

The Effect Of Duration Of Tuak Consumption On Low Density Lipoprotein (LDL) And Triglyceride (TG) Levels In The Community In Taman Bali Village

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ABSTRACT

Tuak is a traditional alcoholic drink made from palm sap. Excessive alcohol consumption over a long period of time can affect lipid metabolism, increasing LDL and Triglyceride levels in the blood. Increased levels can cause cardiovascular disease. To determine the effect of the duration of tuak consumption on LDL and Triglyceride levels in the community in Dusun Taman Bali. The research used is Observational Analytical with a cross-sectional approach. The sample in this study was the community in Dusun Taman Bali who consumed Tuak for 1, 3, and 5 years with a total of 30 respondents using One Way Anova data analysis. The average LDL levels of 30 respondents with an average of 117.20 mg/dL consumed tuak for 1 year, 130.30 mg/dL for 3 years and 151.20 mg/dL for 5 years, while the average Triglyceride levels of 30 respondents who consumed Tuak for 1 year were 160.90 mg/dL, 166.60 mg/dL for 3 years and 201.10 mg/dL for 5 years. The results obtained showed a significant value of LDL levels of 0.000 while Triglyceride levels were 0.022. This means $P < 0.05$, which means that there is an effect of the duration of tuak consumption of 1.3 and 5 years on LDL and Triglyceride levels in the community in Dusun Taman Bali.

INTRODUCTION

Alcohol is a drink that contains a chemical in the form of ethanol. Ethanol is a non-electrolyte liquid chemical that is soluble in fat so that it is easily circulated in the blood circulation and absorbed in the digestive tract (Arissandi, Setiawan, & Wiludjeng 2019). Tuak is one of the traditional drinks that contain alcohol (Sasmita, 2020). Based on research conducted (Firmando, 2020), the alcohol content in the tuak is on average 4% depending on the process and the duration of fermentation. This drink is produced through a fermentation process from palm sap.

According to the World Health Organization (WHO) in 2018, the death rate due to alcohol consumption worldwide reached 3 million deaths per year or 5.3% of the overall death rate. In the case of deaths caused by alcohol consumption, men are more than women, which is 2.3 million deaths (Hanifah, 2023). Based on data from the Basic Health Research (Riskesdas) in 2018, the proportion of alcoholic beverage consumption in the population in Indonesia is 241,000,000 at the age of more than 10 years and has consumed alcohol as much as 3.3 liters per capita (Wahyuni, 2023). From Riskesdas data, it was noted that adolescents

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who consume alcohol in West Nusa Tenggara increased significantly in 2018 to 38.7% of the total number of adolescents around 99.09 million people (Sari, 2019).

One of the impacts caused by consuming alcohol in excess is cardiovascular disease. Cardiovascular disease is characterized by increased levels of Low Density Lipoprotein (LDL) or bad cholesterol and Triglycerides (Siregar et al., 2020). LDL or bad cholesterol is a lipoprotein that transports cholesterol from the liver to all body tissues. When this cholesterol level is high in the blood, plaque will form on the walls of blood vessels causing narrowing or inhibiting blood flow which ultimately triggers atherosclerosis (Susiwati et al., 2018). Triglycerides are the main form of lipids in adipose tissue, this lipid form will be released after hydrolysis by the hormone-sensitive lipase enzyme into free fatty acids and glycerol (Cora, 2019). Increased LDL and Triglyceride levels in the blood can be influenced by several factors, including genetics, age, gender, physical activity and exercise, and food and beverage consumption (Juliani et al., 2017). Efforts to control LDL and Triglyceride levels include lifestyle changes with a diet low in saturated fat, exercise, and medications to lower cholesterol and Triglyceride levels (Yani, 2015).

Previous research conducted by (Cora, 2019) showed that there was a relationship between the amount of alcohol consumption and Triglyceride levels in students of Sam Ratulangi University Manado. And research obtained by (Fitria and Oktavia, 2023), said that there is an effect of alcohol consumption on Triglyceride and High Density Lipoprotein (HDL) levels in the blood.

The habit of the people in Taman Bali Hamlet is to consume tuak. Many people in Taman Bali Hamlet have started consuming alcohol since they were teenagers to adults. The people in this hamlet also often consume alcohol every day. If you consume tuak for a long period of time, it can increase LDL and Triglyceride levels in the blood.

Based on this background, the researcher is interested in finding out the effect of the length of Tuak consumption in the community in Taman Bali Hamlet on the examination of Low Density Lipoprotein (LDL) and Triglyceride (TG) levels which are measured based on the duration of consumption, namely 1, 3 and 5 years.

MATERIALS/METHOD

The research conducted was by an Observational Analytical research design with a cross sectional approach. The research was carried out in Taman Bali Hamlet, Sepakek Village, Pringgarata District, Central Lombok Regency. From January to April 2025. The population in this study is people in Taman Bali Hamlet who consume tuak. The sample used in this study was people in Taman Bali Hamlet who consumed alcohol for 1, 3 and 5 years. With a total of 30 respondents. The sampling technique used in this study uses a non-random sampling technique with the type of Purposive Sampling. The independent variable in this study was the duration of consumption of tuak. The bound variables in this study were Low Density Lipoprotein (LDL) and Triglyceride (TG) levels. The results of the examination of Low Density Lipoprotein (LDL) and Triglyceride (TG) levels in people in Taman Bali Hamlet who consumed Tuak for 1, 3 and 5 years were presented in the form of a table and then the data obtained were analyzed using the One Way Anova test.

RESULTS

The results of the study on LDL and Triglyceride levels in people who consumed Tuak for 1, 3 and 5 years with a total of 30 samples. The results of the examination can be seen in tables 4.1, 4.2 and 4.3 as follows:

Table 4. 1 Results of LDL and TG levels examination of those who consume Tuak for 1 year

No	Kode Sampel	Umur (tahun)	Kadar	
			LDL (mg/dL)	TG (mg/dL)
1	A1	27	104	129
2	A2	20	115	134
3	A3	24	108	122
4	A4	28	131	205
5	A5	21	113	140
6	A6	19	151	165
7	A7	22	102	161
8	A8	23	115	188
9	A9	17	120	145
10	A10	17	113	220
Kadar Tertinggi			151	220
Kadar Terendah			102	122
Rata-rata			117,20	160,90

Based on Table 4.1, it shows that the average LDL level of consuming Tuak for 1 year was the highest of 151 mg/dL and the lowest level was 102 mg/dL. Meanwhile, the average TG level was the highest of 220 mg/dL and the lowest was 122 mg/dL of 10 respondents.

Table 4. 2 Results of LDL and TG levels examination of those who consume Tuak for 3 years

No	Kode Sampel	Umur (tahun)	Kadar	
			LDL (mg/dL)	TG (mg/dL)
1	B1	27	117	160
2	B2	28	135	193
3	B3	45	111	161
4	B4	21	138	135
5	B5	18	135	145
6	B6	40	110	96
7	B7	44	152	210
8	B8	45	125	200
9	B9	30	137	210
10	B10	21	143	156
Kadar Tertinggi			152	210
Kadar Terendah			110	96
Rata-rata			130,30	166,60

Based on Table 4.2, it shows that the average LDL level of consuming Tuak for 3 years was the highest of 152 mg/dL and the lowest level was 110 mg/dL. Meanwhile, the average TG level was 210 mg/dL and the lowest was 96 mg/dL from 10 respondents.

Table 4. 3 Results of LDL and TG levels examination of those who consume Tuak for 5 years

No	Kode Sampel	Umur (tahun)	Kadar	
			LDL (mg/dL)	TG (mg/dL)
1	C1	55	160	160
2	C2	31	165	182
3	C3	60	141	201
4	C4	34	175	193
5	C5	60	127	205
6	C6	52	133	176
7	C7	54	167	224
8	C8	33	152	240
9	C9	55	149	240
10	C10	60	143	190
Kadar Tertinggi			175	240
Kadar Terendah			127	160
Rata-rata			151,20	201,10

Based on Table 4.3, it shows that the average LDL level of consuming Tuak for 5 years was the highest of 175 mg/dL and the lowest level was 127 mg/dL. Meanwhile, the average TG level was the highest of 240 mg/dL and the lowest was 160 mg/dL of 10 respondents.

The normality test uses the Shapiro Wilk statistical test. The test of normality of research data can be seen in Table 4.4.

Table 4. 4 Normality Test

Lama Konsumsi Tuak		Shapiro-Wilk		
		Statistic	df	Sig.
LDL	1 tahun	0,848	10	0,056
	3 tahun	0,931	10	0,459
	5 tahun	0,975	10	0,932
TG	1 tahun	0,919	10	0,351
	3 tahun	0,928	10	0,424
	5 tahun	0,948	10	0,641

Based on Table 4.4, the results were obtained that the two data were normally distributed with a Sig. P value of > 0.05 . If it is distributed normally, it is continued to the parametric test, namely the One Way Anova test.

The research data showed that it was distributed normally and homogeneously, so the One Way Anova test was carried out which can be seen in Table 4.5.

Table 4. 5 Test One Way Anova

Anova						
		Sum of Squares	df	Mean Square	F	Sig.
LDL	Between Groups	5881,400	2	2940,700	13,635	0,000
	Within Groups	5823,300	27	215,678		
	Total	11704,700	29			
TG	Between Groups	9462,600	2	4731,300	4,437	0,022
	Within Groups	28788,200	27	1066,230		
	Total	38250,800	29			

Based on Table 4.5, the results were obtained that the Sig value at the LDL level was 0.000 while the Triglyceride level had a Sig value of 0.022 where the P value was < 0.05 . This means that there is an effect of the length of Tuak consumption on LDL and Triglyceride levels in the community in Taman Bali Hamlet.

DISCUSSION

The results of the study show that the longer a person consumes tuak, the LDL and Triglyceride levels in the blood tend to increase. This is in line with the theory that long-term alcohol consumption can affect the body's lipid metabolism.

The effect of Tuak consumption for 1 year from 10 respondents (33.3% of the total sample), the average LDL level was 117.20 mg/dL, and the Triglyceride level was 160.90 mg/dL. The level was above the optimal value for LDL levels < 100 mg/dL while TG levels were < 150 mg/dL. This is likely due to the initial effects of ethanol metabolism that increase lipid synthesis in the liver. Respondents in this group were mostly in their late teens (17–25 years), who according to Sukiman et al. (2019), are prone to consuming alcohol due to social factors and curiosity. High physical activity in this age group may also hold back the rate of increased lipids in the blood.

The effect of Tuak consumption for 3 years as many as 10 respondents (33.3%) consumed Tuak for 3 years with an average LDL level of 130.30 mg/dL and Triglycerides of 166.60 mg/dL. LDL levels in this group have been included in the high-limit category, and TG levels exceed normal limits. This increase indicates the cumulative effect of alcohol consumption on the body's fat metabolism. According to Cora (2019), alcohol consumption for more than two years can lead to fat buildup in the liver, which will trigger an increase in LDL and VLDL production. The dominant age group in this group is early adults (26–35 years), who may have decreased physical activity and begin to experience work stress, two factors that affect lipid profiles (Azizi et al., 2018).

In the 5-year consumption group, which also consisted of 10 respondents (33.3%), there was a significant increase with an average LDL level of 151.20 mg/dL and Triglycerides of 201.10 mg/dL. Significant increase in lipid levels due to long-term exposure to ethanol, which affects liver enzyme activity, increases fat synthesis and decreases the effectiveness of lipoprotein lipase. According to Klop et al. (2013), chronic alcohol consumption can decrease insulin sensitivity, cause insulin resistance and increase atherogenic lipoprotein production. In addition, this group was dominated by elderly

respondents (46–60 years), who physiologically experienced decreased lipid metabolism and physical activity, and were more prone to dyslipidemia (Aryani et al., 2023).

Factors that affect LDL and Triglyceride levels include age, gender, physical activity, diet, and duration of alcohol consumption. In this study, all respondents were men, who according to Susanti (2021), had a higher risk of experiencing an increase in LDL than women of productive age. In addition, a high-fat diet and smoking habits were also found to trigger increased lipid levels.

Research by Cora (2019) showed a positive relationship between alcohol consumption and Triglyceride levels in Sam Ratulangi University students. This study is consistent with current findings that alcohol consumption, especially alcohol, can increase lipid levels. Fitria and Oktavia (2023) also found that alcohol consumption had a significant impact on HDL and Triglyceride levels in adult respondents in Padang City. In addition, a study from Errisya (2024) states that long-term alcohol consumption causes changes in liver function, which directly affects lipid metabolism.

The results of the One Way Anova test showed a significance value of 0.000 for LDL and 0.022 for Triglycerides ($p < 0.05$), which means that there was a significant influence of lipid levels between groups based on the duration of consumption of tuak. Thus, the longer the duration of consumption, the higher the measured LDL and TG levels.

CONCLUSIONS

There is an effect of the length of Tuak consumption (1, 3 and 5 years) on LDL and Triglyceride levels in the community in Taman Bali Hamlet.

REFERENCE

- Arissandi, D., Setiawan, christina T., & Wiludjeng, R. (2019). Aktivitas Serum Glutamic Pyruvic Transaminase (SGPT) Pada Pengkonsumsi Minuman Beralkohol. *Jurnal Borneo Cendekia*, 3(2), 40–46.
- Cora, D. I. (2019). Hubungan Konsumsi Alkohol Dengan Kadar Trigliserida Pada Mahasiswa. *Jurnal Medik Dan Rehabilitasi (JMR)*, 1(3), 3–6.
- Firmando, H. B. (2020). Kearifan Lokal Minuman Tradisional Tuak Dalam Merajut Harmoni Sosial Di Tapanuli Bahagian Utara. *Aceh Anthropological Journal*, 4(2), 197. <https://doi.org/10.29103/aaj.v4i2.3121>
- Fitria dan Oktavia. (2023). Pengaruh konsumsi alkohol terhadap kadar trigliserida dan hdl dalam darah. *Jurnal Pharma Bhakta*, 3(1), 27–33.
- Hanifah, L. N. (2023). Literature Review: Factors Affecting Alcohol Consumption and the Impact of Alcohol on Health Based on Behavioral Theory. *Media Gizi Kesmas*, 12(1), 453–462. <https://doi.org/10.20473/mgk.v12i1.2023.453-462>
- Juliani, R., Dharmawan, O., & Parwati, A. (2017). Gambaran Kadar Low Density Lipoprotein (LDL) Pada Remaja Perokok Dan Bukan Perokok Di Dusun Buyan , Desa Pancasari , Kecamatan Sukasada , Buleleng , Bali. *Chemistry*, 4(Ldl), 39–44.

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- Sari, R. J. (2019). *Faktor yang Mempengaruhi Penyalahgunaan Minuman Beralkohol di Kalangan Remaja Putra di Desa Rato Kecamatan Bolo Kabupaten Bima Tahun 2019*. 28–38.
- Sasmita, S. (2020). *Karakteristik dan Indeks Massa Tubuh Pecandu Tuak di Kelurahan Botang Kecamatan Makale Kabupaten Tana Toraja. 1*.
- Siregar, M. H., Fatmah, F., & Sartika, R. (2020). Analisis Faktor Utama Kadar Trigliserida Abnormal Pada Penduduk Dewasa Di Indonesia. *Jurnal Delima Harapan*, 7(2), 118–127. <https://doi.org/10.31935/delima.v7i2.104>
- Susiwati, RS, S., & Farizal, J. (2018). Analisis Kolesterol Low Density Lipoprotein (Ldl) Pada Pengkonsumsi Produk Minuman Herbal “X” Kota Bengkulu Tahun 2017. *Journal of Nursing and Public Health*, 6(2), 95–99. <https://doi.org/10.37676/jnph.v6i2.661>
- Wahyuni, S. (2023). Gambaran Perilaku Mengkonsumsi Alkohol Terhadap Kekebalan Tubuh (Imun) pada Masyarakat di Desa Kampung Tengah Pancur Batu Kabupaten Deli Serdang provinsi Sumatera Utara. *JK: Jurnal Kesehatan*, 1(2), 352–359.
- Yani, M. (2015). Mengendalikan Kadar Kolesterol Pada Hiperkolesterolemia. *Olahraga Prestasi*, 11(2), 3–7. <https://doi.org/10.1017/CBO9781107415324.004>