

CHAPTER II

THEORETICAL REVIEW

A. Basic Concepts of Diabetes Mellitus

1. Definition of Diabetes Mellitus

DM is a disorder of carbohydrate, protein and fat metabolism resulting from an imbalance between the availability of insulin and the need for insulin. These disorders can be in the form of absolute insulin deficiency, impaired insulin excretion by pancreatic cells, inadequacy or damage to insulin receptors, inactive insulin production and insulin damage before labor. DM is a chronic, progressive disease characterized by the body's inability to metabolize carbohydrates, fats, and proteins early on the occurrence of hyperglycemia (high blood sugar levels) (Sell et al., 2023).

According to the IDF, DM is a chronic disease caused by the body's ineffective insulin delivery or lack of insulin production by the pancreas. The pancreas secretes the hormone insulin, which is responsible for facilitating the transfer of glucose from food to the circulation and into the body's cells to be converted into energy (Sun et al., 2022).

DM is an increase in blood glucose levels from the normal fasting rate range of 80-90 mg/dl, or the non-fasting range of 140-160 mg/dl. If diabetes mellitus is not treated quickly, it can lead to complications such as blurred vision, heart disease, kidney disease, and disorders of the skin and nerves (Alfreyzal et al., 2024).

2. Classification of Diabetes Mellitus

According to Hartono and Ediyono (2024). DM is classified into several general categories which are as follows:

a. Type 1 Diabetes Mellitus

Type 1 DM occurs when the pancreas cannot make enough insulin for the body, or if there is none at all, sugar builds up in the bloodstream because it cannot be transported into the cells. Type 1 DM is this condition. Type 1 DM usually appears in children or adolescents, and can

be diagnosed in both men and women. The symptoms often appear quickly, and if not treated with insulin injections immediately, the condition can become so severe that the sufferer falls into a coma.

b. Type 2 Diabetes Mellitus

It is the most common type of DM, with 90-95% of sufferers being over 40 years old. However, this DM can also appear in children or adolescents. Type 2 diabetes although the pancreas can still make insulin, it is of poor quality and does not function properly, which leads to an increase in blood sugar. Although patients don't usually need insulin injections, they should take oral medications, or tablets, that work to improve insulin function, reduce the amount of sugar in the blood, and improve how the liver processes sugar.

c. Gestational Diabetes

Gestational diabetes is a condition caused by the development of hormones in pregnant women, which leads to insulin resistance. Gestational DM can be diagnosed in the second or third trimester of pregnancy without obvious symptoms of gestational DM.

d. Other Types of Diabetes

Secondary DM or as a result of another disease is another diabetes that does not fall into the above group. This DM interferes with insulin production or affects the work of insulin. Disorders of the adrenal or pituitary glands, use of corticosteroid hormones, use of some antihypertensive or anticholesterol drugs, malnourishment, or infections are some examples.

3. Risk Factors

Factors that affect DM patients are *Self-Care Management* may reduce its important role in maintaining metabolic stability and preventing complications. In addition, another factor that also affects the condition of diabetic patients is the quality of sleep (*sleep quality*). Poor quality sleep can have an impact on increased levels of stress hormones and insulin resistance, which ultimately worsens glycemic control. Sleep disorders can also reduce

an individual's motivation and ability to take care of themselves optimally. These two factors, namely the ability to *Self-Care Management* and sleep quality, contributing significantly to the quality of life of patients with diabetes mellitus. Quality of life reflects the extent to which patients are able to adapt physically, psychologically, and socially in dealing with the chronic conditions they experience. Thus, the discussion of *Self-Care Management*, *sleep quality*, and quality of life is important to understand how these factors are interrelated and affect the success of comprehensive diabetes mellitus management (Ernawati et al., 2024).

According to Mato et al., (2023), there are several factors that can affect DM as follows:

a. Type 1 DM

1) Genetic/Hereditary Factors

People with Type 1 DM do not inherit DM itself, but inherit a genetic predisposition toward the occurrence of the condition. This genetic predisposition is found in individuals who have a *specific* type of Human Leucocyte Antigen (HLA) antigen.

2) Immunological Factors

An unusual autoimmune response causes antibodies to attack ordinary tissues that are considered foreign.

3) Environmental factors

Certain toxins or viruses can trigger pores that can cause beta cell damage.

b. Type 2 DM

The risk factors associated with type 2 DM are as follows:

1). Obesity

Due to obesity, the number of insulin receptors in the body decreases, which means the effectiveness of insulin decreases to increase metabolic effects.

2). Age

A person's susceptibility to DM increases with age, and this tendency tends to increase after the age of 65. This age component is directly related to the physiology of the body, where physiological processes decline with age. Similarly, when the hormone insulin does not function properly, blood sugar levels rise.

Age-related physiological changes may make it harder for the body to get rid of glucose. Thus, it can be said that a person's age increases his chances of developing diabetes mellitus. A person's physical, psychological, and cognitive abilities decline with age, causing changes in him (Nistiandani et al., 2023).

3). Family History

If there is a family member who has DM, the chances of a person suffering from DM increase.

4). Ethnic groups

Certain ethnic types have a higher risk of suffering from type 2 DM, which can be caused by a variety of genetic, environmental and lifestyle factors.

4. Pathophysiology

The pathophysiology of the occurrence of DM can occur through two conditions, namely, insulin resistance and pancreatic B cell dysfunction. The cause of type 2 DM is the failure of insulin target cells to respond to insulin normally. This condition is a condition known as insulin resistance. The occurrence of insulin resistance is caused by the incidence of obesity, low physical activity, and a person's age. Hepatic glucose production in patients with type 2 diabetes exceeds normal levels without autoimmune damage to the langerhans B cells. Decreased insulin function in patients with type 2 diabetes is relative and non-absolute. At the beginning of the development of type 2 diabetes, B cells signal the presence of a first-phase insulin secretion disorder, which means that there is a failure of insulin secretion to compensate for insulin resistance. Poor handling will cause

damage to pancreatic B cells. This damage will occur progressively and is generally the cause of insulin deficiency, so sufferers need exogenous insulin. In patients with type 2 diabetes, these two factors usually occur, in the form of insulin resistance and insulin deficiency (Fatmona et al., 2021).

The types of DM are divided into four, namely type I DM, type II DM, gestational DM, and other types of DM. All four are conditions with high blood sugar levels in the blood. However, the pathophysiology between the four is different. Type 1 DM occurs due to damage to the pancreatic B cells themselves so that insulin production by pancreatic B cells is disrupted. This can occur due to an autoimmune reaction in the body as a result of inflammation that occurs in pancreatic B cells. This gives rise to 1268 antibodies against pancreatic B cells called *Islet Cell Antibody* or abbreviated as ICA. The reaction of antigens (B cells) with ICA antibodies leads to the destruction or destruction of pancreatic B cells. In type II diabetes, it occurs due to damage or interference with insulin receptors so that insulin function is disrupted. Basically, the insulin hormone produced by pancreatic B cells is normal or increased in the body, but due to insulin receptors being resistant or disrupted on the cell surface, there is less glucose that should enter the cell. Glucoses that should be able to enter the cells remain in the blood vessels, as a result of which the blood sugar level increases. Furthermore, gestational DM occurs due to hormonal changes during pregnancy that lead to increased resistance to the action of insulin. During pregnancy, the placenta produces various hormones such as estrogen, progesterone, cortisol, *Human Placental Lactogen* (HPL), and prolactin. These hormones function to support fetal growth, but physiologically they also inhibit the work of insulin so that the mother's blood glucose levels remain sufficient to meet the energy needs of the fetus. Other types of DM are caused by various conditions or specific factors outside of type 1, type 2, and gestational DM. Its pathophysiological mechanism depends on the underlying cause. One form that falls into this category is a genetic disorder of pancreatic B cell function, such as *Maturity*

Onset Diabetes of the Young (MODY), which is caused by a genetic mutation in a gene that regulates insulin production and secretion, resulting in a decrease in the ability of pancreatic B cells. (Sagita et al., 2020).

5. Clinical Manifestations

According to Hadrianti et al., (2022) The clinical manifestations of DM are as follows:

- a. Polyuria is an excessive volume of sweet urine. The threshold for the kidneys to "remove" sugar particles from the blood into the urine is about 180 mg/dl. Once blood sugar reaches about 180 mg/dl, the kidneys can no longer absorb sugar particles, causing the excretion of glucose in the urine. The kidneys begin to excrete sugar particles, but when sugar is excreted, the volume of fluid is also released, resulting in polyuria.
- b. Polydipsia is excessive thirst. Thirst is the compensatory mechanism that accompanies polyuria. The body is trying to replace the volume of fluid lost due to excessive diuresis.
- c. Polyphagia is excessive hunger. Brain cells are very hungry because the sugar in the blood cannot move from serum to cell and brain cells need a constant supply of glucose.
- d. Weight loss is due to blood glucose that accumulates in the blood and cannot be converted into energy, so the body has to burn fat as an energy reserve.
- e. Wounds that do not heal (*diabetic ulcers*) are caused by damage to blood vessels due to excess glucose covering arterial veins. DM reduces the ability of *endothelial progenitor* cells or *EPCs* to allocate injuries and help blood vessels heal wounds.
- f. Loss of leg stipend (*diabetic neuropathic*) is a condition of the neck or hand such as tingling and numbness along with nerve damage due to high blood glucose levels over a long period of time. Such nerve damage affects sensory, and autonomic nerves.

6. Complications of Diabetes Mellitus

DM complications can be divided into two major categories, namely acute metabolic complications and long-term chronic complications. Acute metabolic complications are caused by relatively acute changes in plasma glucose concentration. The most serious metabolic complication in type 1 diabetes is *diabetic ketoacidosis* (KAD).

a. Acute Complications

Complications of matoblik DM are caused by relatively acute changes in plasma glucose contraction. CARDS is the most severe metabolic complication in type 1 DM. The most serious metabolic complication in type-1 DM is KAD. If insulin levels drop drastically, the patient will experience significant hyperglycemia and glucosuria, decreased lipogenesis, increased liposis and increased oxidation of free fatty acids. All this is accompanied by the fixation of ketone bodies, which causes type 2 DM (Astuti et al., 2023).

b. Hypoglycemia

Hypoglycemia is a common feature of type 1 DM and is also found in clients with type 2 DM treated with insulin or oral medications. If the patient's blood glucose level $< 50 - 60$ mg/dl, symptoms of hypoglycemia will appear (Nurjannah & Asthiningsih, 2023).

c. Diabetic Ketoacidosis

KAD occurs due to excess glucose levels in the blood while insulin levels in the body are greatly decreased resulting in metabolic disorders, characterized by hyperglycemia, acidosis, and ketosis (Ariadi et al., 2024).

d. Microangiopathy

Microangiopathy is a condition in which smaller blood vessels thicken and weaken, thus inhibiting blood flow throughout the body, gradually this condition leads to an increased risk of DM retinopathy (which can lead to blindness and kidney disease) (Suryanti & Pudjiati, 2025).

e. Diabetic Foot

Diabetic foot is a condition in which blood glucose levels are too high which leads to nerve damage. As a result, people with DM cannot feel unusual pain or sensations when their legs are injured, so the wounds experienced by the sufferer become more severe and less well maintained.

f. Coronary Heart Disease

Coronary insufficiency or angina pectoris is a consequence of a disorder of the coronary arteries. Paroxysmal pain such as being crushed by heavy objects is felt in the lower jaw, shoulders, arms, and wrists. This pain appears when moving or emotion and will subside after resting or receiving sublingual nitrates

g. Autonomic and Motor Complications

The initial process of vascular abnormalities is the presence of atherosclerosis, which can occur in all blood vessels (Kurniawan & Yanni, 2020).

h. Stroke

DM has the second most frequent cause of death, cerebral atherosclerosis. About one-third of people who have had a stroke also have DM (Ministry of Health of the Republic of Indonesia, 2020).

i. Coronary Metabolic Complications

In the form of damage to large blood vessels (macrovascular) such as coronary heart and cerebrovascular disease, damage to the kidneys (diabetic nephropathy), and damage to nerves (diabetic neuropathy). Damage to small blood vessels (microvascular) including retinopathy (Saputri, 2020).

7. Diabetes Mellitus Supporting Examination

According to *the American Diabetes Association* (ADA) (2020), there are three different types of blood glucose tests:

a. Blood Glucose During Time (GDS)

The results of blood glucose tests taken momentarily for one day without taking into account the time of the last meal.

b. Fasting Blood Glucose

Blood glucose checks are performed on patients who have fasted for at least 8 hours without consuming calories.

c. Blood Glucose Levels 2 Hours PP (2 hours after meals)

According to the Indonesian Endocrinology Association (PERKENI) (2015), the supporting examinations for DM are as follows:

- 1) Fasting plasma glucose test >126 mg/dL. Fasting is a condition in which there is no intake for at least 8 hours. Normal values <100 mg/dL indicate good blood glucose regulation and normal insulin function. Prediabetes (fasting glucose disorder): $100\text{--}125$ mg/dL indicates impaired glucose tolerance or early insulin resistance that increases the risk of developing type 2 diabetes mellitus.
- 2) Plasma glucose test >200 mg/dL 2 hours after the Oral Glucose Tolerance Test (TTGO) is a laboratory test used to assess the body's ability to metabolize glucose after oral glucose loading, with a glucose load of 75 grams.
- 3) Plasma glucose testing is a measurement of blood glucose levels that is carried out without paying attention to the last time of the meal. This test reflects blood glucose levels at a given moment and is used to assess the condition of acute hyperglycemia. Plasma glucose test at >200 mg/dL with classic complaints.
- 4) HbA1c examination $\geq 6.5\%$ using the *National Glycohaemoglobin Standardization Program* (NGSP) method is a laboratory method used to assess average blood glucose levels in the last 2–3 months. This test measures the percentage of hemoglobin that is glycosylated non-enzymatically due to prolonged exposure to blood glucose. Normal values: $<5.7\%$ indicate mean blood glucose levels within physiological limits and a low risk of developing DM. Prediabetes

(high risk of diabetes): 5.7–6.4% indicates mild chronic elevated blood glucose levels that reflect impaired glucose tolerance or insulin resistance. DM: $\geq 6.5\%$ The HbA1c value $\geq 6.5\%$ obtained by the NGSP method is a diagnostic criterion for DM. These results show a chronic increase in blood glucose levels due to impaired insulin secretion, insulin resistance, or a combination of both.

Table 2. 1 Blood Laboratory Test Rates for Diabetes and Prediabetes Diagnosis

	HbA1c (%)	Fasting Blood Glucose	Plasma Glucose 2	Current Blood Glucose
Normal	<5.7	<100	<140	<140
DM	>6.5	>125	>200	>200
Prediabetes	5,7-6,4	100-125	140-199	140-199

Source : (PERKENI, 2015)

8. Management of Diabetes Mellitus

a. Education

Education conducted for DM is needed for optimal management of diabetes that requires behavioral changes from diabetes. Education with the aim of promoting healthy living needs to always be carried out as part of prevention efforts and is a very important part of holistic management in an important way. (Saibi et al., 2020).

The educational material consists of initial level educational materials and advanced level educational materials. Medication adherence is the extent to which a person's behavior is taking medication, following a diet, and/or making lifestyle changes, in accordance with the 2003 recommendations agreed upon by WHO health care providers. Compliance is one of the most important factors in the success of a patient's therapy, including type 2 DM patients. Compliance is an issue that needs attention in type 2 DM patients. Various studies have reported low adherence in such patients. (Ramdini et al., 2023).

b. Food Planning

The general goal of nutritional therapy is to help DM patients improve their nutritional habits and is aimed at controlling blood sugar, fat and hypertension. Meal planning should contain enough nutrients, meaning setting enough portions throughout the day. With 3J: Amount, Type, Schedule.

c. Physical Activities

The benefits of physical activity (exercise) in DM patients are regulating blood sugar levels, losing weight and body fat, and maintaining fitness. During exercise, insulin resistance will decrease and insulin sensitivity will increase. This kind of response only occurs when exercising. The principle of diabetic exercise is (F.I.T.T)

Table 2. 2 Principles of Diabetes Exercise F.I.T.T

<i>Frequency</i>	:	Number of exercises per week (regularly 3-4 times per week)
<i>Intensity</i>	:	100 steps per minute, with an average speed of 4-6 km/min
<i>Time</i>	:	15-30 minutes
<i>Type</i>	:	Cardio Workouts

Sources: (Scott, 2022)

d. Pharmacological Management

Pharmacological therapy with insulin treatment and anti-diabetic drugs with initial therapy administering insulin at a dose of 0.25 units/kgBB subcutaneously and will continue to increase according to the condition and needs of DM patients. Pharmacological therapy must also be accompanied by adequate diet and activity. Maintaining a healthy diet and doing regular physical activity is very important for people with DM.

B. Quality of Life Concept

1. Definition of Quality of Life

Quality of life or *Quality Of Life* (QOL) is an individual's perception of their position in life in the context of the culture and values in which they live and in relation to life goals, expectations, standards and concerns. It is a broad concept that affects a person's physical health, psychological state, level of dependence, social relationships, personal beliefs and their relationship to future desires for their environment (Anggraini, 2021).

2. Factors That Affect Quality of Life

According to Melinda (2024). There are various factors that can affect the quality of life of DM patients, including:

a) Factors of Suffering from Diabetes Mellitus

The length of the disease has a great effect on the quality of life of DM sufferers. Over time, damage to pancreatic beta cells can result in worsening glucose control (Sofia et al., 2023).

b) Age Factor

Age factors also play an important role, older age is often associated with a decline in overall body function and can affect the management of DM. Generally, quality of life decreases with age. Older people with DM will experience a decrease in quality of life because usually their physical condition has declined (Baqri et al., 2021).

c) Employment Factors

Work can be a factor that affects the quality of life of patients. Generally, DM patients will experience various complaints that cause difficulties in work. In addition, education as one of the characteristics of patients that can be associated with the quality of life of DM patients. Education will designate patients to choose DM treatment, also allowing patients to control their entire diet and adhere to the treatment program (Masliati et al., 2022).

d) Gender Factors

Gender factors have a significant impact on the quality of life of DM patients. Gender is one of the physiological and psychological differences between men and women can affect the way each individual faces and manages diseases, gender differences will affect the physiological and psychological functions of individuals so that they will have an impact on the quality of life of individuals.

3. Causes of Decreased Quality of Life

Deterioration in quality of life in DM patients is multifactorial, involving a combination of biological, psychosocial, and environmental factors

a. Physical Factors and Chronic Complications

One of the main causes of decreased quality of life in DM patients is the appearance of chronic complications due to poor blood glucose control. Microvascular complications such as retinopathy, nephropathy, and diabetic neuropathy as well as macrovascular complications such as coronary heart disease and stroke lead to decreased bodily function, pain, limited mobility, and dependence on others (Alzahrani et al., 2023).

b. Psychological Factors

DM patients often experience significant emotional burdens, including chronic stress, anxiety, and depression, which contribute to a decline in quality of life. This condition is referred to as *Diabetic distress*, which is psychological stress due to the demands of disease management that must be carried out every day (Nur Widayati et al., 2024).

c. Social and Economic Factors

Social and economic aspects also affect the QoL of DM patients. Individuals with low incomes, limited education, and minimal social support are at greater risk of decreased QoL (Chong et al., 2024).

d. Behavioral and *Self-Care Factors*

Self-care behaviors (*Self-care behavior*) such as healthy diet, regular exercise, adherence to drug therapy, and blood glucose monitoring

greatly determine the patient's quality of life. Low level *self-efficacy* (self-confidence in managing the disease) makes it difficult for patients to maintain good glycemic control (Alshaikhi et al., 2025).

e. **Lifestyle and Comorbidities**

In addition to the above factors, unhealthy lifestyles such as lack of physical activity, smoking habits, obesity, and the presence of comorbidities such as hypertension and dyslipidemia, worsen the clinical condition of DM patients (Pérez-Ortiz et al., 2025).

f. **Sleep *Quality***

Sleep quality is one of the important factors that is often overlooked but has a big impact on the QoL of DM patients. Sleep disorders such as insomnia, *sleep apnea*, and poor sleep often occur due to fluctuations in blood glucose levels, peripheral neuropathy, or anxiety about disease conditions. (Almeida et al., 2023).

4. Quality of Life Measurement

Quality of life in DM patients can be measured using *World Health Organization Quality of Life- BREF (WHOQOL- BREF)* to lower the domain score by four. The four domain scores show an individual's perception of the quality of life in each given domain. The score domain scales in a positive direction (i.e. a higher score indicates a higher quality of life). It's usually like an index coverage between 0 (dead) and 1 (perfect health). All scales and single factors were measured in a vulnerable score of 0-100 i.e. very poor score: 0-21, poor: 22-42, medium: 43-63, good: 68-84, very good: 85-104. A high scale value represents a higher response rate. (Tumanggor, 2019).

5. Quality of Life Management

Improving the quality of life of DM patients requires a holistic and multidisciplinary approach, which not only focuses on glycemic control but also includes education, behavior change, psychosocial support, sleep interventions, and patient empowerment. Strategies are as follows:

a. Education and *Self-Management* (Self-Management)

Patient education and self-management interventions have been shown to significantly improve QoL in type 2 DM patients. A systematic review shows that programs like *DM Self-Management Education (DSME)* and family involvement has a positive effect on QoL. Self-management interventions include glucose monitoring, therapy adherence, physical activity, and diet. The results improve *self-efficacy* patients and improve their perception of their disease (Rismayani et al., 2025)

b. *Peer Support* and Community

Peer support interventions as part of DM management programs have been shown to improve QoL, self-management effectiveness, and glycemic control. A systematic review noted that *Peer Support* significantly improve quality of life in type 2 DM patients. Community-based approach (*community-based intervention*) also shown effectiveness in improving healthy behaviors and QoL, particularly in developing countries (Lutfian et al., 2025).

c. Lifestyle Interventions: Diet, Physical Activity and Sleep

1) Physical activity and diet: Interventions based on behavior change theories (such as the Transtheoretical Model) that integrate diet and physical exercise show improved glycemic control and potential for increased QoL (Darmawan, 2022)

2) Sleep quality: Sleep disturbances are a factor that negatively impacts the QoL of DM patients and interventions such as *Cognitive Behavioral Therapy (CBT)* for sleep disorders has been shown to improve sleep quality and QoL in patients with type 2 diabetes (Irbar et al., 2023)

d. Psychosocial and Motivational Approaches

Interventions based on motivational theories such as *SelfDetermination Theory (SDT)* or strengthening psychological resilience has been shown to contribute to increasing the QoL of DM patients. One systematic

review showed that SDT interventions compared to usual treatments improved QoL and reduced *Diabetic distress* (Mathiesen et al., 2023)

e. **Healthcare Integration and Multidisciplinary Coordination**

Coordination between health teams that include doctors, nurses, nutritionists, psychologists, and public health workers is key to running an ongoing intervention that includes education, treatment, monitoring, and social support. A narrative study of nursing interventions in DM patients with renal failure emphasizes the importance of holistic interventions to improve QoL (Shammari et al., 2024).

C. Concept of Self-Care Management

1. Definition of Self-Care Management

Self care Management is the implementation of individual activities related to the fulfillment of needs in maintaining life, health and welfare. If self-care can be done effectively, it can help individuals in developing their potential. According to Hidayah (2019) *Self-Care Management* DM is an action taken by individuals to control DM including treatment and prevention of complications. Some aspects included in *Self-Care Management* are dietary regulation, physical activity/exercise, blood sugar monitoring, medication adherence (Ayunda et al., 2023).

According to *Dorothea Orem's Theory of Self Care*, the view in the nursing service order is shown to the needs of individuals in carrying out independent nursing actions and managing their needs. In the concept of nursing practice, Dorothea Orem developed the theory of self-care into several types, namely;

a. **Self-care**

- 1) *Self-care* is an activity and initiative of individuals in fulfilling and maintaining life, health, and welfare.
- 2) *Self-care anxiety* is an individual's ability to take care of oneself which can be influenced by age, social development. Itself which can be influenced by age, sociocultural development, health and others.

- 3) *Theraupetic self care demand* is a demand or interest in self-care which is an independent action that is carried out in a certain time for self-care by using methods and tools in appropriate actions.
- 4) *Self care requirements* are an action aimed at providing and self-care that is universal and related to human life processes and in an effort to maintain bodily functions.

b. *Self Care Deficit*

Self care deficit is an important part of nursing in general where all care planning is provided when nurses are needed. Nursing is needed by a person when they are unable or limited to do *self care deficit*, can be expected in immature children, or needs that exceed ability and there is an estimated decrease in ability in care and demands in increasing self-care , both quality and quantity. In fulfilling one's own nursing or doing for others. As a mentor to others, provide support, improve the development of the environment for personal development and teach or educate others.

2. *Self-Care Management Factor*

According to Lawrence Green's (1980) theory, human behavior is influenced by 3 main factors, including predisposing factors that include knowledge and attitudes, enabling factors that are characteristics of an environment and reinforcing or driving factors that are manifested in behavior and attitudes (Alfiah, 2021).

Behavior Self-Care Management There are 4 factors, namely knowledge, motivation, family support and self-efficacy. Sufferers who have *Self-Care Management* good if you have a positive attitude, get positive support from family and people around you, have a great and strong motivation to heal and have *Self-efficacy* or good self-efficacy (MUBINA, 2025). In this study, according to the theory of Lawrence Green (1980), the factors that affect *Self-Care Management* :

a. Predisposing Factors

This factor includes knowledge, motivation and belief or *self efficacy*. The following is an explanation of knowledge, motivation and belief or *self efficacy*:

1) Knowledge

Knowledge is important because this problem is included in diseases that cannot be cured but can be controlled properly. Knowledge is an important factor that can affect behavior because behavior is based on knowledge, awareness and positive attitudes. So that behavior is obtained in behavior that lasts a long time (Elfina Yulidar et al., 2023). In this case, knowledge of DM sufferers about their disease and matters related to treatment and prevention is important for determining the patient's independent behavior. The level of knowledge can reduce mortality and morbidity rates so that it can improve the quality of life of DM patients. Knowledge is included in the dominant factor that can determine the compliance of DM patients, the higher the knowledge, the more compliant the patient so that his diabetes problems can be controlled (Fadli & Uly, 2023).

2) Motivation

Motivation is an impulse that comes from within ourselves or outside of ourselves to perform a certain task in order to achieve a goal. Motivation is important because it can motivate individuals to do something in order to achieve goals. Self-motivation to always live a healthy and healthy life and improve self-care and reduce the risk of DM complications. Patients must have good and complete knowledge, be motivated and have effective self-efficacy. If the patient is not motivated, then to manage a diet, take medication and live a healthy lifestyle, DM sufferers will not know how to manage a healthy lifestyle (Nashrullah et al., 2021).

b. *Self Efficacy*

1). *Definition of Self efficacy*

According to Hidayanti, (2023) It is defined as an individual's belief about the ability to organize and perform certain tasks needed to get results according to what is expected. Self-efficacy also has a great influence on individual behavior. *Self efficacy* is the result of cognitive processes such as beliefs, decisions or appreciation about the extent to which the individual estimates his or her ability to perform a certain task or action to achieve the desired outcome. Self-confidence is formed and developed through 4 main processes, namely cognitive, motivational, affective, and selection (Khotimah & Silvitasari, 2024).

2). *Aspects*

An individual's success in solving a problem or task can increase the individual's self-efficacy. This can be seen through the aspect of self-efficacy because self-efficacy in individuals is different from one another and can be seen through aspects that have important implications for individual behavior. Bandura classifies these aspects into 3 types of aspects, namely (Bandura, 1997):

a). *Magnitude*

This aspect has to do with the degree of difficulty, how far the individual can go with a given task type with a light or simple task type to a heavy or difficult task.

b). *Generality*

This aspect looks at how confident the individual is in the ability to complete tasks with a variety of situations. Starting from doing an activity or task in a variety of situations.

c). *Strength*

This aspect looks at how far or strong an individual's belief in his or her abilities is. If they have high self-efficacy, the individual has an optimistic attitude, a positive mood, is able to improve the ability to process information more efficiently, and has positive

thoughts such as seeing failure as a motivation to do better. If they have low self-efficacy, the individual has a pessimistic attitude, negative mood, it is possible that the individual can have anger, guilt and can magnify the problems experienced.

c. Enabling Factors

It is an element that functions to facilitate or enable a person to carry out health behaviors. These factors include the availability of resources, facilities, skills, and access to health services that support these behaviors. In this case, the ability of diabetic patients to self-care management is greatly influenced by the ease of access to health care facilities, the availability of blood sugar level monitoring equipment, medicines, and educational support from health workers. In addition, socioeconomic conditions are also included in the possible factors, because financial ability determines the extent to which patients can obtain the means and infrastructure needed in managing their disease (Hijrah & Asrina, 2024).

d. Reinforcing Factors

Playing a role in maintaining and strengthening established health behaviors. This factor includes social support and positive feedback from the surrounding environment, both from families, health workers, and peer groups. Consistent family support in helping patients maintain a diet, adhere to treatment schedules, and perform regular health checks can improve the success of self-management. In addition, health workers have an important role in providing motivation, counseling, and strengthening positive behavior through effective communication. Support from the diabetic patient community or peer group can also be a significant reinforcement through sharing experiences and encouraging each other to maintain healthy behaviors (Syaipuddin et al., 2025).

3. Self-Care Management Measurement

Measuring *self-care* management behavior in people with DM is the *Diabetes Self Management Questionnaire* (DSMQ). This questionnaire was

developed by Schmitt et al., (2022), and has been shown to be effective in assessing various aspects of self-management behaviors performed by individuals with diabetes. The DSMQ is a self-report questionnaire consisting of 16–20 items. Patient responses are given on a Likert scale (e.g. 0–3 or 3–0), with behavioral frequency categories (highly appropriate, appropriate, nearly appropriate, non-appropriate). The score results showed 0–24 = very poor self-management, 25–48 = very good self-management. In the assessment process, the DSMQ assessment in this study directly uses a raw *score*, which is by adding up all item scores after *reverse scoring* on negative items. The total score range is at 0–48. The higher the score obtained, the better the *self-care management* behavior of diabetic patients.

D. Sleep *Quality Concept*

1. Definition of *Sleep Quality*

Sleep *quality* is the ability to meet the needs of sleep in meeting the maximum number of sleep cycles *Rapid Eye Moves* (REM) and *Non-Rapid Eye Movement* (NREM). Sleep quality can also be interpreted as a parameter of a person's sleep satisfaction which is assessed from quantitative and qualitative aspects, such as the time needed to fall asleep, length of sleep, frequency of awakening, dizziness, and depth of sleep. Poor sleep quality has adverse impacts, such as difficulty focusing on making decisions, being easily tired, being overly sensitive and irritable, and can increase the risk of heart disorders and diabetes (Hidayat, 2020).

2. Sleep *Quality Factor*

Influencing factors *Sleep Quality* According to Harahap et al., (2022) These qualities can indicate the individual's ability to sleep and get the amount of rest according to his needs. Factors that can affect it are as follows:

a. Diseases

Many diseases increase the need for sleep, for example diseases caused by infections.

b. Exercise and fatigue

Fatigue due to high activity can require more sleep to maintain the balance of energy that has been released.

c. Psychological stress

Psychological conditions can occur in a person due to mental tension, where a person experiences anxiety.

d. Medication

Some types of drugs that can affect the sleep process are types of diuretic drugs that cause a person insomnia, antidepressants can suppress REM.

e. Nutrition

High protein can speed up the sleep process.

f. Environment

A safe and comfortable environment for a person can speed up the sleep process.

g. Motivation is a person's urge or desire to sleep.

3. Sleep *Quality Measurement*

Pittsburgh Sleep Quality Index (PSQI) is the most widely used questionnaire in research and clinical practice to assess sleep quality (Domingo et al., 2021). In PSQI, there are seven components of the assessment which include subjective sleep quality, sleep latency, sleep duration, sleep efficiency, sleep disorders, drug use, and daytime dysfunction. The score descriptions are 0 very good, 1 quite good, 2 somewhat bad, and 3 very bad. To determine the final score that concludes the overall quality of sleep is to sum all the score results from components 1 to 7, with the results being good if 0-28 and bad if 29-57. PSQI produced a sensitivity of 75.82% and a specificity of 76.99% to classify sleep quality. PSQI is said to be the most frequently used sleep quality measurement questionnaire, due to its good reliability and validity (Domingo et al., 2021).

E. The Relationship of *Self-Care Management* with the Quality of Life of Patients with Diabetes Mellitus

According to the results of several researchers on *Self-Care Management* with the quality of life of DM patients including Simanullang et al., (2022) at Santa Elisabeth Hospital Medan in 2023 with a total of 53 respondents indicating that there is a relationship *Self-Care Management* on quality of life in type 2 DM patients ($p = 0.001$). Meanwhile, according to the results of the study Asnaniar, (2019) at the Antang Health Center with a sample of 38 people, showing that there is a meaningful relationship between *Self-Care Management* with quality of life in patients with type 2 diabetes ($p = 0.001$). And according to the results of the study Siregar et al., (2022) at the Imelda Workers Indonesia Hospital in Medan in 2021 which was carried out with 30 respondents stating *Self Care* related to the quality of life of DM patients, the results were obtained with a value of ($p = 0.001$). Then according to the results of the study Luther et al., (2023) in the working area of the Tamalanrea Jaya Makassar Health Center with 82 respondents showing that the relationship between the *Self Care* with *quality of life* patients with type II diabetes with a score of ($p=0.003$).

F. Relationship between *Sleep Quality* and Quality of Life of Diabetes Mellitus Patients

The results of the research of several researchers regarding *sleep quality* with the quality of life of DM patients, including, Solang et al., (2025) At the Kabila Health Center, of the 96 respondents studied, most of the respondents had poor sleep quality ($p = 0.001$). Then according to research Peter and Penzel, (2020) in Sanang Barigas Palangka Raya, with 80 respondents, there was a significant correlation between sleep quality and quality of life ($P=0.001$). According to the results of the study Sanjaya et al, (2025) At the Pasundan Health Center in 58 respondents, the test results assessed a significant and meaningful correlation between sleep quality and quality of life of people with type 2 DM ($p=0.022$). Other research by Trifa and Purwanti (2024) in the working area of the Bendosari Sukoharjo Health Center with 63 respondents,

it was also shown that there was a significant relationship between diabetic neuropathy and sleep quality in DM patients ($p=0.001$).



G. Theoretical Framework

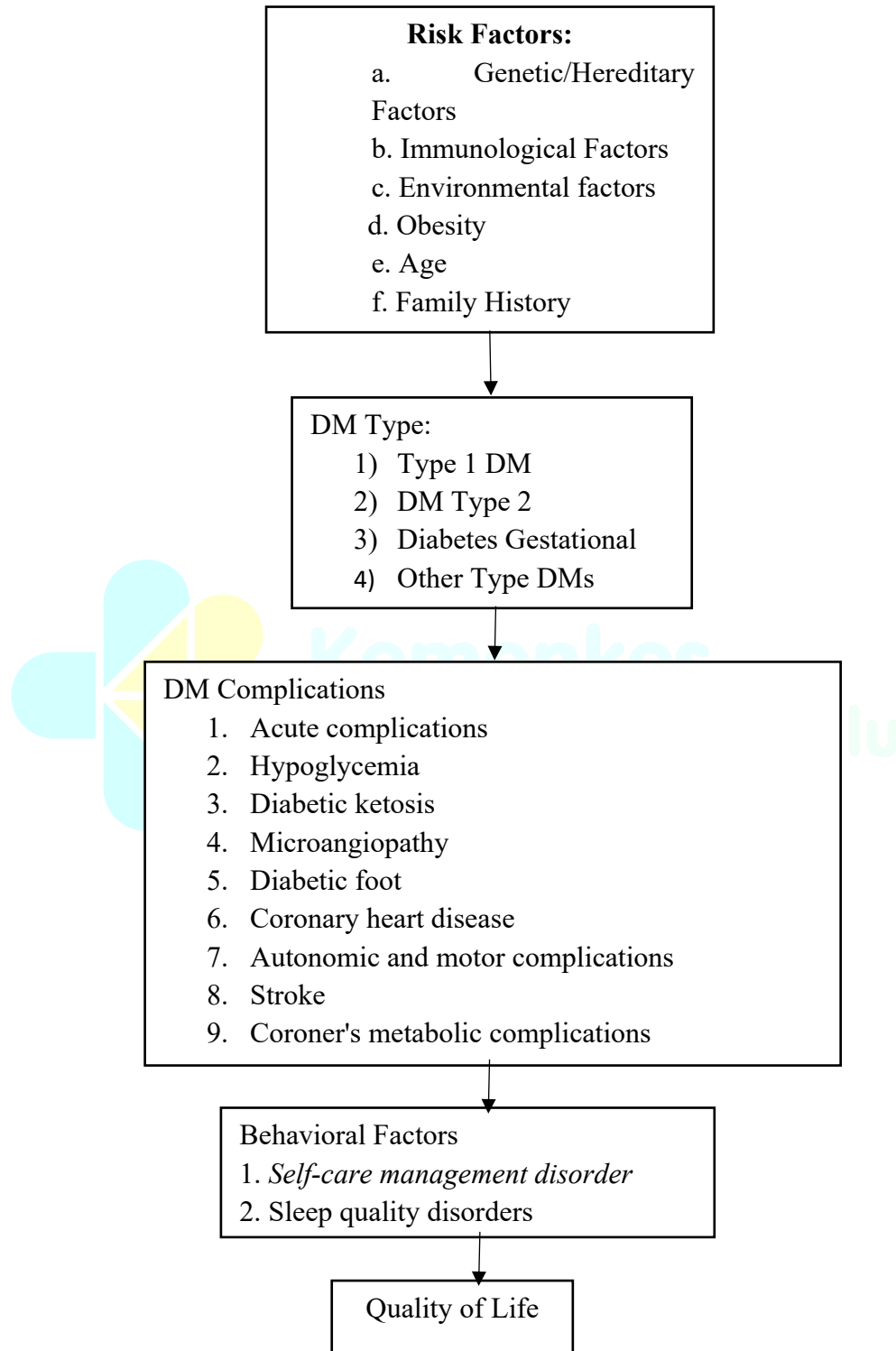


Chart 2. 1 Theoretical Framework

Sources: (Mato et al., 2023), (Nistiandani et al., 2023), (Baidhawi et al., 2024)