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CONSUMPTION PATTERNS AND NUTRITIONAL STATUS OF ADOLESCENTS AND PARENTS WITH DIABETES MELLITUS (DM)

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ABTRACK

Teenagers more often consume foods that are high in fat and glucose than vegetable and fruit consumption. This can trigger the onset of diabetes mellitus, especially in adolescents who have Diabetes Mellitus (DM) parents. The purpose of this study was to determine the differences in consumption patterns and status between adolescents and parents of DM and not DM. This cross sectional study involved 42 adolescents as samples, consisting of 21 adolescents with DM parents and 21 adolescents who were not DM parents, randomly using simle rendom sampling technique, the differences between variables were analyzed using the Independent T-test and Mann Whitney test (α=0.05). The results showed that there were no differences in the consumption patterns of high Glycaemic Index (GI) foods (p = 0.229) and fruit and vegetables (p = 0.14) between adolescents with DM parents and non-DM parents, but adolescents with DM parents tended to consume more high GI foods than adolescents with non-DM parents. There were differences in nutritional status between adolescents with DM parents and non-DM parents (p = 0.036). The conclusion of this study is that most adolescents with DM parents are very overweight at the time of nutritional status. In adolescents, it is necessary to reduce the frequency of consumption of foods with high IG and to increase the consumption of fruit and vegetables and physical activity, especially in adolescents with DM parents.

Keywords : ***Diabetes Mellitus; Genetic Factors; Consumption Patterns***

INTRODUCTION

Changes in the lifestyle of adolescents greatly affect changes in eating behaviour patterns that cause degenerative diseases (Amrynia & Prameswari, 2022). Diabetes mellitus (DM) is one of the degerative diseases which is a group of metabolic diseases characterised by elevated blood sugar levels. The prevalence of diabetes mellitus is expected to increase in 2030 to 21.3 million people. Diabetes Mellitus sufferers in Aceh Province in 2022 were 189,464 cases while those who received services according to standards were 108,684 cases or 57.36%, in Aceh Besar district including the highest number of Diabetes Mellitus in Aceh with 65% of Diabetes Mellitus health services that are in accordance with standards, Ingin Jaya health centre working area is the second highest category of Diabetes Mellitus, this is an urgent problem that needs to be researched (Profil Dinas Kesehatan Aceh, 2022). The distribution of coverage of people with Diabetes Mellitus receiving services according to standards at the district / city level. Diabetes Mellitus patients aged 15 years and over as a secondary prevention effort in the working area of the puskesmas Ingin Jaya within one year. Includes measuring blood sugar at least once a month at health care facilities, especially at the Ingin Jaya health centre, as well as providing education on lifestyle changes and/or nutrition and making referrals if needed and pharmacological therapy.

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Diabetes mellitus used to be considered an 'old disease' because it was more common in people aged >40 years, but nowadays there has been a shift in the disease, the disease shift shows that Diabetes Mellitus does not only affect children and adolescents. Research conducted by the Paediatric Endocrinology Coordination Unit throughout Indonesia in 2012 showed the number of people with diabetes in children and adolescents based on data from the Indonesian Paediatric Association (IDAI) in 2018, there are 1220 children with type-1 diabetes mellitus in Indonesia The incidence of type-1 diabetes mellitus in children and adolescents increased about sevenfold from 3.88 to 28.19 per 100 million population in 2000 and 2010. Data from 2003-2009 showed that in the age group of 10-14 years, the proportion of females with type 1 diabetes mellitus (60%) was higher than males (28.6%). In 2017, 71% of children with type-1 diabetes mellitus were first diagnosed with diabetic ketoacidosis (DKA), an increase from 63% in 2016 and 2015. It is suspected that there are still many patients with type-1 diabetes mellitus who are not diagnosed or misdiagnosed when they first go to the hospital.

Several factors can lead to diabetes in children and adolescents, one of which is genetic, which increases the likelihood of children and adolescents with diabetic parents developing diabetes. The results of research by Kekenusa et al., (2013), in 101 people surveyed at the Disease Polyclinic of the Public Service Agency of the Prof. Dr. R.D. Kandou Central General Hospital in Manado, found that individuals who have descendants with type 2 DM have a five times greater risk than individuals who do not have a history of type 2 DM in their family. To reduce the prevalence of diabetes mellitus in adolescents, preventive measures can be taken, especially in adolescents who are vulnerable to developing diabetes mellitus in the future.

Nutritional needs during adolescence are relatively greater than other periods because adolescence is a period of growth and development. Nutritional needs during adolescence need attention because changes in lifestyle and eating habits result in nutrient intake needs (LeBoff et al., 2022).The wrong diet in adolescents can cause a number of diabetic health problems and this can be exacerbated if there are genetic factors for adolescents with Diabetes Mellitus parents. Teenagers are the main target because there are still many teenagers who have health problems, especially about teenage eating behavior (Trisnowati, 2018). Adolescents tend to be consumptive and have irregular consumption patterns because they are in the growth period so that all foods that are appetising and high in glucose are often consumed. high glucose and fat foods with frequent frequency can result in overweight conditions and can trigger the onset of Diabetes Mellitus.

Foods that have a high Glycaemic Index value are foods that are high in glucose. foods with a high Glycaemic Index can also raise blood sugar levels quickly, while foods with a low Glycaemic Index will be slower to raise blood sugar levels so that consumption of foods with a high Glycaemic Index value in frequent frequency triggers the occurrence of Diabetes Mellitus. The Glycaemic Index is found in foods that are high in carbohydrates, while foods that are high in fat and protein are less likely to raise blood sugar levels (Marx et al., 2023). Fruits, vegetables, cereals, and various tubers have food components and include indigestible polysaccharides. the presence of dietary fibre can affect blood glucose levels. In general, high dietary fibre content tends to have a low Glycemic Index value. Fibre can act as a physical inhibitor to digestion. Fibre can slow down the rate of food in the digestive tract and inhibit enzyme activity, resulting in slower digestion and lower blood glucose response.

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Adolescent consumption patterns must be considered properly, especially adolescents with Diabetes Mellitus parents. adolescents with Diabetes Mellitus parents are recommended to reduce the consumption of certain foods that have a high Glycemic Index value. Uncontrolled food consumption patterns and frequent consumption of foods with a high Glycaemic Index value can lead to a nutritional status that is more likely to consume more food and glucose, the nutritional status of very obese adolescents is at risk of diabetes mellitus, especially adolescents with parents with diabetes mellitus have a greater risk factor for diabetes mellitus due to genetic factors.

Efforts that must be made so that genetic factors do not expand are regulating food consumption patterns early on. The aim is to prevent risk factors as early as possible, nutritional status is determined by consumption patterns, what foods are consumed in daily frequencies, the purpose of this study is to analyse differences in consumption patterns and nutritional status between adolescents with parents with Diabetes Mellitus and not Diabetes Mellitus.

METHODS

This cross sectional study was conducted in the working area of the Ingin Jaya health centre in April 2024 involving 42 adolescents, a portion of the research sample selected randomly using random sampling technique, the sample in this study were all adolescents in the working area of the Ingin jaya health centre, who met the inclusion criteria, namely aged 17-19 years, adolescents who had one or both parents recorded as having Diabetes Mellitus and whose parents did not have Diabetes Mellitus or a disease that was at risk of Diabetes Mellitus.

Data collection was carried out by interview using questionnaire sheets. consumption pattern data obtained through food frequency questionnaire. Nutritional status was assessed anthropometrically with body mass index indicators. Weight was measured using a digital scale with an accuracy of 0.05 kg and height was measured using a microtoise with an accuracy of 0.1 cm. data collection was carried out by home visits. To analyse the differences in consumption patterns and nutritional status between adolescents with diabetes mellitus and non-diabetes mellitus parents, Mann Whitney statistical test and Independent T- test were conducted with $\alpha = 0.05$.

RESULTS AND DISCUSSION

The characteristics of respondents in this study include age and gender. Based on parents with diabetes mellitus and not diabetes mellitus.

Table 1. Characteristics of Respondents

No	Age of Teenagers	%	DM and non-DM parents
1	17	52,4%	DM
2	18	14,3%	DM
3	19	57,1%	Non DM

The age of 17-19 years is the age of late adolescence, in this phase aspects in adolescents continue to develop and change. These changes make adolescents experience many different lifestyles, behaviours and ways of choosing food to consume.

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Table 2. Distrubution of respondent characteristics between adolescents with Diabeters Melitus (DM) parents and not DM in the working area of the Ingin Jaya health centre.

Characteristics	Respondent Category			
	Teenagers with Parents with DM		Teenagers with Parents with no DM	
	n	%	n	%
Age				
17 years old	11	52,4	5	23,8
18 years old	3	14,3	4	19,0
19 years old	7	33,3	12	57,1
Sex				
Male	7	33,3	8	38,1
Female	14	66,7	13	61,9

Based on statistical tests, it is known that the difference between nutritional status with DM and non-DM parents, as many as 8 adolescents (38.1%) with DM parents are in very obese nutritional status, while most (61.9%) adolescents with non-DM parents are in normal nutritional status, namely 13 adolescents.

Adolescents with diabetes mellitus and non-diabetes mellitus parents are mostly female. Gender is related to the risk of developing Diabetes Mellitus. Diabetes Mellitus is mostly found in women because women have higher LDL (low-density lipoprotein) than men and the difference in physical activity between the two makes women at higher risk of developing Diabetes Mellitus (Gusti, 2014). This is in line with theory from Gibney et al., (2022)which states that only girls can pass the disease on to their offspring, although both genders are equally susceptible.

Foods with a high Glycemic Index value can raise blood sugar levels, while fibre found in fruit vegetables tends to have a low Glycemic Index value so that it can reduce blood sugar levels.

Table 3. Distribution of Daily Frequency of Consumption of High Glycemic Index Foods and fruit vegetables between adolescents with Diabetes Mellitus (DM) and non-DM parents in the Ingin Jaya Health Centre Working Area 2024

Daily Consumption	Respondent Category				P-value (α = 0,05)
	Adolescents With DM Parents		Adolescents With Non-DM Parents		
	Mean	Std Deviation	Mean	Std Deviation	
High GI Foods	3,67	1,742	3,05	1,532	0,229
Vegetable Fruit	1,95	3,5	0,71	1,271	0,14

The table above shows that adolescents with Diabetes Mellitus parents consume foods that have a High Glycaemic Index value on average 1x/day. The results showed that there was no difference in the frequency of daily consumption of high glycaemic index foods (p value = 0.229) and fruit vegetables (p value = 0.14)

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between adolescents with parents of diabetes mellitus and non-diabetes mellitus.

Based on Table 3, the average consumption of high glycaemic index foods and fruit vegetables is almost the same between adolescents with diabetes mellitus and non-diabetes mellitus parents, but the average consumption of high glycaemic index foods and fruit vegetables tends to be higher in adolescents with diabetes mellitus parents. Consumption of high Glycaemic Index foods and fruit vegetables is determined by the composition of the adolescent diet. The composition of the diet of adolescents with parents with diabetes mellitus is varied, namely staple foods, side dishes, vegetables, and fruit compared to non-diabetes mellitus parents who only consume staple foods and side dishes. Therefore, the frequency of consumption of high glycaemic index foods and fruit vegetables in adolescents with parents with diabetes mellitus is more frequent than in adolescents with parents without diabetes mellitus although it shows a significant difference. the food composition of adolescents with parents is actually towards the portion of a healthy plate because there is a variety of foods, but judging from the types of foods consumed based on food frequency, these foods are foods that have a high glycaemic index value(Simatupang & Kristina, 2023).

Table 4. Distribution of Nutritional Status between Adolescents with Diabetes Mellitus (DM) and non-Diabetes Mellitus Parents in the Working Area of Puskesmas Ingin Jaya Aceh Besar 2024

Kategori Remaja

Nutritional Status	DM history		No DM History		p- value (α = 0,05)
	n	%	n	%	
Very Thin	1	4,8	2	9,5	
Thin	5	23,8	5	23,8	
Normal	5	23,8	13	61,9	0,036
Fat	2	9,5	1	4,8	
Very Fat	8	38,	0	0,0	
Total	21	100,0	21	100,0	

Based on the table above, the distribution of nutritional status of adolescents. Anthropometrically measuring the nutritional status of adolescents using body weight and height according to age, the nutritional status of adolescents is classified into very thin, thin, normal, fat, and very fat. The distribution of nutritional status between adolescents with diabetes mellitus and non-diabetes mellitus parents. Nutritional status can be a problem because adolescents with DM parents have genetic factors that trigger the onset of Diabetes Mellitus exacerbated by excessive adolescent nutritional status. one of the risk factors for Diabetes Mellitus is obesity (Arslanian et al., 2018). Obesity is increasing in adolescence, this increase may be due to decreased physical activity and increased consumption of high-fat and high-carbohydrate foods (Stoica et al., 2021).

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From the results of this study, the tendency of adolescents with Diabetes Mellitus parents has a heavier weight than adolescents with non-Diabetes Mellitus parents. The very obese nutritional status that is more common in adolescents with Diabetes Mellitus parents can be caused by various factors, both genetic, environmental, and psychological factors, including irregular eating habits of adolescents and more consumption of sweet and fatty foods than consumption of fruits and vegetables, lack of activities that support adolescents to do physical activity more often and lack of supervision from parents related to adolescent consumption patterns.

CONCLUSIONS AND SUGGESTIONS

There are no differences in consumption patterns which include the frequency of consumption of high Glycemic Index foods and fruit vegetables between adolescents with parents of Diabetes Mellitus and non-Diabetes Mellitus, Conversely, there are differences in nutritional status between adolescents with parents of Diabetes Mellitus and non-Diabetes Mellitus, adolescents with parents are in very obese nutritional status compared to adolescents with non-Diabetes Mellitus parents who are more in normal nutritional status. This needs to be considered because nutritional status in very obese conditions can be at risk of diabetes mellitus, especially coupled with hereditary factors from adolescents with parents with diabetes mellitus.

Suggestions that can be given are that adolescents should pay attention to consumption patterns, frequency of consumption of foods with a High Glycemic Index, increase consumption of fruit vegetables, especially in adolescents with Diabetes Mellitus parents and increase activities that increase physical activity so that nutritional status remains in noral conditions and genetic factors of Diabetes Mellitus disease can be controlled. Not only adolescents should be aware of the risk factors for Diabetes Mellitus but parents should also be aware so that they can monitor the daily consumption patterns of adolescents and provide healthy and nutritious food.

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