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Original Article

Correlation between Lifestyle Factors and Blood Glucose Levels to Elderly at Elderly Posyandu in Pelem Village, Kediri District

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ABSTRACT

Data from the International Diabetes Federation (IDF) in 2017, the global prevalence rate was 425 million people in he world experiencing DM. Estimated in 2045, it will increase to 48% (629 million) among DM sufferers aged 20-79 years. Elderly is a process of aging with increasing age, which is characterized by decreasing the function of the body's organs. ThePurpose was to determine the correlation between lifestyle factors and blood glucose levels to elderly at Elderly Posyanduin Pelem Village, Kediri District.The research design was quantitative research with a cross-sectional approach. The research sample was elderly from Pelem Village, totaling 65 respondents. The independent variables were lifestyle factors (physical activity, frequency of carbohydrate consumption, frequency of fiber consumption, obesity and medication compliance), while the dependent variable was blood glucose level. The measuring instruments used questionnaires and GDA measurement tools. Data processing used univariate and bivariate tests with chi-square.The Results showed that most of elderly were aged 66-70 years (38.5%), male (63.1%), low education (52.3%) and not working (41.5%). Bivariate results showed correlation between lifestyle factors such as physical activity (p=0.007), frequency of carbohydrate consumption (p=0.028), frequency of fiber consumption (p=0.005), obesity (p=0.029) and medication compliance (p=0.032) and blood glucose levels to elderly. In Conclusion,there was correlation between lifestyle factors and blood glucose levels to elderly

INTRODUCTION

Diabetes is a serious chronic disease that occurs because the pancreas does not produce insulin (a hormone that regulates blood sugar or glucose), when the body cannot effectively use the insulin, it produces (Liu et al., 2022). Diabetes is an important public health problem, being one

of the four priority non-communicable diseases targeted for follow-up by world leaders, the number of cases and prevalence of diabetes has continued to increase over the last few decades (Septifani, 2020).

Factors that cause high blood sugar levels to elderly are decreased cell function (cell degeneration), consuming lots of foods containing sugar, lack of sleep, smoking, hereditary factors, and lack of physical activity, the most dominant factors influencing high blood sugar levels is a lack of physical activity (Studi et al., 2022). One of the consequences of increasing cases is changes in the structure of society towards changes in lifestyle which can trigger increasing non-communicable diseases, one of which is diabetes mellitus (Bustan, 2015). Lifestyle greatly influences a person's physical and psychological condition, changes in lifestyle and low levels of healthy living behavior can cause various health problems, unhealthy habits influence the emergence of diabetes mellitus such as an unbalanced diet with high cholesterol levels, cigarettes, alcohol, excessive sugar intake, minimal exercise and inadequate rest and stress can affect diabetes mellitus (Violline, 2021).

In elderly time, there is some decline in body function due to disruption of homeostasis. Some diseases that are often suffered by elderly are hypertension and diabetes mellitus (Kuno et al., 2021). Disruption of the blood glucose regulation system results increase blood glucose more than normal. Blood glucose increases with age. Along with the aging process, more and more elderly are at risk of developing Diabetes Mellitus. Diabetes Mellitus to elderly is generally asymptomatic, although there are symptoms, often in the form of non-specific symptoms such as weakness, lethargy, changes in behavior, decreased cognitive status or functional ability. This causes the diagnosis of diabetes to elderly to be rather late (Liu et al., 2022).

To elderly without diabetes, the recommended blood sugar level is less than 100 mg/dl before eating, 1-2 hours after eating less than 140 mg/dl. Maintaining blood sugar levels to elderly is one of the important things, especially those who are at risk of diabetes. various health problems, one of which is diabetes. Especially if someone already have this disease, maintaining normal blood sugar levels is the key to treatment. Increasing blood glucose levels are caused by disruption of blood glucose regulation homeostasis (Sanz-Cánovas et al., 2022). Disorders of blood glucose regulation to elderly include three things, namely insulin resistance, loss of first phase insulin release, and increased postprandial blood glucose levels. Among these three disorders, the most important role is insulin resistance. Insulin resistance can be caused by changes in the body fat composition of elderly in the form of increasing fat composition from 14% to 30% (less muscle mass while more fat tissue), decreasing physical activity as the result of decreasing insulin receptors, changes in diet which are more carbohydrates, and neurohormonal changes (Ghukasyan, 2020). Genetic factors greatly influence the occurrence of type 2 diabetes mellitus, if one parent suffers from diabetes mellitus then the risk is 15% and if both parents suffer from diabetes mellitus then the risk is 75% in children, if a mother suffers from diabetes mellitus the risk is 10-30 % greater than a father does, this is due to greater gene inheritance while in the mother's womb, if identical twins suffer from DM then the risk is 10%-90% (Chami & Khaled, 2022).

METHOD

The research design was quantitative research with a cross-sectional approach. The research sample was elderly in Pelem Village, totaling 65 respondents. The independent variables were lifestyle factors (physical activity, frequency of carbohydrate consumption, frequency of

fiber consumption, obesity and medication compliance), while the dependent variable was blood glucose level. The measuring instruments used questionnaires and GDA measurement tools. Data processing used univariate and bivariate tests with chi-square using the SPSS 22 program.

RESULTS

Table 1 Univariate Results of Demographic Variables

Variable	Category	n	%
Elderly Age	56-60 year-old	13	20,0
	61–65-year-old	20	30,8
	66–70-year-old	25	38,5
	71–75-year-old	7	10,8
Education	Low	34	52,3
	Moderate	18	27,7
	High	13	20,0
Work	Not Working	27	41,5
	Retire	27	41,5
	Farmer	11	16,9

Source: Primary Data, 2024

Table 1 showed the descriptive results of the demographic variables in the study. The results showed that most elderly were aged 66–70-year-old (38,5%), had low education (52.3%) and were not working (41.5%) and were retirees (41.5%).

Table 2 Bivariate results of correlation between lifestyle factors and blood glucose levels to elderly

Independent Variable	Category	Blood Glucose Level						P Value
		Abnormal		Normal		Total		
		n	%	n	%	n	%	
Physical Activity	Not recommended by WHO	18	54,5	15	45,5	33	100,0	0,007
	Recommended by WHO	7	21,9	25	78,1	32	100,0	
Frequency of Carbohydrate Consumption	often	17	51,5	16	48,5	33	100,0	0,028
	seldom	8	25,0	24	75,0	32	100,0	
Frequency of Fiber Consumption	seldom	17	56,7	13	43,3	33	100,0	0,005
	often	8	22,9	27	77,1	32	100,0	
Obesity	Obesity	15	53,6	13	46,4	33	100,0	0,029
	Not obesity	10	27,0	27	73,0	32	100,0	
Medication Compliance	Not compliance	12	57,1	9	42,9	33	100,0	0,032
	Compliance	13	29,5	31	70,5	32	100,0	

Source: Primary Data, 2024

Table 2 showed the bivariate results of correlation between lifestyle factors and blood glucose levels to elderly. Physical activity to elderly was mostly in accordance

with WHO recommendations, there were 25 respondents had normal blood glucose levels. There was a correlation between physical activity and blood glucose levels to elderly with a value of p = 0.007. Most of elderly seldom consume carbohydrates and had normal blood glucose levels, there were 24 respondents. There was a correlation between the frequency of carbohydrate consumption and blood glucose levels to elderly with a value of p = 0.028. Most elderly consume fiber frequently and had normal blood glucose levels, there were 27 respondents. There was a correlation between the frequency of fiber consumption and blood glucose levels to elderly with a value of p = 0.005. In the obesity variable, most elderly were not obese and had normal blood glucose levels, there were 27 respondents. There was a correlation between obesity and blood glucose levels to elderly with a value of p = 0.029. Most of elderly compliance to treatment and had normal blood glucose levels, there were 31 respondents. There was a correlation between medication compliance and blood glucose levels to elderly with a value of p=0.032.

DISCUSSION

1. Correlation between physical activity and blood glucose levels to elderly

Physical activity is any body movement that increases energy expenditure and energy burning. Physical activity is categorized as sufficient if someone does physical exercise or sports for 30 minutes every day or at least 3-5 days a week (Erniati, 2019). According to WHO, what is meant by physical activity is activity for at least 10 minutes without stopping by doing light, moderate and heavy physical activity. Heavy physical activity is body movement that causes a significant amount of energy expenditure (burning calories) so that breathing is much faster than usual. Moderate activity is body movement that causes a significant expenditure of energy, or in other words, movement that causes you to breathe less than usual. Light activity is body movement such as walking and doing office work such as typing (Chentli et al., 2015).

Doing exercise or physical activity can burn energy and reduce blood sugar levels. Thus, exercise can help reduce the amount of insulin the body needs, producing insulin that makes it easier to control blood sugar. In line with Sari's research, it states that there is a relationship between physical activity and the incidence of diabetes mellitus. Lack of exercise and increasingly irregular lifestyle changes trigger DM. Someone who does not exercise enough is at greater risk of developing DM compared to people who exercise regularly.

Physical activity is carried out for a minimum of 25 minutes, because the longer the activity, the better the effect on the body. Moderate physical activity is recommended at least three times a week. However, you need to know that forcing yourself to do activities can make your body tired, which is not good for your health (Finamore et al., 2021).

2. Correlation between frequency of carbohydrate consumption and blood glucose levels to elderly

For diabetes mellitus sufferers, the recommended carbohydrate is 46-65% of total energy intake, especially high fiber carbohydrates. A total carbohydrate restriction of 130 g/day is not recommended. A diet with a carbohydrate intake of more than 55-65% of the total daily energy requirements or more than 70% combined with the provision of single chain unsaturated fatty acids is a poor diet, especially for those at risk of developing diabetes mellitus. Protein intake of more than 10-15% of total calories per day is also an unhealthy pattern for those at risk of diabetes mellitus. (R et al., 2018).

In theory, diet management for DM sufferers aims to regulate the number of calories and carbohydrates consumed every day with the dietary principles of the right

amount, schedule and type. Dieting in the right amount, schedule and type is a principle in the DM diet which requires paying attention to the number of calories in the diet schedule which must be in accordance with the intervals, which are divided into 6 mealtimes, namely 3 main meals and 3 snacks. The recommended amount in the diet of DM patients based on the Diabetes Nutrition Study Group (DNSG) includes protein intake of 10-20% of energy intake or around 0.8 to 1.33 g/kg body weight in people under 65 years of age, and 15- 20% of people over the age of 65 years are in a stable weight condition.

3. Correlation between frequency of fiber consumption and blood glucose levels to elderly

For people with diabetes mellitus, it is recommended to consume fiber from nuts, fruit and vegetables as well as carbohydrate sources that are high in fiber. Seat consumption is 20-35 grams/day which comes from various food sources. Dieting behavior is an activity or action taken to pay attention to and regulate the nutritional intake needed by the body with the aim of reducing or maintaining body weight. Dietary behavior is part of an eating pattern, which includes external, emotional and restraint or restriction aspects. Dieting behavior is one of the important things that must be considered by considering the effects or complications that can occur if a diet is not compliance to. The more positive the body image and the higher the self-control, the healthier the dietary behavior of elderly with type II DM. This explains that maintaining food intake to stay healthy or maintain a stable weight requires stable behavioral, cognitive and decision control, to continue to follow eating rules, refrain from consuming foods that are prohibited in the diet rules and to regulate food and drink portions appropriately balanced (Liu et al., 2022).

4. Correlation between obesity and blood glucose levels to elderly

Obesity is an excessive increase in body fat. Obesity is caused by a positive energy balance because of an imbalance between energy intake and energy output, resulting in excess energy being stored in the form of fat tissue. Obesity is a multifactorial disease which is thought to be largely caused by interactions between genetic factors and environmental factors including physical activity, lifestyle, socio-economic and nutritional factors. (Kuno et al., 2021). The degree of obesity with BMI > 23 can cause an increase in blood glucose levels to 200mg, so there is a significant correlation between obesity and blood glucose levels (Setyawati et al., 2020).

5. Correlation between medication compliance and blood glucose levels to elderly

Medication compliance is the level of individual participation in following instructions regarding prescriptions and prohibitions correctly and is done based on personal willingness (Rismawan et al., 2023). Compliance with the community health center program is the patient's action of carrying out all recommendations, orders and prohibitions suggested by the community health center staff to help accelerate the patient's recovery process. The level of patient compliance in taking medication is one of the factors that determines the success of diabetes mellitus therapy. Non-compliance with DM treatment is currently still an important problem in the management of DM (Can et al., 2018).

CONCLUSIONS AND RECOMMENDATION

There is a correlation between lifestyle factors such as physical activity, frequency of carbohydrate consumption, frequency of fiber consumption, obesity and medication compliance and blood glucose levels to elderly. The advice recommended is for elderly to always regularly check their blood

glucose levels to anticipate the consequences of hypoglycemia and do light exercise regularly and increase physical activity.

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