



Consumption Pattern Improving Blood Glucose Levels of Family Planning Acceptors of Injection Depo-Medroxy Progesterone Acetate

Kadek Dwi Ariesthi[✉], Aning Pattypeilohy

Midwifery Study Program (DIII), Citra Bangsa Kupang University, Indonesia

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Abstract

The most popular injection contraception in Kupang city is injection contraception. The use of injectable birth control, especially depo-medroxy progesterone acetate (DMPA) more than 4 times, will potentially increase weight. This weight gain, if not balanced with a healthy diet, will potentially increase blood glucose levels. The purpose of this study is to determine the relationship of consumption patterns with an increase in blood glucose levels in DMPA injection acceptor family planning in Kupang city. This study uses a cross-sectional design. 200 respondents selected using a purposive sampling technique with inclusion criteria have used DMPA injection family planning for more than 1 year and gained weight. Data collection uses a questionnaire and measurement of glucose levels uses auto-check. Data are analyzed bivariate and multivariate. The results of blood glucose level measurements showed that 32 (16%) of respondents have glucose levels above normal. The results of the analysis showed that the habit of consuming fatty foods significantly affected the increase in blood sugar of DMPA injection acceptor family planning.

Introduction

Population growth rate in Indonesia continues to increase every year and this is one of the problems which must be solved by the government. Uncontrolled population growth can jeopardize the progress and welfare of society and the country. Pressure on population problems continues to increase which causes many countries (governments) to face difficulties in providing basic needs of the population such as food, shelter, housing, and jobs (Lette, 2020).

One of the strategies implemented by the government in overcoming this population problem is the family planning program. The family planning program has an important role in regulating birth and improving the welfare of life (Mindarsih et al., 2018).

National Family Planning Coordinating Board (BKKBN) data in 2014 showed that there

were 8,500,247 PUS (fertile age couples) in 2013 who were new family planning participants and almost half used injection contraception, both 1 month and 3 months injecting (DMPA) (Kemenkes RI, 2014).

NTT community interest in East Nusa Tenggara Province is classified low. This is indicated by data on NTT Health Profile in 2017 that the number of fertile aged couples in NTT was 463,902 couples, actively using family planning only 179,234 couples (38.64%) with an IUD method 15,359 people (8.57%), implants 30,642 people (17.10%), injections 104,894 people (58.52%), condoms 862 people (0.48%), and pill method 14,263 people (7.96%). In Kupang city, acceptors were recorded as acceptors Non Long-Term Contraception Method (LTCM) in 2016 about 45,625 acceptors and Long-Term Contraception Method (LTCM) 3,813 acceptors, with with the choice of using

[✉] Correspondence Address:
Manafe Street No. 17 Kayu Putih Oebobo Distric - Kupang
Email: dexdwi_jegeg@yahoo.com

the largest number of injecting family planning 42,820 (86.6%) (Dinas Kesehatan Kota Kupang, 2016).

These data indicate that the interest in injection contraception, both 1 month and 3 months injection has the highest percentage compared to other types of contraception. DMPA syringe contraception has several side effects namely disruption of menstruation pattern, the return of long time fertility process, and the effect most often experienced by almost all DMPA injection family planning acceptors is an increase in body weight due to long-term use of DMPA injection family planning (Susilowati, 2008). People who experience weight gain continuously and are overweight will be increasingly vulnerable to experiencing increased blood sugar levels as a result of the narrowing of blood vessels by fat activity (Susilowati, 2008).

Weight gain, if not balanced with good consumption patterns and physical activity, will accelerate weight gain which will result in increased levels of cholesterol in the blood and ultimately can cause diabetes mellitus (Ariesthi, 2019). A healthy consumption pattern is the intake of calories derived from carbohydrates recommended 50-60%, fat no more than 30%, and protein between 10-20%; consumption of at least 8 glasses of water a day; and limit salt sugar and oil.

The habit of NTT people consuming rice, coffee or tea every day, using flavoring and consumption of pork which is high in fat, has the potential to increase body weight. In 150 grams of rice contained a glycemic index value of 72, whereas in corn with the same portion, contained a glycemic index value of 48. The glycemic index is high if it is above 70, medium if it is in the range of 56-69, and low if it is located under 55 (Paramashanti, 2019). The glycemic load affects our blood sugar levels. The glycemic load is more focused on how much carbohydrate is absorbed by the body from food, which means that the more servings of carbohydrate foods we eat, the greater the glycemic load our bodies will receive (Winarsih, 2018).

This habit will increase the risk of human blood glucose levels, especially in 3-month injectable family planning acceptors

who have the side effects of increasing body weight. There have been many studies conducted relating to the relationship between the use of injectable birth control with weight gain, but research relating to the use of 3-month injectable birth control to increase blood glucose levels is still very rarely conducted. The relationship of consumption patterns with an increase in blood glucose levels has also been conducted a lot, but research conducted to see the relationship of consumption patterns with an increase in blood glucose levels in family planning acceptors in Kupang city is still rarely.

Considering the importance of maintaining consumption patterns to prevent the increase in blood glucose levels in DMPA injectors, the authors are interested in conducting research on the relationship of consumption patterns with the increase in blood glucose levels in DMPA injection family planning acceptors in Kupang city.

Method

The method used in this research is descriptive research with a cross-sectional design, with the dependent and independent variables measured only once at the same time. The independent variable in this study is the consumption pattern of DMPA injection family planning acceptors, while the dependent variable is the blood glucose level of family planning acceptors. The research respondents are mothers who became DMP injecting family planning acceptors. In the working area of Community Health Center throughout Kupang city, there are 200 people. Data collection is performed in 2 ways, namely secondary and primary data collection. Secondary data is taken from family planning acceptor register data at Community Health Center throughout Kupang city to screen DMPA injection acceptors who have used DMPA injection for a long period of time (more than 1 year or 4 injections). Primary data was carried out through interviews using questionnaire instruments to obtain data on characteristics of respondents, measure blood glucose levels with the autocheck tool, and food recall to see respondents' consumption patterns.

Sampling used is a purposive sampling technique. The inclusion criteria are: (1) respondents have used DMPA injection for

over 2 years or 8 injections, (2) experienced weight gain during the use of contraceptives. Initial data collection was an interview with the help of a closed questionnaire. The questions contained in the questionnaire include the respondent's identity, family, respondent's anthropometric measurements and history of contraceptive use so far. For anthropometric measurements, researchers measure themselves with the help of scales and measuring meters. This measurement is only performed once for one respondent. Primary data collection is conducted from the house to the respondent's house. Each respondent is only checked once a blood glucose level. Interviews and blood samples are taken after the respondent fills out informed consent. Checking blood glucose is conducted before eating so that the measured blood glucose is fasting blood glucose levels. Each respondent uses a different lancet needle (lancet needle is discharged after each respondent is used) to maintain sterility. The use of gloves and alcohol for the sake of maintaining cleanliness is always applied in every respondent's blood draw.

Data analysis is performed using bivariate and multivariate. Bivariate analysis is carried out to see the relationship between the independent variable and the dependent variable and how much its influence would be calculated by Spearman correlation test. Spearman coefficient test is used to see the strength of the relationship between two variables which have an ordinal measurement scale. Multivariate analysis uses multiple logistic regression to analyze the independent variables which have been shown to significantly influence the dependent variable.

Results and Discussion

Subjects in this study are 200 mothers as DMPA injection family planning acceptors. Respondents are selected based on criteria established from the beginning of the study. Analysis of the characteristics of respondents is shown in Table 1.

From table 1, it can be seen that of the 200 samples, most of the samples are of childbearing age which is above 25 years 69.5%, so it is supposed to use contraception. For the education level, most of the samples are in the low education level, junior high school/

equivalent, elementary school and some are even uneducated. Most of the samples are unemployed (as housewives only). For the history of childbirth, samples have more than 2 children. Most study samples have used DMPA injections for 2-4 years, and this has been used for a long time and many respondents often consume sweet foods.

According to Hartanto (2014), ages between 20-35 years are productive ages and require contraception to delay or reduce pregnancy. Many contraceptives that can be used include IUDs, injections, pills, implants, natural methods, and sterilization (Hartanto, 2014). The results of this study are similar to research by Priyanti (2018) conducted at Puri Mojokerto Health Center. The results show that 53.4% of women (20-35 years old) use contraception because they are aware that at this age they are of childbearing age and they must postpone pregnancy (Priyanti & Syalfina, 2018).

For education level, most respondents are in the low education level. This shows that education influences respondents' knowledge about the choice of contraception and the purpose of using it so that respondents know the side effects of the contraception chosen. This is according to research by Maiharti & Kuspriyanto (2012) conducted in Jenu sub-district, Tuban district, showing that respondents who have a poor level of knowledge, use of contraceptive methods are not effective, while respondents who have a good level of knowledge use effective contraceptive methods (Maiharti & Kuspriyanto, 2012).

In terms of work, most respondents do not work (as housewives only) 84%, so respondents are more effective in using contraception. These results are consistent with previous research conducted by Septianingrum, et al (2018) which shows that respondents choose 3-month injection family planning because it is considered quite cheap and affordable, the use is also quite long about every 3 months so it does not interfere with the family economy, with adverse effects minimal (Septianingrum et al., 2018).

For the history of childbirth, respondents who had given birth more than 2 times are the most frequently using DMPA injection which

Table 1. Characteristics of Respondents

Characteristic	Total	%
Age		
≤ 25 years	61	30.5
> 25 years	139	69.5
Education Level		
Low	104	52
High	96	48
Job		
Unemployed	168	84
Work	32	16
Birth history		
1 – 2 children	48	24
>2 children	152	76
Duration of use of DMPA injection KB (year)		
2-4 years	144	72
>4 years	56	28
The habit of consuming sweet foods in a week		
Rarely	80	40
Often	120	60
The habit of consuming fatty foods in a week		
Rarely	136	68
Often	64	32
The habit of consuming salty foods salty foods in a week		
Rarely	80	40
Often	120	60
Blood glucose level		
Normal	168	84
Hyperglycemia	32	16

Source: Primary Data, 2019

is 76%. This is according to research conducted by Indahwati et al., (2017) which shows that parity is related to the choice of contraceptive methods, where most respondents choose Non-LTCM contraceptive methods (Indahwati et al., 2017).

In this study, 72% of respondents had used DMPA injections for 2-4 years. From the 200 respondents who received DMPA injection acceptors used for more than 2 years, 16% experienced an increase in blood glucose levels. This is consistent with previous research conducted by Siti Rahma et al in Gorontalo city in 2019, there are 16 respondents (12.1%) who experienced an increase in blood glucose levels ≥ 126 mg/dl, this is due to the long use of contraception over 10 years and respondents are above 35 years, so this is what causes an

increase in blood glucose levels (Rahma et al., 2019). This is also supported by research conducted by Fatimah Sari in 2017, which finds that in progestin-injecting family planning acceptors, the average blood sugar level is 147.07 g / dl (Sari & Pramestiyani, 2017).

The analysis technique used is the correlation test, so firstly the normality of the data is tested to determine the correlation test technique used. If the data is normally distributed, then the test technique used is Product Moment, whereas if the data is not normally distributed then the test technique used is Spearman Rank. The data normality test uses Kolmogorov Smirnov test. Data is declared normal if the probability value of the data (p-value) > 0.05 . The full normality test is shown in table 2.

Table 2. Data Normality Test Results

Variable	p-value	Result
Blood glucose level	0.000	not normal
Age	0.000	not normal
Education	0.000	not normal
Work	0.000	not normal
Birth history	0.000	not normal
Duration of using DMPA injection family planning	0.000	not normal
The habit of consuming sweet foods	0.000	not normal
The habit of consuming fatty foods	0.000	not normal
The habit of consuming salty foods	0.000	not normal

Source: Primary Data, 2019

Table 3. Bivariate Analysis of the Relationship of Characteristics of Respondents to Respondents' Blood Glucose Levels

Variable	Value	Blood glucose level
Age	r^2	0.289**
	<i>p-value</i>	0.000
Work	r^2	0.107**
	<i>p-value</i>	0.131
Education	r^2	-0.201
	<i>p-value</i>	0.084
Birth history	r^2	-0.010
	<i>p-value</i>	0.886
Duration of using DMPA injection family planning	r^2	0.214**
	<i>p-value</i>	0.002
The habit of consuming sweet foods	r^2	0.356**
	<i>p-value</i>	0.000
The habit of consuming fatty foods	r^2	0.168**
	<i>p-value</i>	0.017
The habit of consuming salty foods	r^2	-0.089
	<i>p-value</i>	0.210

Source: Primary Data, 2019

Data normality test results showed all variables have p -value < 0.05 , so all of them are declared not normally distributed. Therefore, the correlation test used is Spearman Rank correlation test. In this study, bivariate analysis is performed using Spearman test to see the effect of independent variables on the dependent variable. Interpretation of Halfman rank correlation test is divided into three stages: 1) looking at the level of strength (closeness) of relationships between variables; 2) see the direction (type) of relations between variables;

3) see whether the relationship is significant or not. As for the basis for decision making in the Spearman test are: 1) to see the level of strength or closeness of the relationship, it can be seen in the correlation coefficient figure. Correlation is significant if the correlation coefficient > 0.01 ; 2) to see the direction (type) of a positive value relationship, then the relationship between the two variables is unidirectional; 3) to see the significance of the relationship if the Sig. (2-tailed) < 0.005 , it means that the relationship is significant. Bivariate analysis of

the relationship of consumption patterns with an increase in blood glucose levels in DMPA injection acceptor family planning in Kupang city can be seen in table 3.

The age relationship with the increase in blood glucose levels is obtained r-count value 0.289 with p-value 0,000, so it is concluded that there is a relationship of age with an increase in blood glucose levels of DMPA injection acceptor. For the working relationship with the increase in blood glucose levels, the r-count value is 0.107 with p-value of 0.131, so it is concluded that there is no relationship with the increase in blood glucose levels in DMPA injection acceptor. The last education with an increase in blood glucose level has a calculated r-value -0.201 with p-value 0.084, so it is concluded that there is no relationship between the latest education with an increase in blood glucose levels in DMPA injection acceptor. Birth history with an increase in blood glucose levels has r-count -0.010 with p-value of 0.886, so it is concluded that there is no relationship with birth history with an increase in blood glucose levels of DMPA injection acceptor. The duration of the use of DMPA injection has a relationship with an increase in blood glucose levels indicated by the calculated r-value 0.214 with p-value 0.002. The habit of consuming sweet foods has a relationship with an increase in blood glucose levels indicated by the calculated r-value 0.356 with p-value 0,000. The habit of consuming fatty foods with an increase in blood glucose levels has r-count 0.168 with p-value 0.017, so it is concluded that there is a connection with the consumption of fatty foods with an increase in blood glucose levels of DMPA injection acceptor. The habit of consuming salty foods is not associated with an increase in blood glucose levels indicated by the calculated r-value -0.089 with p-value 0.210.

We can conclude that age, work, duration of using DMPA injections, habit of consuming sweet foods, and fatty foods have a relationship with an increase in blood glucose levels. An asterisk (**) means that there is a significant correlation on the significance value 0.01. As for education, birth history, and habit of consuming salty foods have no relationship with an increase in blood glucose levels. The direction of the relationship of age, work,

duration of using DMPA injection KB, habit of consuming sweet foods, and fatty foods has a positive value so that the variable relationship is unidirectional, whereas education, birth history, and habit of consuming salty foods have unrelated relationships. For the significance of the relationship, age, duration of using DMPA injection KB, habits consuming of sweet foods and fatty foods which showed a significant relationship with an increase in blood glucose levels, where p-value <0.05. Work, birth history, and consumption of salty foods are not significantly related to blood glucose levels.

In this study, age had a weak and significant correlation with blood glucose levels. From 200 respondents, 69.5% are over 25 years old. At that age, most respondents are still actively working so that eating patterns are not maintained, lack of rest and lack of exercise, so there is a risk of increasing blood glucose levels. The results of this study are consistent with research conducted by Rudi (2016) in Sintang, where the results of the study showed that there is a relationship between blood sugar levels and respondents aged less than 45 years (Rudi & Kwureh, 2017). In addition, research conducted by Kekenusa (2013) shows that the incidence of diabetes mellitus at the age of 45 years has an 8 times greater risk of experiencing an increase in blood glucose levels (Kekenusa et al., 2013). According to Meysetri et al., (2019), the use of hormonal injection birth control (DMPA injection birth control) and combination pills affect the increase in blood glucose levels in family planning acceptors (Meysetri et al., 2019).

Increased levels of pure glucose (fasting) are also influenced by age. The older a person is, the number of beta cells in the pancreas which functions to produce insulin decreases. Decreased insulin production causes a reduction in the amount of glucose which enters the cell so that glucose will remain in the blood vessels and cause blood glucose levels to increase (Meysetri et al., 2019). Research conducted by Nur Isnaini and Ratnasari at Wangon I Health Center shows that there is a relationship between age and blood glucose levels in the community at Wangon I Health Center. The more a person's age increases, the greater the blood glucose level. In this study, the

age in the case group is between 51-60 years, 22 respondents (41.5%), ages 46-50 years, 13 respondents (24.5%), and aged over 61 years, 9 respondents (16.9%). Age less than 45 years, 9 respondents (17%) (Isnaini & Ratnasari, 2018). Increased age causes changes in carbohydrate metabolism and changes in the release of insulin which is influenced by glucose in the blood and inhibits the release of glucose which enters the cells because it is affected by insulin. If seen from the age of the respondent when he first suffered from DM it can be seen that the increasing age of a person, the greater the level of blood glucose (Ester et al., 2013; Isnaini & Ratnasari, 2018).

In this study, the duration of DMPA injection family planning has a weak and unrelated significant relationship with an increase in blood glucose levels. This is according to research conducted by Hanifa (2019) which shows that there is a significant relationship between types of hormonal contraception, in this case injecting birth control with blood sugar (Hanifa, 2019). The results of this study are supported by research conducted by Rahma (2019) which shows that research respondents who have used hormonal birth control for more than 10 years and are above the age of 35 years have increased blood glucose levels (Rahma et al., 2019). This is caused by prolonged use of contraception which can cause insulin disorders. The use of hormonal contraceptives containing the hormones estrogen and progesterone can cause side effects, one of which is abnormalities in glucose metabolism in the body. This glucose metabolism disorder arises due to the use of hormonal contraception where the hormones estrogen and progesterone contained can affect the action of insulin in the metabolism of sugar so that it can increase blood glucose levels (Rahma et al., 2019).

Women who use hormonal contraception can arise some side effects which is detrimental to the wearer. One side effect is an increase in blood glucose levels, as a result of decreased blood glucose tolerance. DMPA injectable contraception formulations with high doses of progesterone show abnormal glucose tolerance tests on the wearer, with insulin level, increase in the average patient.

Its effect on carbohydrate metabolism will reduce glucose tolerance. Progesterone can also reduce the rate of absorption of carbohydrates from the digestive system. This is related to the androgenic potential of progesterone, as well as the high or low dose of progesterone (Meysetri et al., 2019). In DMPA injection acceptor family planning, weight gain is caused by the hormone progesterone which facilitates the conversion of sugar and fat, so that fat settles a lot under the skin (Pinasti, 2013).

The habit of eating sugary foods in this study showed a significant and strong correlation with the increase in blood glucose levels. This is consistent with previous research conducted by Werdani and Triyanti (2014) which showed a significant relationship between carbohydrate intake and fasting blood sugar levels. Excessive intake (Werdani & Triyanti, 2014). Carbohydrates trigger obesity and insulin resistance. Carbohydrate consumed will be broken down into simple forms, namely glucose which will then be absorbed in the intestine. Glucose will enter the blood circulation. Therefore, excess carbohydrate intake increases glucose levels in the blood. A metabolic study found that diets high in carbohydrates (> 55% of total calorie requirements) increase triglyceride levels and postprandial glucose levels (Mahan et al., 2012; Werdani & Triyanti, 2014). The results of Halton et al. find that people on low carbohydrate diets will have increased insulin sensitivity (Werdani & Triyanti, 2014). The proportions and speed of conversion to glucose differ between carbohydrates, fats, and proteins. Carbohydrates will be converted into 100% glucose at a rate of 1- 1.5 hours. Protein will be converted into 60% glucose at a rate of 2-2.5 hours. While fat will be converted into glucose as much as 10% with a speed 5-6 hours. Because carbohydrates are smaller molecules of protein and fat, carbohydrates are absorbed more quickly into the bloodstream compared to proteins and fats. Excess intake of carbohydrates, proteins, and fats will be stored in the body as a variety of fats or triglycerides (Werdani & Triyanti, 2014).

The eating habits of fatty foods in this study also showed a significant and weak association with the increase in blood glucose levels in DMPA injection acceptors.

Table 4. Multivariate Analysis of the Relationship between Characteristics of Respondents and Increased Levels of Blood Glucose for DMPA Injector Acceptors in Kupang City

No	Sub-variable	B	Wald	Sig.	OR	CI 95%
1	Age	19,968	0,000	0,997	0	0,000-0,000
2	duration of using DMPA injection family planning	0,977	3,675	0,055	2,655	0,978-7,208
3	Sweet food	19,978	0,000	0,996	0	0,000-0,000
4	Fatty food	1,049	4,211	0,040	2,853	1,408-7,767

Source: Primary Data, 2019

This is according to research conducted by Musdalifa in 2017, which shows that a positive relationship between obesity and cholesterol levels (Musalifa et al., 2017). But recent research shows that in addition to fat and carbohydrates, protein in meat can also cause obesity. According to scientists at the University of Adelaide, fats and carbohydrates can be digested faster than protein (Musalifa et al., 2017). The results of Isnaini and Ratnasari's research show that dietary factors $p = 0.031$, which means that there is a relationship between diet and an increase in blood glucose levels in community health center I Wangon. Diet is one of the important components in keeping the body stable and does not risk causing diabetes mellitus cases. The eating patterns in this study are categorized into two, namely the consumption of staple foods in the form of carbohydrates, such as rice, less than seven food spoons per day and sugar consumption less than three tablespoons per day said to be a healthy diet. The staple food in the form of carbohydrates is one of the macronutrients in the body which will be digested and can produce glucose and energy, and some carbohydrates are converted in the form of glycogen in the liver as reserves and stored in the form of fat (Isnaini & Ratnasari, 2018). The main function of carbohydrates for metabolism is to provide energy for cells, including brain cells whose work depends on the supply of carbohydrates in the form of glucose. The condition of lack of blood glucose can cause hypoglycemia, while the condition of excess glucose in the blood causes a condition called hyperglycemia which if the condition continues can increase the risk of developing diabetes (Ester et al., 2013). The high number of sufferers of diabetes mellitus in Indonesia is caused by the habit of eating

habits of Indonesian people who consume too many carbohydrates and the imbalance of consumption with energy needs which if these conditions persist can lead to diabetes mellitus.

From the results of this bivariate analysis, variables that did not affect the increase in blood glucose levels are work, education, birth history and habits of consuming salty foods. While age, duration of using DMPA injection family planning, habits of consuming sweet foods, and habits of consuming fatty foods have a significant relationship and then the multivariate analysis is performed with multiple logistic regression tests. The results of the multivariate analysis can be seen in table 4.

From table 4, it can be concluded that of all the independent variables which are thought to influence blood glucose levels in DMPA injection family planning acceptors, there is one sub variable (consumption of fatty foods) which is most influential on increasing blood glucose levels with p -value $0.040 < 0.05$. The largest OR value obtained is 2.853 which means that the habit of consuming fatty foods has 2.853 times chance to cause an increase in the level of blood glucose in DMPA injection family planning acceptor.

The habit of NTT people consuming borse corn with pork will affect blood cholesterol levels. Pork does have the highest unsaturated fat content compared to other meat, but if consumed in excess will cause obesity (Kim et al., 2015). In addition to meat consumption, the habits of NTT people consume fried, well know contents, fried bananas, fried soybean cake, and other fried foods also have the potential for obesity. Research by researchers shows that frequent consumption of fatty foods (more than 3 times a week) has a significant relationship with increased blood

glucose levels. An increase in blood sugar is also related to cholesterol levels in the blood caused by obesity. Blood contains 80% of cholesterol produced by the body itself and 20% comes from food. Cholesterol produced consists of 2 types of HDL cholesterol and LDL cholesterol. When an excessive amount of LDL cholesterol in the blood will be deposited on the walls of blood vessels and form clots which can clog arteries, while HDL cholesterol has the function of cleaning blood vessels from excessive LDL cholesterol. In addition, there are triglycerides which are formed as a result of food metabolism in the form of fat and also in the form of carbohydrates and excessive protein, which are not all needed as a source of energy (Mahendri, 2015). This is according to research conducted by Musdalifa in 2017 which shows that a positive relationship between obesity and cholesterol levels. Obese people do not always have high cholesterol levels. High cholesterol is not always affected by obesity but can be influenced by the consumption of foods which contain lots of cholesterol such as consuming meat, organ meats, and eggs which can increase blood cholesterol levels because in foods such as meat, organ meats, and eggs there is sufficient cholesterol content high (Musdalifa et al., 2017).

An increase in excess obesity indicates a significant amount of fat is stored in the body and certainly there will also be fat found in the blood. Being overweight can cause high cholesterol, heart disease, diabetes, and other serious illnesses. Obesity is an abnormality in the number of lipids in the blood, one of which is an increase in cholesterol. An increase in total cholesterol in the blood > 240 mg / dl is referred to as hypercholesterolemia (WHO, 2013; Musdalifa et al., 2017). Consumption of fats and oils is recommended at least 10% of energy needs and no more than 30% of total energy needs (Sugiyanto, 2017). This is in line with the recommendations of the dietary guidelines, namely the consumption of fat not less than 10% of calorie needs per day (Agriculture & Services, 2010; Sugiyanto, 2017). But recent research shows that in addition to fat and carbohydrates, protein in meat can also cause obesity. According to scientists at the University of Adelaide, fats and carbohydrates

can be digested faster than protein. However, if there is little energy expended, fat will be stored in the body and used again if needed. Fats and carbohydrates in food supply enough energy to meet daily needs. Because meat protein is digested more slowly than fat and carbohydrates, this makes the energy we receive from surplus protein which is then converted and stored as fat in the human body (Lusinda, 2016).

Conclusion

Variables of age, duration of using DMPA injection family planning, habits of consuming sweet food and fatty food have an effect on increasing blood glucose levels. However, after passing multivariate analysis, only the habit of consuming fatty foods which significantly or significantly influences the blood glucose level of DMPA injection family planning acceptor. While age, duration of using DMPA injection, and habit of consuming sweet foods are confounding variables, which means that they are variables that influence the relationship between independent and dependent variables. The biggest OR value is the habit of consuming fatty foods so that this variable is the most dominant variable affecting blood glucose levels.

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