jinjutha Chaisena Dallas as the principle advisor. She proposes to collect data from 30 patients with DM type 2 at the outpatient and inpatient clinic of the Endocrinology department of the First Affiliated Hospital of Wenzhou Medical University. The participants will be recruited from who aged over 18 years old, conscious, and have no mental disorder, poor glycemic control (Glycated HbA1c level over 7%, treated with oral medication, insulin therapy and combination therapy with oral medication and insulin, and have a certain ability to write and speak Chinese. The data collection will be carried out from August 25 - 30, 2022. In this regard, you can contact Mrs. Jiali Jiang via mobile phone +86-1367-6707-261 or E-mail: 407056389@qq.com

Please do not hesitate to contact me if you need further relevant queries.

Sincerely yours,

(Assoc. Prof. Dr. Nujjaree Chaimongkol)
Dean of Graduate School, Burapha University

Carbon Copy: Ms. Hong Zhu
Director of the Endocrinology clinic

Graduate School Office
Tel: +66 3810 2700 ext. 701, 705, 707
E-mail: grd.buu@go.buu.ac.th
http://grd.buu.ac.th

MHESI 8137/1243

Graduate School, Burapha University
169 Longhaad Bangsaen Rd.
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2. Research Instruments

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Please do not hesitate to contact me if you need further relevant queries.

Sincerely yours,

(Assoc. Prof. Dr. Nujjaree Chaimongkol)
Dean of Graduate School, Burapha University

Carbon Copy: Ms. Hong Zhu
Director of the Endocrinology clinic

Graduate School Office
Tel: +66 3810 2700 ext. 701, 705, 707
E-mail: grd.buu@go.buu.ac.th
http://grd.buu.ac.th

Please type or write with readable hand writing

GRD-109 (Eng)
(Try Out)

Graduate School Burapha University

Request form for issuing a requesting letter for data collection (Try Out)

To Dean of Graduate School

I am (Mr./Mrs./Ms.) Jiali Jiang Student ID #……63910139……..

❑ Doctoral degree √ Master degree - plan ❍ A ❍ B Study type √ Full-time ❍Part-time

Program Master of Nursing Science Major/Pathway..... Adult Nursing

Faculty Faculty of Nursing Telephone +86-13676707261 E-mail 407056389@qq.com

Doctoral dissertation/ Master thesis/ IS **Title**: Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China

Principal advisor' name……Assistant Professor Dr. Jinjutha Chaisena Dallas.....

I would like to request for issuing **a requesting letter for data collection (Try Out)**:

By issuing to (name of the director of Institute/ University/ Organization)

……Ms. Hong Zhu, The Director of the Endocrinology Clinic, the First Affiliated Hospital of Wenzhou Medical University The address is Shangcai Village, Nanbaixiang Street, Ouhai District, Wenzhou City, Zhejiang Province.

To collect data from (details of participants and sample size) ……..

The participants are patients with DM Type 2 at the outpatient and inpatient clinic of the Endocrinology Department of the First Affiliated Hospital of Wenzhou Medical University. The inclusion criteria of the sample include: 1) Age > 18 years old, conscious, and have no mental disorders 2) Poor glycemic control (Glycated HbA1c level > 7%) 3) Treated with oral medication, insulin therapy and combination therapy with oral medication and insulin, 4) Have a certain ability to write and can speak Chinese. Sample size for tryout is 30 cases.

Duration of data collection: from date…25-30 August, 2022

My contact information: # cellphone and E-mail .....+8613676707261 .....E-mail: 407056389@qq.com.

With this request, I have enclosed documents 2 copies

1) A copy of proof of ethical approval from Burapha university, and
2) Research instruments

Please be informed accordingly,

Student's name ……*Jiali Jiang*……

(……Ms. Jiali Jiang ……)

Date…16… Month…August……Year…2022.

Principal advisor Acknowledged	Dean of Faculty/College acknowledged	Dean of Graduate School approved
(Signed) ..*Jinjutha Chaisena Dallas* Date…… 22 AUG 2022	(Signed)…… Date…… 22 AUG 2022	(Signed)…… (Assoc.Prof.Dr.Nujjaree Chaimongkol) Dean of Graduate School Date…… 31 August 2022

Please type or write with readable hand writing

GRD-109 (Eng)
(Main Study)

Graduate School Burapha University

Request form for issuing a requesting letter for data collection (Main Study)

To Dean of Graduate School

I am (Mr./Mrs./Ms.) Jiali Jiang Student ID #.....63910139.....

❑ Doctoral degree √ Master degree - plan ❍ A ❍ B Study type √ Full-time ❍Part-time

Program Master of Nursing Science Major/Pathway..... Adult Nursing

Faculty Faculty of Nursing Telephone +86-13676707261 E-mail 407056389@qq.com

Doctoral dissertation/ Master thesis/ IS **Title**: Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China

Principal advisor' name.....Assistant Professor Dr. Jinjutha Chaisena Dallas.....

I would like to request for issuing **a requesting letter for data collection (Main Study)**:

By issuing to (name of the director of Institute/ University/ Organization)

Ms. Hong Zhu, The Director of the Endocrinology Clinic, the First Affiliated Hospital of Wenzhou Medical University. The address is Shangcai Village, Nanbaixiang Street, Ouhai District, Wenzhou City, Zhejiang Province.

To collect data from (details of participants and sample size) .....

The participants are patients with DM Type 2 at the outpatient and inpatient clinic of the Endocrinology Department of the First Affiliated Hospital of Wenzhou Medical University. The inclusion criteria of the sample include: 1) Age > 18 years old, conscious, and have no mental disorders 2) Poor glycemic control (Glycated HbA1c level > 7%) 3) Treated with oral medication, insulin therapy and combination therapy with oral medication and insulin, 4) Have a certain ability to write and can speak Chinese. The sample size is 185.

Duration of data collection: from date from 5th September 2022 to 20th December 2022.

My contact information: # cellphone and E-mail .....+8613676707261 .....E-mail: 407056389@qq.com.

With this request, I have enclosed documents 2 copies

1) A copy of proof of ethical approval from Burapha university, and
2) Research instruments

Please be informed accordingly,

Student's name .....*Jiali Jiang*.....

(.....Ms. Jiali Jiang.....)

Date...16... Month...August.....Year...2022..

Principal advisor acknowledged	Dean of Faculty/College acknowledged	Dean of Graduate School approved
(Signed).. *Jinjutha Chaisena Dallas*	(Signed).....	(Signed).(Assoc.Prof.Dr.Nujjaree Chaimongkol)
Date..... 22 AUG 2022	Date..... 22 AUG 2022	Dean of Graduate School Date..... 21 August 2022 .....

温州医科大学附属第一医院临床研究伦理委员会审查批件

(Review of Ethics Committee in Clinical Research (ECCR) of the First Affiliated Hospital of Wenzhou Medical University)

受理编号 Acceptance Number：KY2022-125　批件号：临床研究伦审 Issuing Number (2022) 第 (125) 号

项目名称 Project	中国温州地区血糖控制不佳的2型糖尿病患者饮食行为影响因素分析 Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China		
申办者 Applicant	温州医科大学附属第一医院	试验目的 Objective	临床科研 Clinical research
试验科室 Department	内分泌科		
试验项目负责人 Principal Investigator	卢雪琴、蒋佳丽		
审查方式和时间 Form and Date	☐ 会议审查 Review Conference，时间：_____ ☑ 快速审查 Fast track，时间：2022 年 9 月 1 日		
审查地点 Review Site	新院 1-4A22 会议室		
审查材料 Documents for Review	1、医学临床科研项目及伦理审查申请表，v1.0 版； 2、临床研究方案，v1.0 版，2022.8.15； 3、受试者知情同意书，v1.0 版，2022.5.31； 4、研究者团队成员目录（职责）； 5、主要研究者、团队成员简历及 GCP 证书，v1.0 版； 6、研究者责任声明； 7、CRF/临床观察表，v1.0 版。		
审查意见 Comments	根据国家卫健委《涉及人的生物医学研究伦理审查办法》(2016)、WMA《赫尔辛基宣言》和 CIOMS《人体生物医学研究国际道德指南》的伦理原则，经本伦理委员会审查，同意该项目开展。 According to the Regulations and Rules of "Ethical Reviews for Biomedical Research Involving Human Subjects" (2016) the National Health Commission of PRC , "Declaration of Helsinki" of WMA, and "International Ethical Guidelines for Human Biomedical Research" of CIOMS , the project was **approved** by **ECCR** .		
主任委员/副主任委员签字 Signature of the **ECCR** Chair	陈之杉	签发日期 Date	2022.9.4
温州医科大学附属第一医院临床研究伦理委员会（盖章） Ethics Committee in Clinical Research of the First Affiliated Hospital of Wenzhou Medical University (Seal)			

附注（Note）：

1. 临床研究应在批准之日起1年内实施，逾期未实施，本批件自行废止。临床研究过程中将接受伦理委员会的跟踪审查，审查频度为自批准之日起每12个月一次。（伦理委员会有权根据临床试验实际开展情况改变跟

版本日期：2021 年 06 月 21 日

按审查频度）

The clinical study shall be implemented within 1 year from the date of approval. If overdue, the approval for this project shall be revoked. During the implementation of clinical research, tracking review will be conducted by **ECCR** every 12 months from the effective date of the initial approval (the ethics committee has the right to change the frequency of tracking review according to the actual implementation of clinical trials)

2. 请严格遵从已批准的研究方案，如果方案修改需以书面形式报告伦理委员会，经伦理委员会批准后方可执行。
Please strictly follow the approved research protocol. Any revisions of the protocol must be reported to **ECCR** in written form. It can be conducted only after the modification was approved by **ECCR**.

3. 发生严重不良事件以及影响研究风险受益比的非预期不良事件，须在24小时内报告本伦理委员会。
Serious adverse events and unanticipated adverse events that affect the risk-to-benefit ratio of the project must be reported to **ECCR** within 24 hours.

4. 暂停、方案违背或提前终止临床研究，请及时上报本伦理委员会。
Any suspension, project violation or early termination of the clinical research, should be reported to **ECCR** promptly.

5. 完成临床研究，须提交研究完成报告给本伦理委员会。
Please submit a completion research report to **ECCR** after completion of the project.

版本日期：2021 年06 月21 日

温州医科大学附属第一医院临床研究伦理委员会委员签到表

会议时间：2022 年 9 月 1 日

会议地点：新院 1-4A22 会议室

审查内容：中国温州地区血糖控制不佳的 2 型糖尿病患者饮食行为影响因素分析 Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China

姓 名	性别	工作单位	专 业	职 称	伦理委员会职务	签到
陈咨苗	男	温州医科大学附属第一医院	内分泌科	副主任医师	主 任	／
黄晓颖	女	温州医科大学附属第一医院	呼吸内科	教授/主任医师	副主任	／
蔡雪黎	女	温州医科大学附属第一医院	心内科	副教授/副主任医师	委 员	／
徐 卫	男	温州医科大学附属第一医院	预防医学	副主任医师	委 员	／
孙彩霞	女	温州医科大学附属第一医院	护 理	主任护师	委 员	孙彩霞
卢明芹	男	温州医科大学附属第一医院	感染科	主任医师	委 员	／
陈 雷	男	温州医科大学附属第一医院	骨 科	教授/主任医师	委 员	／
郑祥武	男	温州医科大学附属第一医院	放射影像	教授/主任医师	委 员	／
林观样	男	温州医科大学附属第一医院	药 学	主任药师	委 员	／
俞 康	男	温州医科大学附属第一医院	血液内科	教授/主任医师	委 员	／
陈永平	男	温州医科大学附属第一医院	感染科	教授/主任医师	委 员	／
张秀华	女	温州医科大学附属第一医院	临床研究中心	主任药师	委 员	／
苏小芳	女	浙江震瓯律师事务所	法 律	律 师	委 员	苏小芳
胡建芬	女	退 休	统计学	高级统计师	委 员	／
方 耀	男	温州理工学院	伦理学	讲 师	委 员	／

伦理委员会声明：

★ 温州医科大学附属第一医院临床研究伦理委员会组成及工作程序遵循中国 GCP、ICH-GCP 及相关法律法规，其审查过程不受伦理委员会以外任何组织及个人影响。

★ 本伦理委员会各委员已签署保密协议，所有标准操作规程文件、机密信息、会议记录等及其副本的所有权均归伦理委员会。

地址：浙江省温州市瓯海区南白象温州医科大学附属第一医院新院区 邮编：325000
联系电话：0577-55578055 传真：0577-55578033 E-mail:wyyyclinical@126.com

AF 06-02

เอกสารชี้แจงผู้เข้าร่วมโครงการวิจัย
(Participant Information Sheet)

รหัสโครงการวิจัย : ... **G-HS038**/2565.....
(สำนักงานคณะกรรมการพิจารณาจริยธรรมในมนุษย์ มหาวิทยาลัยบูรพา เป็นผู้ออกรหัสโครงการวิจัย)
โครงการวิจัยเรื่อง : Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China

Dear participants

I am Ms Jiali Jiang, a student in Master of Nursing Science (International Program) Faculty of Nursing, Burapha University Thailand. My study is "Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China". Objective: to investigate the dietary behaviors of patients with type 2 diabetes mellitus with poor blood sugar control in Wenzhou City. And to explore the factors (social support, diabetes knowledge, fear of hypoglycemia, self-efficacy) that influence the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou City.

This study will be an investigative study. Participation in this study is voluntary. If you agree to participate in this study, you will answer the following questionnaire, which will take approximately 15-20 minutes. During data collection, researchers will clarify any questions the participants asked to clarify language or content. There will be no direct benefit from participating in this study. However, the information you provide is invaluable for identifying factors that influence the eating behaviors of people with type 2 diabetes who have poor glycemic control. By understanding the factors that influence the eating behaviors of patients with type 2 diabetes who have poor glycemic control, and addressing these barriers, staff can develop solutions to improve patients' eating behaviors, thereby improving glycemic control and improving their quality of life. There will be no identified physical and psychological risks for those who take part in the study, and no risk to society.

During the study, you have the right not to answer questions, and you also have the right to change your minds and refuse to participate in the project at any time, and the refusal would not affect the medical services you received. Any information collected from this study, including your identity, will be kept confidential. A coding number will be assigned to you and your name will not be used. Findings from the study will be presented as a group of participants and no specific information from any individual participant will be disclosed. All data will be accessible only to the researcher which will be destroyed one year after publishing the findings. You will receive a further explanation of the nature of the study upon its completion, if you wish.

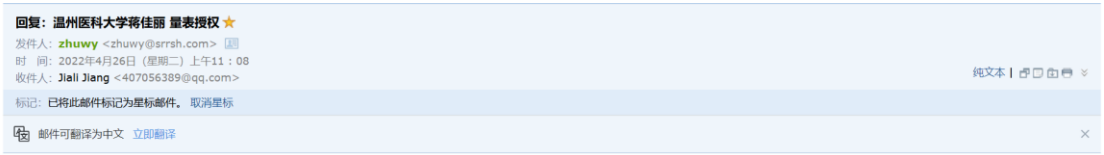
For human subject protection of COVID-19 infection, at the endocrinology outpatient department, the patients and the researcher will wear masks throughout the process, undergo temperature screening, and present a health QR code (the official way of reporting residents' health status). Patients with a green code and a body temperature below 37.3℃ will be admitted to the outpatient department. The outpatient department will be routinely disinfected every day. The patient and the researcher need to disinfect hands with quick hand disinfectant or wash hands with alcohol or disinfectant solution before and after the interview. The patient and the researcher need to maintain a safe distance of at least 1 meter. The pens and other objects will be cleaned and disinfected before being handed over to the patient.

The research will be conducted by Ms. Jiali Jiang under the supervision of my major-advisor, Assistant Prof.Dr. Jinjutha Chaisena Dallas. If you have any questions, please contact me at mobile number: + 86 13676707261 or by email 407056389@qq.com and/or my advisor's e-mail address jinjutha@buu.ac.th. Or you may contact Burapha University Institutional Review Board (BUU-IRB) telephone number 038 102 620. Your cooperation is greatly appreciated. You will be given a copy of this consent form to keep.

Jiali Jiang

APPENDIX C

Permission for using instruments



回复：温州医科大学蒋佳丽 量表授权 ★

发件人：**zhuwy** <zhuwy@srrsh.com>
时　间：2022年4月26日（星期二）上午11：08
收件人：**Jiali Jiang** <407056389@qq.com>

纯文本 |

标记：已将此邮件标记为星标邮件。 取消星标

邮件可翻译为中文 立即翻译

可以的。

---原始邮件---

发件人: "Jiali Jiang"<407056389@qq.com>
发送时间: 2022年4月26日(周二) 上午10:32
收件人: "zhuwy"<zhuwy@srrsh.com>;
主题: 温州医科大学蒋佳丽 量表授权

朱伟燕老师，您好，我是温州医科大学护理学院的学生蒋佳丽，目前就职于温州医科大学附属第一医院内分泌科。我的硕士毕业论文"Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China "，需要借用您的"中文版糖尿病患者知识量表"，希望得到您的同意和授权。期待您的回复，谢谢!

Hello, Ms.Weiyan Zhu, I am Jiali Jiang, a student at the School of Nursing of Wenzhou Medical University. I am currently working in the Endocrinology Department of the First Affiliated Hospital of Wenzhou Medical University. For my master's thesis "Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China", I need to borrow your "Chinese version of the Knowledge Scale for Diabetic Patients" and hope to get your consent and authorization. Looking forward to your reply, thank you!

RE: Burapha University ☆

发件人：**lorig** <lorig@stanford.edu>
时　间：2023年3月18日（星期六）上午0：24
收件人：**Jiali Jiang** <407056389@qq.com>

纯文本 |

邮件可翻译为中文 立即翻译

You have our permission to use and translate this scale. Please send us a copy of the translated scale. It has been used widely for type II.
Kate Lorig DrPH
Professor Emerita
Stanford University School of Medicine

From: Jiali Jiang <407056389@qq.com>
Sent: Friday, March 17, 2023 4:55 AM
To: Kate R Lorig <lorig@stanford.edu>
Subject: Burapha University

Dear professor Kate:
I, Ms.Jiali Jiang, study in Master of Nursing Science Program at Burapha University, Thailand. My research title is Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China. Associate Professor Dr. Chintana Wacharasin is my advisor. I learn that your questionnaire （Diabetes self-efficacy Scale） is appropriate to measure Self-efficacy in patients with type 2 diabetes mellitus with poor glycemic control in my study. I would like to ask your permission to translate the questionnaire into Chinese language and use for my research. Thank you very much for your consideration. I am looking forward to hearing from you soon."

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中文版低血糖恐惧调查 ★

发件人：青梅 <969672386@qq.com>
时　间：2022年4月27日（星期三）下午1：10
收件人：Jiali Jiang <407056389@qq.com>
附　件：2 个（中文版低血糖恐惧调查.docx...）

纯文本 |

标记：已将此邮件标记为星标邮件。 取消星标

您好，很高兴我们翻译的量表能对您的研究有帮助，并且很愿意和您一起分享量表内容，希望您使用后可以和我们共享该量表的数据，以便后续验证量表的结构，如果您同意的话，希望签署量表使用承诺书，拍照或扫描发给我，然后使用该量表。承诺书和量表见附件，祝科研顺！

附件(2 个)

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Re: 温州医科大学蒋佳丽 量表授权 ★

发件人：xiaosy <xiaosy@csu.edu.cn>
时　间：2022年4月27日（星期三）下午8：15
收件人：Jiali Jiang <407056389@qq.com>

纯文本 |

标记：已将此邮件标记为星标邮件。 取消星标

邮件可翻译为中文 立即翻译

没问题的

From: Jiali Jiang
To: 802377
CC:
Date: 2022-4-26 10:35
Subject: 温州医科大学蒋佳丽 量表授权

肖教授，您好，我是温州医科大学护理学院的学生蒋佳丽，目前就职于温州医科大学附属第一医院内分泌科。我的硕士毕业论文"Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China "，需要借用您的"社会支持量表"，希望得到您的同意和授权。期待您的回复，谢谢!

Hello, Professor Xiao, I am Jiali Jiang, a student at the School of Nursing of Wenzhou Medical University. I am currently working in the Endocrinology Department of the First Affiliated Hospital of Wenzhou Medical University. For my master's thesis "Factors influencing the eating behavior of patients with type 2 diabetes mellitus with poor glycemic control in Wenzhou, China", I need to borrow your "social support scale" and hope to get your consent and authorization. Looking forward to your reply, thank you!

BIOGRAPHY

NAME	Jiali Jiang
DATE OF BIRTH	19 April 1987
PLACE OF BIRTH	China
PRESENT ADDRESS	Room 901, Building 17, Kaiyu Garden, Xishan South Road, Lucheng District, Wenzhou City, Zhejiang Province, China
POSITION HELD	Sudent/Nurse
EDUCATION	Bachelor of Nursing Wenzhou Medical University