International Journal of Social Science (IJSS)
Vol.2 Issue.4 December 2022, pp: 2051-2056
ISSN: 2798-3463 (Printed) | 2798-4079 (Online)
DOI: https://doi.org/10.53625/ijss.v2i4.5047

THE EFFECT OF DIET SHOF (SIXTEEN HOUR OF FASTING) ON TRIGLYCERIDE LEVELS IN OVERWEIGHT ADOLESCENTS

By
Khotimah[1], Herin Mawarti[2]
[1]Departemen Keperawatan Medikal Bedah, Program Studi S1 Keperawatan, Fakultas Ilmu Kesehatan, Universitas Pesantren Tinggi Darul 'Ulum Jombang
[2]Departemen Keperawatan Dasar, Program Studi S1 Keperawatan, Fakultas Ilmu Kesehatan, Universitas Pesantren Tinggi Darul 'Ulum Jombang
Email: [1]khotimahhasan@yahoo.com

Article Info
Article history:
Received Sept 06, 2022
Revised Oct 18, 2022
Accepted Nov 27, 2022

Keywords:
Diet shof, Trigliserida, Overweight.

ABSTRACT
Body weight exceeding normal body weight (Overweight) is a cause of increased triglyceride levels. High triglyceride levels (hypertriglyceridemia) are a risk for coronary heart disease and diabetes mellitus. Efforts that can be made to reduce hypertriglyceridemia is to reduce the number of meals with the shof diet (sixteen hours of fasting). During fasting triglycerides will be mobilized to produce energy or synthesized into glucose. The aim of this study was to determine the effect of the shof diet on reducing triglyceride levels in overweight adolescents. The research design used the Pre-Experiment One Group Pretest-Postest Design with a population of all female students of the Faculty of Health Sciences who experienced overwight as much as 25. The number of samples was 20 with a sampling technique using purposive sampling. The research instrument uses an observation sheet. Data were analyzed using the Wilcoxon test with a P value ≤ α (α = 0.05). The results showed that the value of P = 0.646, which means that there was no effect of the shof diet on reducing triglyceride levels. However, in terms of quantity, there was a decrease in triglyceride levels in most of the respondents. The shof diet can reduce triglyceride levels by controlling food consumption during the fasting window.

Corresponding Author:
Khotimah
Departemen Keperawatan Medikal Bedah, Program Studi S1 Keperawatan, Fakultas Ilmu Kesehatan, Universitas Pesantren Tinggi Darul 'Ulum Jombang
Email: khotimahhasan@yahoo.com

1. INTRODUCTION

Triglycerides are a type of blood fat (lipid) which participates in the composition of lipoprotein molecules and functions as a means of energy transportation and energy storage (Lipid Update, 2012). Triglycerides are formed from esterification of the three hydroxyl groups of glycerol with fatty acids (Murray, et al., 2009). The process of forming triglyceride levels when food enters the body that contains lots of carbohydrates & cholesterol is then processed by the liver into fatty acids, which eventually form triglycerides (Graha, 2010). In the process in the human body, triglycerides will enter the blood plasma area after being absorbed by the intestine and then distributed to all organs in the body. These flowing triglycerides will later be formed in the form of a lipoprotein calledVLDL (Very Low Density Lipoprotein) (Bansal et al., 2007). High triglyceride levels in the blood should be seen as a red flag. Increased triglyceride levels can be caused by conditions of being overweight (obesity), excessive sugar consumption, alcohol consumption, and lack of physical activity, which causes a buildup of triglycerides in the blood (Irawati, et al, 2020).Overweight Many occur due to lifestyle changes, fast food consumption patterns which tend to be high in energy (fat, protein, carbohydrates) and low in fiber, and lack of activity (Adriani & Wirjatmadi, 2012). The phenomenon of fast food is a form of social culture that changes appetite, eating patterns that are unhealthy and excessive in quality

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and quantity, eating snacks at leisure and consuming more carbohydrates and fats,and less aware of the importance of exercise for health, especially as a prevention of obesity (Aini, 2013).

The prevalence of obesity in Indonesia in the adult age group is 11.7% andOverweight as much as 10.0%. The overweight rate for women is higher than for men, namely 25.9% for women and 16.3% for men (Hidayati, 2016). Overweight and obesity is a global problem and WHO estimates that by 2015 around 2.3 billion adults worldwide will be overweight and more than 700 million people will be obese. In the UK, obesity rates have nearly doubled in the last 18 years from 13% of men and 16% of women in 1993, to 24% of men and 26% of women in 2011. In the same year, around 3 in 10 children aged 2-15 years found to be overweight or obese. Ethnic differences exist in the prevalence of obesity and associated health risks (Jane et al., 2015). The impact when triglycerides are high is an increased risk of coronary heart disease (Amelia & Syauqy, 2014). The risks of coronary heart disease that can occur include myocardial infarction, cardiac ischemia and atherosclerosis. High levels of triglycerides (hypertriglyceridemia) can also be associated with insulin retention which can lead to diabetes mellitus. Therefore, the effort that can be made to reduce high levels of triglycerides is to reduce the amount of excessive food, namely by adopting a healthy lifestyle such as regulating diet or reduce the consumption of carbohydrate foods (Aini, 2013).

Diet shof (sixteen hour of fasting) is a method of regulating diet by fasting for sixteen hours. Fasting causes various changes in the body, especially changes in metabolism in the body. During the fasting period the body does not get glucose intake which is the main ingredient in metabolism. The body enters fasting time after 8 hours where all the digestive processes have been completed. Under normal circumstances glucose will be converted into glycogen in the liver, but due to fasting all glucose will be used to produce energy (Corbuzier, 2015). After 8 hours of fasting, glucose in the blood will decrease, so to produce energy, the body will use glycogen reserves in the muscles and liver by means of gluconeogenesis. The main substrates for gluconeogenesis are amino acids, glycerol and triglycerides (Guyton and Hall, 2018). Triglycerides are the main source of energy during fasting. When insulin levels fall and glucagon levels increase, adipose triglycerides are mobilized by lipolysis which produces glycerol and fatty acids. Glycerol is metabolized to form pyruvic acid, then pyruvic acid is oxidized to produce energy or synthesized into glucose (Murray, et al, 2009). Fatty acids will be oxidized to produce ketones which are used as energy-producing fuel for muscles, heart, liver, kidneys and adipose tissue (Guyton and Hall, 2018).
obtained, the data is tabulated and tested using analysisPaired T-Test with a significance level of $\alpha < 0.05$. But due to the assumption of normality of data

2. METHOD

This researcher uses the methodPre Eksperiment One Group Pretest-Postest Design. The study population was all female students of the Faculty of Health Sciences at Darul Ulum Jombang University Islamic Boarding School who were overweight and obese as many as 25 people. The research sample based on the research criteria is 20 respondents. The sampling technique used simple random sampling technique. The research instrument used observation sheets and tools to measure triglyceride levels usingspectrophotometer with reagents available in the Setia Husada Jombang laboratory. The research process was carried out by giving the shof diet treatment (sixteen hours of fasting) by means of which all respondents fasted for sixteen hours. Fasting starts at 20.00 WIB until 12.00 WIB. During fasting the respondent is only allowed to drink water or non-calorie water, then the respondent is allowed to eat (eating window) starting at 12.00 WIB until 20.00 WIB. During the eating window, respondents are allowed to consume food in moderation, not to overdo it as they usually eat. The shof diet is given for ten consecutive days. The data collection process began by measuring triglyceride levels before being given the shof diet and after ten days being given the shof diet. Prior to data collection, this research was declared ethically feasible, so that it could proceed with the data collection process. After data are not met, the statistical test is carried out using a non-parametric test, namely the Wilcoxon test.

3. RESULTS AND DISCUSSION

Table 1. Characteristics of RespondentsOverweight by Fmelbag of Health Sciences Unipdu Jombang

No	Characteristics of Respondents	Σ	%
1	Age		
	20 Years	4	20
	21 Years	4	20
	22 Years	8	40
	23 Years	2	10
	24 Years	2	10

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	Total	20	100
2	Weight		
	55-60 Kg	14	80
	61-45 Kg	6	10
	Total	20	10
3	Height		
	150-155 cm	16	40
	156-160 cm	2	40
	>161 cm	2	20
	Total	20	100

Based on table 1, it describes the characteristics of respondents based on age, weight and height. Based on age, all respondents were almost the same age, namely between the ages of 20 and 24, while the most dominant age was at the age of 22 with 4 (40%) respondents. Characteristics based on body weight, the average weight is between 55-60 kg by 7 (70%) respondents, while the height of the respondents is mostly 150-155 cm by 8 (80%) respondents.

Table 2. Frequency Distribution of Body Mass Index (BMI) among RespondentsOverweight by FCollege of Health Sciences Unipdu Jombang Body Mass Index

Body mass index	Σ	%
23	8	40
24	8	40
28	4	20
Total	20	100

Based on table 2, the frequency distribution is based on the youth BMIOverweight in the Faculty of Health Sciences Unipdu Jombang, 4 respondents (40%) had a BMI of 23 kg/m, and 4 respondents (40%) of BMI and 24 kg/m, and a small portion of 28 kg/m BMI of 2 respondents (20%)).

Table 3. Blood Triglyceride Level at RespondentOverweight in the Faculty of ScienceHealth Unipdu Jombang

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Pre-Post Trigriserida	Σ	%	Σ δ (Delta)
Decrease	12	60	0,4
Increase	8	40	1,6
Total	20	100	2

Based on table 3. Blood triglyceride levels in adolescentsOverweight at the Faculty of Health Sciences Unipdu Jombang. Triglyceride levels before and after treatment decreased by 12 (60%) respondents while those who experienced increased triglyceride levels before and after treatment were 8 (40%) respondents.

Table 4. The Effect of the Shof Diet on Triglyceride Levels in RespondentsOverweight at the Faculty of Health Sciences UnipduJombang

	Mean	(Min-Max)	St.Dev	P-Value*
Before	116,00	85-267	54,066	0.646
After	119,80	84-258	50,281	

*Wilcoxon test

Based on table 4. The average value of triglyceride levels before being given the shof diet was 116 mg/dl and the average value of triglyceride levels after being given the shof diet was 119.8 mg/dl. While the standard deviation value of triglyceride levels before being given the shof diet was 54.066 while the standard deviation value of triglyceride levels after the shof diet was 50.281. Statistical test resultswilcoxon before and after being given a large shof diet 0.646 (themselves0.646).

DISCUSSION

The results showed that most of the respondents experienced a decrease in triglyceride levels after being given a shof diet (sixteen hour of fasting). Fasting was given for sixteen hours from 20.00 to 12.00, then the respondent was allowed to eat from 12.00 to 20.00 for ten days.Fasting or Fasting is a restriction on the intake of drinks and food into the body. The body will experience various changes during fasting, the main changes occur in metabolism caused by

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the body not getting glucose intake which is the body's main energy source (Corbuzier, 2015). After eight hours of fasting, glucose in the blood will decrease, so to produce energy, the body will use glycogen reserves in the muscles and liver by means of gluconeogenesis. The main substrates for gluconeogenesis are amino acids,

Fat then becomes glycerol and fatty acids and releases them into the blood vessels. Cells that need these components are then burned and produce energy, carbon dioxide (CO2) and water (H2O

(Guyton and Hall, 2018). This is in line with Bansal's research, 2007 which stated that there was a difference in triglyceride levels between the group that fasted for 4 hours and the group that did not fast.

Based on the results of statistical tests, a significance value of 0.646 was obtained, meaning that there was no effect of the shof diet on blood triglyceride levels in obese adolescents. There was no effect of treatment on triglyceride levels due to the presence of several respondents whose triglyceride levels experienced an increase with an average increase that was quite high. Although most of the respondents experienced a decrease in triglyceride levels after treatment, the decrease in triglyceride levels in the majority of respondents was relatively small. If the average value of triglyceride levels is calculated after being given the shof diet, the average value obtained is greater than the average value before being given the shof diet. So that the average value of triglyceride levels before and after treatment increased. Even though in terms of quantity the respondents who experienced decreased triglyceride levels were more than the respondents who experienced increased triglyceride levels. Respondents who experienced increased triglyceride levels after the shof diet occurred because the respondents consumed more food during the feeding window. Triglyceride levels are influenced by food intake factors, where each fatty food contains lots of triglycerides (Adam, 2009). Triglyceride levels are synthesized from fat, carbohydrates and protein (Guyton and Hall, 2018). Triglyceride levels are influenced by food intake and physical activity. Intake that affects triglyceride levels includes intake of saturated fat, carbohydrates and fiber (Wijayanti, 2017). Other factors that influence the occurrence of an increase in triglycerides are alcohol consumption, overweight/obesity, eating fatty foods, eating sugar, increasing body weight and diets high in sugar or fat (Hidayati, 2016). This is in line with research conducted by Putri et al., (2017), there is a relationship between carbohydrate, protein, fat intake on triglyceride levels. Carbohydrate intake is the biggest contributor to increased triglyceride levels. Sixteen hour fasting is a fast that can reduce body weight and triglyceride levels which tend to be slow. However, it has greater power than twelve-hour fasting. To get the best effect, it must be combined with a low-carbohydrate diet (Moore, J. & Fung, 2017). The research results obtained showed that there was no effect of fasting on triglyceride levels. Triglyceride levels decreased after undergoing sixteen hours of fasting within a period of 1 month (Kinanthi, 2017). Meanwhile, according to Aprilya (2014) said that excessive fat intake can increase blood sugar levels, besides that, fat intake excess can trigger an increase in the amount of fat in the body and obesity so that it can affect triglyceride levels inoverweight.

Respondents who experienced increased triglyceride levels after being given the shof diet treatment, some respondents had a Body Mass Index in the obesity category. According to researchers (Nisa et al., 2017) fat intake is strongly related to triglyceride levels. Most of the fat contained in food (± 90%) will be converted into triglycerides. The increase in triglycerides reaches its peak after consuming a high fat intake three to five hours. Chylomicron triglycerides are normally rapidly metabolized within 15 minutes. Diet can make plasma triglyceride levels fluctuate. So that it can cause triglycerides to increase again during the examination.

4. CONCLUSIONS

The results show that the shof diet can partially reduce triglyceride levels in adolescentsoverweight. A few others experienced increased triglyceride levels. For future research, to carry out tighter control over nutrient consumption during the eating window because respondents have a tendency to eat more after fasting for sixteen hours. Increasing the number of samples and increasing the time for carrying out the shof diet for more than ten days will reduce errors in research.

5. AKNOWLEDGEMENTS

Our thanks go to Darul Ulum Jombang Higher Islamic Boarding School University, Dean of the Faculty Jombang Unipdu Health Sciences, respondents and all parties who have helped complete this research.

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International Journal of Social Science (IJSS)
Vol.2 Issue.4 December 2022, pp: 2051-2056
ISSN: 2798-3463 (Printed) | 2798-4079 (Online)

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