

THE RELATIONSHIP BETWEEN SMOKING BEHAVIOR AND THE FULFILLMENT OF NUTRITIONAL NEEDS IN THE COMMUNITY BASED ON THE HEALTH BELIEF MODEL THEORY ON BLOOD SUGAR LEVELS IN PATIENTS WITH DIABETES MELLITUS

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ABSTRACT

Diabetes is one of the non-communicable diseases that must be addressed. Diabetes Mellitus (DM) is a metabolic disease characterized by high blood sugar levels. Diabetes mellitus (DM) is a significant public health concern affecting the quality of life. Diabetes is a metabolic disorder characterized by insufficient insulin production, defects in insulin secretion, or both, associated with excess mortality, morbidity, vascular complications, terrible general health issues, and decreased quality of life. This research was conducted in Geulumpang Payong Village, Jeumpa District, Bireuen Regency. With the number of populations suffering from DM being 54 people, the sampling technique used was Total Sampling technique with a total of 54 respondents. The study aimed to investigate the relationship between smoking behavior and meeting nutritional needs in the community based on the Health Belief Model theory, with a focus on blood sugar levels in patients with diabetes mellitus. This study was conducted between January and April 2023, using analytical methods with a Cross-Sectional approach. The data analysis in this study involved univariate and bivariate analysis, which revealed that the majority of seniors were 25 people (46.3%) in terms of age. To summarize, there is a significant correlation between meeting nutritional requirements and blood sugar levels in patients with diabetes, with a confidence level of 95% (α 0.05). The p-value or Asymp. Sig. (2-sided) is 0.000, indicating that the P value of 0.000 is less than or equal to 0.05. It is recommended that individuals adopt a healthier lifestyle to maintain good health.

Keywords: Smoking, HBM Nutrition, Diabetes Mellitus

1. Introduction

Diabetes is one of the non-communicable diseases that must be addressed. Diabetes Mellitus (DM) is a metabolic disease characterized by high blood sugar levels. Diabetes Mellitus (DM) is a group of metabolic diseases with characteristics of hyperglycemia that occur due to abnormalities in insulin secretion, insulin action, or both.

According to the International Diabetes Federation (IDF) report, the number of people with type 1 diabetes in Indonesia will reach 41,817 by 2022. This number puts Indonesia at the top of ASEAN (IDF, 2023). According to the American Diabetes Association (ADA) 2019, every 21 seconds there is one person is diagnosed with diabetes mellitus, or almost half of the adult population in America. Based on data from the International Diabetes Federation

(IDF) Organization in the 10th edition of the Atlas 2021, the number of people with diabetes continues to increase in Indonesia. In 2019, there 10.7 million people to 19.5 million people in 2021. In addition, 537 million adults (20-79 years), or 1 in 10 people, are estimated to be living with diabetes, either type 1 diabetes or type 2 diabetes. This figure is predicted to increase to 643 million in 2030 and 784 million in 2045.

Indonesia ranked 7th out of 10 countries in the world with 10.7 million people with diabetes in 2019, which is expected to increase in 2030 and 2045 to 13.7 million and 16.6 million (Pangribowo, 2020). The high incidence of Diabetes Mellitus (DM) in Indonesia will make various aspects of DM management frequent and risky problems (PERKENI, 2015).

Factors that greatly impact the management of adherence and nutritional management in DM patients. The impact of not adhering to the three principles of the right schedule, right type, and right amount of food makes the quality of life of DM clients less good (Sutedjo, 2010).

The Health Belief Model is a theory developed by Becker (1974) from Lewin's (1954) field theory (Notoadmodjo, 2010). The Health Belief Model theory is one of the first models designed to encourage people to take action towards positive health. The concept of the Health Belief Model theory is that healthy behavior is determined by individual beliefs or perceptions about disease and the means available to avoid the occurrence of a disease (Hall, 2012).

Risk factors for DM can be divided into two, the first is unchangeable risk factors such as gender, age, and genetic factors. The second is modifiable risk factors such as smoking, physical activity, alcohol consumption, stress factors, and excessive coffee and caffeine consumption (Bustan, 2010).

The Centers for Disease Control and Prevention (CDC, 2014) states that smoking can cause oxidative stress, which can increase the risk of developing DM. Oxidative stress occurs when chemicals produced from cigarette smoke combine with oxygen in the body, increasing oxidative stress (free radicals). This can also cause cell damage and lead to inflammation.

Smoking can also increase the risk of abdominal obesity (belly fat) and can increase the production of cortisol, a hormone that increases blood sugar levels, nicotinic acetylcholine receptors, and can affect insulin secretion (X, Xie et al., 2009). For people with type II DM, smoking can make it more difficult to control blood sugar levels (CDC, 2014).

Data from Aceh Province continues to increase dramatically. In 2020, it reached 121,160 people with an estimated 11.3% suffering from diabetes mellitus in 2030, while only 62% of patients with type-2 diabetes mellitus receive standardized care. Banda Aceh is one of

the regions with the 5th highest number of type-2 diabetes mellitus patients compared to other Aceh regions (Aceh Health Office, 2020).

Based on the initial survey conducted, there were 54 males with Diabetes Mellitus with male gender. Patients who are male have a history of active smokers. They consume an average of more than 10 cigarettes per day.

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Based on the above background, the researcher is interested in Researching The Relation Between Smoking Behaviour And The Fulfilment Of Nutritional Needs In The Community Based On The Health Belief Model Theory On Blood Sugar Levels In Patients With Diabetes Mellitus.

2. Literature Review and Hypothesis

Diabetes mellitus (DM) is a metabolic disorder that is usually characterized by increased blood sugar levels in the body and is commonly referred to as hyperglycemia. This condition is usually caused by decreased insulin production due to disruption of beta cell function in the pancreas, resulting in reduced insulin response in the body (ADA, 2018).

DM is often referred to as the silent killer disease because symptoms such as easy hunger, easy thirst, and frequent urination are realized when the patient begins to feel complaints (Isnaini and Ratnasari, 2018). Diabetes mellitus (DM) is widely known as a disease that is closely related to food intake. Food intake such as carbohydrates or sugar, protein, fat, and excessive energy can be an early risk factor for DM. The more excessive the food intake, the more likely it will cause DM (Susanti and Bistara, 2018). Diabetes Mellitus is a set of symptoms of metabolic disorders characterized by above-standard blood sugar levels that affect the metabolism of carbohydrate, fat, and protein nutrients with a multi-factor etiology (Nurayati and Adriani, 2017).

According to Jilao, M (2017), the blood sugar test has the following criteria: Good: 80-139 mg/dl, Moderate: 140-179 mg/dl, Bad: ≥ 180 mg/dl. Classification of Diabetes Mellitus According to the American Diabetes Association (ADA) in 2020, DM can be classified into several types, including type 1 DM, type 2 DM, gestational DM, and other types of DM.

Smoking is one of the main causes of coronary heart disease. Smoking increases a

person's risk of developing coronary heart disease. The risk can increase up to 6 times compared to non-smokers. Additionally, a smoker has a 10-year risk of developing coronary heart disease faster than a normal person. Smoking can increase heart rate and blood pressure. This is influenced by nicotine in the blood circulation (Situmorang, 2015).

Modifiable risk factors are hypertension, smoking, diabetes mellitus, dyslipidaemia (abnormal fat metabolism), obesity, physical inactivity, poor diet, and stress (Kemenkes RI, 2019). Age is one of the factors that cause coronary heart disease, with increasing age, people will be more susceptible to CHD, but rarely causing serious illness before 40 years and will increase 5 times at the age of 40-60 years. Studies suggest that one of the most significant risk factors for CHD is diabetes mellitus, particularly type 2 diabetes mellitus. Diabetes Mellitus is a disease caused by blood sugar levels equal to or greater than 200mg/dl, and fasting blood sugar levels equal to or greater than 126mg/dl. DM is also known as the silent killer because without realising it, people affected by DM may experience complications (Petersmann et al, 2018).

Cigarette smoke can increase blood sugar levels. Smoking is identified as a risk factor for insulin resistance, a precursor of type 2 diabetes. Additionally, smoking can worsen glucose metabolism of glucose which can trigger type 2 diabetes. Diabetes is known as a silent killer and is often unnoticed, undiagnosed, and lacking preventive measures, making that can unwittingly develop progressively. Prevention and control of diabetes mellitus in Indonesia are carried out to keep individuals healthy, people who already have risk factors can control risk factors so as not to fall ill with diabetes, and people who already have diabetes mellitus can control their disease so that complications or premature death do not occur (Sembiring, 2021).

The classification of smokers according to WHO (2019), is divided into four categories: Light smokers (1 - 10 cigarettes), Moderate smokers (11 - 20 cigarettes), Heavy smokers (21 - 30 cigarettes), and Very heavy smokers (more than 31 cigarettes).

Nutritional status is a condition determined by the level of the body's need for calories and other nutrients obtained from food intake with measurable physical effects (Kamah, 2020). Nutritional status is a factor that exists within the individual. Direct influencing factors are the amount and type of food intake and infectious conditions. Nutritional status is also defined as the physical condition of a person or group of people determined by one or a combination of certain nutritional measures (Supariasa, I. D., et al., 2016).

Lifestyle is a major factor in the increasing prevalence of non-communicable diseases, one of which is DM (RISKESDAS, 2019). Diabetes mellitus is a disease that requires good

self-management. Noncompliance in diet and eating patterns will result in instability of glucose levels in the blood (Setyoadi, Kristianto & Afifah, 2018).

One of the problems experienced by type II DM patients is nutritional imbalance or nutritional deficit. Nutritional imbalance is a condition when the fulfillment of nutrients is not appropriate or does not meet the metabolic needs required by the body (PPNI, 2017).

The causes of this nutritional deficit problem include the patient's inability to swallow and digest food, as well as economic factors that affect, for example, insufficient finance. There are four main pillars in DM management, namely menu planning, physical exercise, hypoglycemic drugs, and counseling. Menu planning will help people with DM improve eating habits so that they can control glucose, fat, and blood pressure levels (Nardina et al., 2021).

Diet is a determinant of obesity, which indirectly causes diabetes mellitus. An unbalanced diet can have a negative impact on health and nutrition. Food consumption patterns that can lead to diabetes mellitus, namely food consumption patterns that contain excessive amounts of calories, high saturated fat and sugar, low fiber and low micronutrients, will cause obesity, overnutrition, and increase free radicals which ultimately result in changes in disease patterns, from infections to chronic non-infectious diseases or trigger the emergence of degenerative diseases (Timah, 2019).

Energy needs can be determined by calculating the basal metabolic needs of 25-35 kcal per kg of normal body weight plus physical activity and special circumstances. Factors that determine calorie needs are gender, age, physical activity, body weight, and special conditions. Recommended fiber consumption is 20-35 grams/day, sodium intake for people with DM is the same as healthy people, protein intake is 0.8 g/kg BW per day or 10% of energy needs, cholesterol consumption is recommended at 200 g/day, total carbohydrate restriction <130g/day (Hariawan, 2019).

The basic concept of the Health Belief Model (HBM) is a health behavior change model developed to explain and predict health-related behavior, particularly in terms of health service use (Nikitara et al., 2019).

One of the methods used in health education and health promotion is the Health Belief Model (HBM). The Health Belief Model-based health promotion approach is to strengthen beliefs in the community in preventing Diabetes Mellitus. It is hoped that Posbindu cadres will be able to conduct health counseling and early detection if there are people who experience diabetes mellitus (Bayat et al., 2013).

The health belief model is the patient's belief in the effect of recommended actions to

reduce the risk of impact and perceived barriers to recommended actions on patients and families (Bayat et al., 2013).

According to Hasbi (2012), the Health belief model is a theory that can explain the reasons for non-compliance behavior to carry out self-management in improving the quality of life in patients with Type 2 Diabetes Mellitus. Diabetes mellitus self-management carried out throughout life is related to perceptions of barriers, perceived benefits, vulnerability, and severity of Type 2 diabetes mellitus. Increasing the incidence of Type 2 Diabetes Mellitus requires effective care in the short and long term carried out by nurses whose role is to provide knowledge, health education, skills, support, and motivation to care for patients with diabetes mellitus comprehensively by involving families and communities (Nikitara et al., 2019).

The hypothesis in this study is to determine whether there is a relationship between Behaviour And The Fulfilment Of Nutritional Needs In The Community Based On The Health Belief Model Theory On Blood Sugar Levels In Patients With Diabetes Mellitus.

3. Research and Method

This research method uses an analytical with a Cross Sectional approach, to investigate the relationship between smoking behavior and meeting nutritional needs in the community, based on the Health Belief Model theory of blood sugar levels in patients with diabetes mellitus. The population in this study were respondents who were male, had diabetes who were active smokers. The sample method used was a total of 54 people.

This data analysis utilized univariate analysis, which aimed to explain or describe the characteristics of each research variable. Bivariate analysis was conducted to determine the relationship between each dependent variable using the Chi Square test.

4. Results and Discussion

The results of the Chi-square test of the relationship between smoking and blood sugar levels of people with DM in Blang Batee Village, Peureulak District, East Aceh Regency, with a 95% confidence level (α 0.05), it is known that the p value or Asymp. Sig. (2-sided) was 0.287, indicating that the P value of $0.287 \leq 0.05$, this indicates that there is no significant relationship between smoking and blood sugar levels of people with DM in Blang Batee Village, Peureulak District, East Aceh Regency.

The results of the Chi-square test of the relationship between compliance with fulfilling nutritional needs and blood sugar levels of patients with DM in Blang Batee Village, Peureulak District, East Aceh Regency, with a 95% confidence level (α 0.05), it is known that the p value or Asymp. Sig. (2-sided) was 0.000, indicating that the P value of $0.000 \leq 0.05$, this shows that there is a significant relationship between compliance with fulfilment of nutritional needs on blood sugar levels of patients with DM in Blang Batee Village, Peureulak District, East Aceh Regency.

5. Conclusion

The results of this study are in line with those revealed by the Journal of the American Medical Association. Smoking and diabetes are indeed interrelated because smoking can cause diabetes, and smoking can exacerbate a person's sugar disease. According to Kistianita and Gayatri (2015), there are several mechanisms that contribute to the relationship between smoking. Active smokers tend to be thinner than non-smokers or ex-smokers, but smokers tend to gain weight when they stop smoking, and former heavy and moderate smokers will be fatter than former light smokers. Therefore, it is necessary to start reducing daily cigarette consumption to the stage of quitting smoking through education provided by health agencies to avoid the risk of developing diabetes mellitus.

Something that is considered beneficial will stimulate individuals to take action to obtain benefits (Notoadmodjo, 2014). Therefore, they adhere to the HBM diet. According to researchers, they have felt the benefits obtained in compliance with nutritional fulfillment because it is likely that the disease they suffer will not arise or be severe by adhering to a diet.

Perceived barriers to food can also influence dietary behavior, with individuals perceiving food consumption as important for health. While many people realize that food intake decreases a healthy diet for diabetes mellitus patients (Morrow, 2016).

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