



Analysis of total cholesterol levels in public infrastructure and facilities officers (petugas PSU) in Kelurahan Rawa Buaya Jakarta Barat

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Abstract

Background: The basic need for food must be fulfilled by humans as a fulfillment of energy sources in carrying out activities. Consumption of fat macromolecules has the highest energy compared to other macromolecules. However, excessive consumption of fat can also increase cholesterol in the blood. Public Infrastructure and Facilities Officers (PPSU) do a lot of outdoor work so it is possible to have unhealthy eating habits such as frequently consuming fatty foods. **Objectives:** The purpose of this study was to determine qualitatively the distribution of total cholesterol levels in PPSU in Rawa Buaya Village. This research is descriptive-analytic. **Materials and Methods:** The research sample was obtained using a purposive sampling technique with inclusion and exclusion criteria involving 67 respondents. **Results:** The results showed that the majority of respondents were male, with 65 respondents (97%). From the results of the age group category, 24 people (35.8%) were dominated by respondents aged 31-40 years. **Conclusions:** The overall average cholesterol level of respondents is 201 mg/dL. If distributed by gender, female respondents have an average total cholesterol level of 237 mg/dl and men have an average total cholesterol level of 200 mg/dL.

Keywords

Analysis, Facilities Officers, Total cholesterol level.



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1. Introduction

The basic human need that must be met every day is food, a person consumes food that his body needs to obtain energy to carry out daily activities. Changes in people's eating habits are dominated by the consumption of foods high in fat and low in fiber, smoking lifestyles, and lack of activity. This can cause many diseases to arise (Hariawan, H., et al., 2019). Humans consume food consisting of macromolecules such as carbohydrates, proteins, lipids or fats, vitamins, and minerals. Fat can indeed be used as an energy source for the human body, especially as fat has the greatest energy compared to other macromolecules consumed by humans (Diniyyah, et al., 2017). However, if someone

consumes excessive fat it can also be detrimental to health, namely the buildup of cholesterol in the body above normal values (Ganong, 2018).

Fat, also known as cholesterol, is a complex fat compound consisting of 80% from the inside (liver) and the remaining 20% from the outside (nutrition). Cholesterol does not dissolve in blood fluid, so to be transported throughout the body it must be packaged with protein into particles called lipoproteins. Lipoproteins can be considered as "carriers" of cholesterol in the blood. Total cholesterol is a composition of many substances, including triglycerides, both low and high-density cholesterol (Density-lipoprotein/LDL and High-density lipoprotein (HDL) (Yusrita et al., 2022).

High cholesterol levels in the blood can cause narrowing and hardening of the blood vessels with plaque, known as atherosclerosis. The initial process of cholesterol accumulation begins with increased blood pressure (hypertension), causing atherosclerosis and leading to stroke and other heart diseases. The prevalence of stroke in Indonesia in 2018 was 10.9% of the population over the age of 15 years who had suffered a stroke (Ministry of Health RI, 2018). Several risk factors that influence blood cholesterol levels are heredity, age, gender, smoking, alcohol consumption, low intake of vegetables and fruit, obesity, diabetes, stress, and excessive coffee consumption (Diarti et al., 2016).

Public infrastructure and facilities officers (PPSU) or Orange Troops are human resources owned by the DKI Jakarta cleaning service to achieve the goal of creating a better Jakarta, especially in terms of cleanliness. PSU officers have to often be outside so they may have a bad lifestyle because they are in an environment where it is easy to get food. Based on the questionnaire that was distributed to Rawa Buaya Village PSU officers, the results of the questionnaire showed that they often smoke, consume coffee, and eat foods that contain fat or oil. They also rarely carry out cholesterol screening as a preliminary examination to determine their cholesterol levels.

Determination of cholesterol levels is carried out qualitatively using the POCT (Point-Of-Care-Testing) examination method. This method is usually used to carry out initial checks on levels of certain compounds that can cause disease in the community. One of the health checks that can use the POCT method is checking total cholesterol levels. The POCT method is widely used for the following reasons: the price of the examination is more affordable, easy to procurement of instruments, practical to use of the instruments, only

requires a small blood specimen (whole blood), and the results are known relatively quickly, and the use of the instruments can be done independently (Pertwi, 2016). In research conducted by Haipei & Aryani (2022) and Atika & Aryani (2022), the results showed that there was no difference between the results of examinations using POCT and Photometer in determining cholesterol levels.

Based on the background of the problem above, the author is interested in researching "Analysis of Total Cholesterol Levels in Infrastructure and Public Facilities Officers in Rawa Buaya Subdistrict" which aims to determine the distribution of total cholesterol levels in PSU officers in Rawa Buaya subdistrict. This research has never been conducted before, so researchers are interested in conducting this research.

2. Materials and Methods

2.1. Materials

This research is a descriptive-analytical study with a cross-sectional study method. The research was conducted from March to June 2023 in the Rawa Buaya Village environment, West Jakarta. The research sample obtained was 67 respondents who were selected based on purposive sampling techniques with inclusion and exclusion criteria. Inclusion criteria are PPSU who consume fatty foods, workers who regularly consume coffee, smoke, and are willing to be respondents. Exclusion criteria are: PPSU who do not consume fatty foods, do not consume coffee every day, do not smoke, respondents who are sick and are not willing to be respondents. This research has passed the ethical test regarding the implementation of research in the health sector Number: 157/B/ETIK/III/2023.

2.2. Methods

This examination was carried out by researchers by visiting the Rawa crocodile sub-district and meeting with PSU officers after they finished work. Officers and respondents washed their hands before the research. Respondents are required to use personal protective equipment (PPE), and at least a medical mask. The examination procedure is carried out in 3 stages, namely: pre-analytical, analytical, and post-analytical stages. Starting from patient identification, preparation of tools and materials, taking capillary blood, checking total cholesterol levels, and reading, recording, and analyzing the results of checking total cholesterol levels.

Data analysis in this study is in the form of a table containing the percentage of respondents based on age, gender, and total cholesterol levels of the respondents. Data is calculated based on the following formula to get the percentage:

$$\text{Percentage (\%)} = \frac{\text{Respondent per variabel(N)}}{\text{Respondent total}} \times 100\% \dots\dots\dots (1)$$

3. Results and Discussion

3.1. Results

The research was conducted to analyze total cholesterol levels using the Point of Care Testing (POCT) method from March to June 2023 in Rawa Buaya Village involving 67 PPSU officers as research subjects using a purposive sampling technique which was included in the inclusion criteria and exclusion criteria., with results as in Table 1.

Table 1. Distribution of respondents based on age

Age (Year)	Respondent (N)	Percentage (%)
21-30	18	26,9
31-40	24	35,8
41-50	17	25,4
51-60	8	11,9
Total	67	100

The distribution of respondents based on Table 1 shows that the dominant ages are the productive ages, namely 31-40 years totaling 24 people (35.8%), 21-30 years totaling 18 people (26.9%), 41-50 years old totaling 17 people (25.4%) and non-productive age, namely 51-60 years old, amounted to 8 people (11.9%).

Table 2. Distribution of respondents based on gender

Gender	Respondent (N)	Percentage (%)
Male	65	97
Female	2	3
Total	67	100

The distribution of respondents based on Table 2 shows that the most common gender is male respondents with 65 people (97%) and women with 2 people (3%). Likewise, based on Table 3, the overall average cholesterol level of respondents is 201 mg/dL, but if

grouped by gender, the level for women is higher, namely 237 mg/dL, and the cholesterol level for men is 200 mg/dL.

Table 3. Average total cholesterol levels of respondents

	Total Cholestrol Level (mg/dL)
Average	201
Male	200
Female	237

The results of the respondent's questionnaire in Table 4 which asked whether they had a history of hypertension showed that all respondents (100%) did not have a history of hypertension.

Table 4. Results of respondents hypertension history questionnaire

Respondent	Hypertension Patient History			
	Yes		No	
	N	%	N	%
Average	0	0	67	100

3.2. Discussions

Based on Table 1, it can be seen that the distribution of respondents based on age is mostly in the 31-40 year range, namely 24 people (35.8%). This can be said of respondents who are of productive age. PSU officers have a heavy workload, such as working outdoors, sweeping roads, and cleaning parks, so workers who have strong physical abilities are needed. Research conducted by Kusgiyanto et al (2017) states that there is a relationship between age and the level of work fatigue. The influence of age on work fatigue occurs because the body's physiological functions can change. After all, age factors affect a person's body's endurance and work capacity. Someone young can do heavy work and conversely, if someone is older, their ability to do heavy work will decrease because they feel tired quickly and do not move nimbly when carrying out their duties, thus affecting their performance (Suma'mur, 2014). According to Suyono & Hermawan (2013), if the age of the workforce is in the productive category, their work productivity will increase. This is because, at the productive age level, the workforce has high creativity in their work. After all, it is supported by greater knowledge and insight and has high responsibility for

the tasks given.

Based on Table 2, it can be seen that the number of respondents based on gender was 65 men with a percentage of 97%. So from these results it was determined that the majority of respondents were male, it can be seen that male workers are needed in large numbers because the duties of a PPSU are quite heavy. PPSU officers not only handle cleanliness issues, but they also handle parks, roads, and waterways. Research conducted by Kusgiyanto et al (2017) states that there is no relationship between gender and the level of work fatigue. The absence of a relationship means that many factors influence fatigue and gender is not a factor that is directly related to fatigue. However, recruitment of PPSU members is also open to women such as housewives and single women. Female workers are usually assigned to cleanliness, such as sweeping the streets and tidying up leaves that litter the roads. Meanwhile, parts of the work such as cleaning water channels and alert patrols are handed over to men.

Based on Table 3, the average total cholesterol level of respondents, namely 201 mg/dl, is in the threshold category. Overall, the habits of the respondents support an increase in cholesterol levels. The increase in total cholesterol levels becomes more rapid at a young age which can be caused by unhealthy lifestyles, such as smoking, genetics, and diet. From these results, it is still within the limits but it is clear that there are differences in the results for each age, the older a person gets, the more the body's metabolic system decreases, which causes the body's ability to process cholesterol fat into something useful for the body to be less than optimal and cholesterol will accumulate in the bloodstream. Based on research conducted by Saputri and Novitasari (2021), cholesterol levels will increase as the respondent ages.

When comparing total cholesterol levels between men and women, the results of this study show that women have a higher average than men. The research is also in line with Ujii (2015) who stated that there is no significant relationship between gender and cholesterol levels. The same research was also conducted by Kurniawan et al (2019) who stated that there was no relationship between gender and obesity and total cholesterol levels. This is not in line with the theory which states that men experience a decrease in cholesterol levels during adolescence. The decrease in cholesterol levels is caused by the testosterone hormone which increases during adolescence. Men over 20 years old have higher cholesterol levels than women. However, after menopause, women experience

higher cholesterol levels than men. The cause is a decrease in the hormone estrogen after women's menopause (Ujjani, 2015). It can be said that the theory is not in line with the field because many other factors influence total cholesterol levels.

Based on Table 4 regarding the history of hypertension, research respondents did not have a history of hypertension (100%). When a person has high total cholesterol levels, it can cause cholesterol to accumulate in the walls of blood vessels, causing high blood pressure, and leading to hypertension. Research conducted by Hasliani, et al (2017) states that there is a relationship between cholesterol levels and the incidence of hypertension in sufferers of chronic kidney disease at RSUD Dr. Moewardi. From the total cholesterol results of the research respondents, not all of them had high total cholesterol. This is also supported by the age factor of research respondents who are still in productive age or not yet elderly. This accumulation of total cholesterol does not happen quickly, but gradually over time so that the incidence of hypertension can only be felt in old age. Therefore, control of total cholesterol levels must be carried out from the productive age so that there is no possibility of hypertension in old age. The worst possibility of hypertension is having a stroke due to a rupture of blood vessels in the brain. Research conducted by Syah, et al (2020) states that strokes can be caused by hypertension and increased total cholesterol levels in the blood.

4. Conclusions

Based on the research conducted, the research results can be concluded that the dominant distribution of respondents based on age is the productive age group, namely 31-40 years, amounting to 24 people (35.8%). The distribution of respondents based on gender was mostly 65 male respondents (97%) and 2 female respondents (3%). The overall average cholesterol level of respondents was 201 mg/dL, but if grouped by gender, the level for women was higher, namely 237 mg/dL, and the cholesterol level for men was 200 mg/dL.

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Author Contributions: MDC, AMH: designed the research; MDC: performed the laboratory work; MDC, AMH: analyzed the data.

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