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Ability of Diabetes Mellitus Patients to Detect and First Aid for Hypoglycemia

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ABSTRACT

Hypoglycemia is an acute complication of diabetes mellitus patients that can occur repeatedly and can aggravate diabetes mellitus and even cause death. For this reason, first aid is needed to prevent death. This study aims to determine the ability to detect and first aid hypoglycemia at home in patients with type 2 diabetes mellitus. The research design used in this study is descriptive quantitative, with a purposive sampling technique with a total of 30 respondents. The inclusion criteria are patients with type 2 diabetes mellitus who undergo both oral and insulin therapy. The research instrument used by giving a hypoglycemia detection ability questionnaire sheet consists of 5 knowledge questions, 4 attitude questions, and 5 action questions, with an assessment of correct answers 1 and wrong answers 0. This study concluded that age, education, knowledge, and duration of diabetes mellitus can affect a person's detection and first aid for hypoglycemia at home. The results of this study on the ability to detect type 2 diabetes mellitus patients, can be study material and provide information for puskesmas in formulating plans such as education on signs and symptoms, handling, and prevention of hypoglycemia through prolongs and posbindu PTM activities

Keywords: Type 2 Diabetes Mellitus, Hypoglycemia, Ability

INTRODUCTION

Diabetes mellitus is a chronic disease that occurs due to high blood sugar levels in the body caused by the body being unable to produce insulin effectively(6). According to the American Diabetes Association (2022), diabetes mellitus is classified into four, namely type one diabetes mellitus, type two diabetes mellitus, gestational diabetes mellitus, and other types of diabetes mellitus(1).

A survey conducted by the International Diabetes Federation (IDFshows that Indonesia is the sixth most diabetic country in the world with 10.3 million patients and is expected to continue to grow to 16.7 million patients by 2045(5). According to Riskesdas, there will be an increase in the prevalence

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of diabetes mellitus based on blood sugar testing compared to 2013, which increased from 6.9% to 8.5%. And based on doctor's diagnoses in East Java, it increased from 2.1% in 2013 to 2.6% in 2018 (9).

Diabetes mellitus emergencies are life-threatening conditions associated with acute complications of diabetes mellitus that require immediate help. Diabetes mellitus emergencies are hyperglycemia and hypoglycemia crises(4). Hypoglycaemia is a decrease in blood glucose levels of less than 70 mg/dL(8). Hypoglycaemia is an acute complication of diabetes mellitus that can occur repeatedly and can aggravate diabetes mellitus and even cause death(12). Hypoglycemia can occur when the patient is in the clinical care unit but can occur unnoticed when the patient is treated at home(13).

The causes of hypoglycemia according to (the Ministry of Health, 2022) that often occur in patients with diabetes mellitus is the use of insulin drugs or the use of oral hypoglycaemic drugs exceeding the dose that has been given, the patient's diet is small, the patient delays eating, excessive physical activity and before without eating enough, and consuming excessive alcohol(6). Signs and symptoms of hypoglycemia are classified as mild, moderate, and severe. Mild signs and symptoms include tremors, heart palpitations, nervousness, rapid heartbeat (tachycardia), sweating, and hunger. Moderate signs and symptoms include confusion, anger, difficulty concentrating, headache, numbness of the lips and tongue, drowsiness, and blurred vision(10).

Management of hypoglycemia can be done by detecting it. Detection of hypoglycemia is a form of behavior that must be done in managing diabetes, especially in maintaining blood sugar balance(13). In ordinary people, the understanding of the detection of hypoglycemia is only a weak body. At the same time, the signs and symptoms of hypoglycemia are not just weakness.

Based on the researcher's interview with 10 patients with diabetes mellitus who visited the Emergency Department, data obtained from 7 out of 10 patients who had experienced hypoglycemia, and 2 out of 10 patients did not know about hypoglycemia and how to detect it. Because of the above description, researchers need further study on the Ability to Detect and First Aid Hypoglycaemia at Home in Type 2 Diabetes Mellitus Patients in the working area of Puskesmas Sananwetan Blitar City.

METHODS

The research design used in this study was descriptive quantitative. The population of this study was 297 patients with type 2 diabetes mellitus who had been recorded at the Blitar City Sananwetan Health Center. The sample in this study were 30 patients with type 2 diabetes mellitus at the Blitar City Sananwetan Health Centre who met the inclusion criteria, namely patients with type 2 diabetes mellitus, undergoing oral or insulin therapy, compositional level of consciousness, and aged> 20 years, which were taken using non-probability sampling technique, namely purposive sampling. The place and time of the study at the Sanawetan Community Health Centre in Blitar City on 3 April 2024 - 20 April 2024. The variable in this study was the ability to detect first-aid hypoglycemia at home in patients with type 2 diabetes mellitus in the working area of Puskesmas Sananwetan Blitar City. The data collection

process of this study used the Knowledge Attitude Practice (KAP) questionnaire developed by Sunaryo (2008) consisting of 14 items, and has been tested for validity and reliability with the results of 3 invalid questions but improved the structure and the Cronbach's alpha r value of 0.778 (r alpha> 0.361). The data analysis technique used is univariate analysis.

RESULT

Table 1 Characteristics of patients with Diabetes Mellitus type 2 in the Sananwetan Health Centre Working Area

No	Variable		f	%
1	Age	30-39 years	2	7
		40-49 years	4	13
		50-59 years	7	23
		>60 years	17	57
2	Gender	Male	14	47
		Female	16	53
3	Education	Primary School	2	7
		Junior High School	7	23
		Senior High School	17	57
		University	4	13
4	Employment	Not Employment	4	13
		civil servant	3	10
		Wiraswasta	5	17
		Retired	2	7
		Housewife	16	53
5	Duration of Diabetes	< 5 years	15	50
		5-10 years	9	30
		>10 years	6	20
6	History of Hypoglycaemia	Ever	13	43
		Never	17	57
7	Availability of Blood Sugar Meter	Yes	10	33
		No	20	67
8	Type of Treatment Undergone	Oral	23	77
		Insulin	4	13
		Oral & insulin	3	10
9	Disease History	hypertension	11	37
		stroke	1	3
		not present	18	60

Based on the table above, it was found that patients with type 2 diabetes mellitus were dominated by the age group >60 with a percentage of more than half 57% (17 people). The majority of respondents are female with a percentage of more than half 53% (16 people). The majority of the last education taken by respondents is high school with a percentage of more than half 57% (17 people). IRT dominates the work done by respondents more than half, 53% (16 people), the length of time respondents suffer from diabetes mellitus <5 years half, 50% (15 people), the majority of respondents have never experienced hypoglycemia than half, 57% (17 people), there is no availability of blood sugar measuring devices more than half, 67% (20 people), most of the treatment taken by respondents is oral 77% (23 people), more than half, respondents have no history of other diseases 60% (18 people).

Table 2 Data on the Ability to Detect and First Aid Hypoglycaemia at Home in Patients with Type 2 Diabetes Mellitus According to Assessment Parameters

No	Variable		Answer			
			True		False	
			f	%	f	%
1	Knowledge	1. A drop in blood sugar below normal may occur in patients with diabetes.	30	100	0	0
		2. Excessive use of diabetes medication or insulin may lower blood sugar below normal.	30	100	0	0
		3. Heart palpitations, profuse sweating, dizziness, and trembling are signs of falling blood sugar	28	93	2	7
		4. Drinking alcohol causes low blood sugar	16	53	14	47
		5. Not eating can cause low blood sugar	19	63	11	37
2	Attitude	1. If you suddenly feel very hungry even though you just ate 2 hours ago, palpitations, sweating profusely, and trembling, you should be aware of low blood sugar.	18	60	12	40
		2. I consider that a drop in blood sugar after taking diabetes medication is normal and is not a problem to be afraid of	28	93	2	7
		3. If I experience low blood sugar, I believe it will heal itself without me having to take any action.	19	63	11	37
		4. I consider it very important to maintain a normal blood sugar balance	30	100	0	0
3	Practice	1. Checking blood sugar can be done at home	30	100	0	0
		2. Drinking sugar solutions, and eating sweet foods are measures to treat low blood sugar	30	100	0	0
		3. Severe low blood sugar can be prevented by checking blood sugar regularly	21	70	9	30
		4. If symptoms of low blood sugar do not improve after drinking sugar solution, go to a doctor or hospital immediately.	28	93	2	7
		5. I always take my diabetes medication as directed by my doctor	28	93	2	7

Based on Table 2, it is known that according to the assessment parameters, the most wrong answer is drinking alcohol causes low blood sugar, which is less than half, 47% (n = 14), the second most wrong answer is if you suddenly feel very hungry even though you just ate 2 hours ago, palpitations, profuse sweating and shaking The second most incorrect answer was if I suddenly feel very hungry even though I just ate 2 hours ago, pounding, sweating a lot and shaking, then I should be aware of the occurrence of low blood sugar, which is less than half, 40% (n=12), in addition, the most incorrect answer was not eating can cause low blood sugar, which is less than half, 37% (n=11), and if I experience low blood sugar, I believe it will heal itself without me having to take any action, which is less than half, 37% (n=11). There were 5 questions 30 respondents answered correctly 100%, namely on the question of a decrease in blood sugar below normal can occur in diabetes patients if taking diabetes medication or excessive insulin can reduce blood sugar below normal, I consider it very important to maintain a normal blood sugar balance, blood sugar checks can be done by yourself at home, and drinking sugar solutions, eating sweet foods are actions to overcome low blood sugar. Some respondents were able to detect first-aid hypoglycemia according to the assessment parameters.

Table 2 Ability to Detect and First Aid Hypoglycaemia at Home in the Sananwetan Health Centre Working Area (n=30)

Variable	f	%
Very High	11	37
High	7	23
Medium	12	40

Table 4.3 shows that the ability to detect first-aid hypoglycemia at home is less than half 40% (12 people) is moderate.

DISCUSSION

Moderate Ability

Based on the results of the research that has been carried out, the results obtained are less than half, 40% (12 people) are in the moderate ability category. Evidenced by the respondent getting a score of 71-79% based on the results of the research that has been done, which means that the respondent can answer 10-11 questions correctly.

Ability is a person's ability to take action. Ability is a current assessment of what a person can do. The ability to detect is influenced by several factors, namely, age, gender, education level, knowledge, length of diabetes mellitus, and availability of blood sugar equipment. Based on research conducted by Chrisanto, Ayubbana, & Anjani on factors related to the ability of patients with diabetes mellitus to detect episodes, several factors were found to be associated with ability including education, length of diabetes mellitus, gender, and knowledge. In addition to factors that have this relationship,

Chrisanto, Ayubbana, & Anjani also conducted research related to age, as well as the availability of glucometers(3).

The factor affecting moderate-ability respondents in this study was age. The results of the research of respondents with moderate ability, aged> 60 years with a percentage of 26.67% (n = 8). Age is one of the risk factors that determine the severity and prognosis of diabetes mellitus in the elderly, and is closely related to the decline in the body's physiological functions, the use of various drugs, and increased hospital admissions(3) . The results of this study are also supported by research Bakar et al., which explains that younger age shows a faster response to signs and symptoms of hypoglycemia, while older age responds slowly due to decreased body function. As people age, they are more likely to complain about their health conditions due to decreased body function. The younger the patient's age, the more his ability to manage hypoglycemia increases(11).

Knowledge factors also affect respondents with moderate ability. Evidenced by those who answered correctly 4 questions a small portion, 17% (n = 5), and those who answered correctly 3 questions a small portion, 23% (n = 7). According to Chrisanto, Ayubbana, & Anjani (2020), Knowledge is a factor that influences a person's behavior towards an object(3). Therefore, the ability to detect hypoglycemia is also included in the knowledge category because the process of forming behavior is divided into three domains, namely cognitive, affective, and psychomotor. In this case, knowledge is categorized into the cognitive domain related to the formation of one's actions. Human behavior is strongly influenced by knowledge factors, and knowledge itself is influenced by two factors, namely internal factors such as education, occupation, and age, and external factors such as environmental and socio-cultural factors.

Very High Ability

Based on the results of this study, it is known that the ability of the majority of patients with type 2 diabetes mellitus in the Sananwetan Puskesmas work area is in a very high category, less than half, 37% (11 people) with a score of 90-100% which means they can answer 13-14 questions about the ability to detect hypoglycemia correctly. The question that most respondents with very high ability answered incorrectly was question number 4. While as many as 3 out of 11 people could answer the question correctly.

The factor that affects respondents with very high ability is education. The results of research on respondents with very high ability, the last level of education is college and high school with a percentage of 13.33% (n = 4). The level of education is one of the factors that influence the utilization of health services because educational status will affect awareness and knowledge of health (11). According to Nurhayati & Sari, a person's education level is very necessary in supporting the nursing assessment process. The level of education is closely related to a person's level of knowledge, someone who is highly educated is easier to receive information, and the level of education also reflects the level

of a person's ability to understand and receive information (7). Therefore, the education level factor has a significant influence on hypoglycemia in patients with type 2 diabetes mellitus, because respondents with a high level of education are better able to handle hypoglycemia well compared to low-level education.

In addition to educational factors, knowledge factors also affect respondents' very high ability to detect and first aid hypoglycemia. Evidenced by those who answered the questions correctly all a small portion, 17% (n = 5), and those who answered with 4 questions a small portion, 20% (n = 6). According to Sulastri & Handayani , knowledge of hypoglycemia is the most important factor associated with the ability to detect episodes of hypoglycemia (12). Knowledge is one of the variables that significantly affects metabolic control and knowledge is fundamental to preventing or reducing the occurrence of both acute and chronic complications of diabetes mellitus. According to behavioral theory, knowledge is one of the basic elements that shape human behavior.

High Aability

Based on the results of the research that has been carried out, it is found that a small portion, 23% (7 people) are in the high-ability category. Evidenced by the respondent getting a score of 86% based on the results that have been done, which means the respondent can answer 12 questions correctly.

The factor that influences respondents' high ability is the length of time suffering from diabetes mellitus. The results of research on respondents with high ability are long suffering from diabetes mellitus 5-10 years and> 10 years with a percentage of 10% (n = 3). Respondents who have had diabetes mellitus for a long time, have experienced hypoglycemia episodes more often so the stimulus for action/ability to detect hypoglycemia. Meanwhile, respondents who were newly diagnosed with diabetes mellitus had a higher risk of not monitoring their blood sugar regularly(7). According to the theory of pain behavior mechanics, it explains that a person who often experiences a painful condition or feels the symptoms of pain has a tendency to behave by paying attention to his symptoms and then seeking help. It can be concluded that the longer the respondents suffer from diabetes mellitus, the better the ability to detect hypoglycemia.

In addition to the length of time suffering from diabetes mellitus, knowledge factors also affect respondents' high ability to detect and first aid hypoglycemia. As evidenced by those who answered all questions correctly by a small proportion, 17% (n = 5), and those who answered with 4 questions by a small proportion, 6% (n = 2). According to Notoatmojo's Thought and Feeling theory in Nurhayati & Sari knowledge can be obtained from one's own experience and the experience of others. A person's experience in caring for themselves provides knowledge of how to do it. According to Nurhayati & Sari, someone who has had diabetes mellitus for a long time has carried out self-care as the disease progresses. With the experience that has been gained, it will add a lot of knowledge. In addition, people who have had diabetes mellitus for a long time are likely to receive more information from health workers when

dealing with their illness. In addition to technological developments, information on how to self-care and manage diabetes mellitus can be found everywhere such as, in books, television, magazines, the internet, brochures, and other sources. With that, one has more opportunities to get information about diabetes care knowledge. Not only external factors such as information sources come into play, but also individual internal factors. A person's level of knowledge depends on how well they understand the information they receive. If a person only reaches the level of "knowing" without being able to behave or act, they will not be able to change their behavior with the information and knowledge possessed(7) .

CONCONCLUSION

Based on the results of the research that has been done, the ability of patients with type 2 diabetes mellitus in the Sananwetan Puskesmas working area in detecting and first aid for hypoglycemia at home 37% of respondents have very high ability, 23% have high ability, and 40% of respondents have the moderate ability.

Moderate ability is influenced by age because the older the body function decreases, while the younger the age, the more responsive to the signs and symptoms of hypoglycemia. Very high ability is influenced by education, education affects ability, those with higher education are more ready to receive information and manage hypoglycemia more quickly. High ability is influenced by the length of diabetes mellitus, experience also affects the ability to act because experience can be a stimulus. It can be concluded that moderate ability is one of the highest ability categories because age is a factor that determines a person's ability to think and digest information.

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