THE RELATIONSHIP OF THE LEVEL OF NUTRITIONAL KNOWLEDGELEVELSAND FAT INTAKE TO CHOLESTEROL LEVELS IN PT EMPLOYEES BOLAANG MONGONDOW DISTRICT TOURISM MANAGEMENT

ABSTRACT

Background

The development of companies in Indonesia is increasingly rapid as time goes by. In every company, it is important for them to prioritize the health of their workforce so that work productivity is maintained. In Indonesia, cholesterol sufferers can be said to be quite high, reaching 28%. What is even more surprising is that 7.9% of people in the world die from this disease.

Objective

The aim of this research was to determine the relationship between the level of nutritional knowledge and cholesterol levels and fat intake among employees of PT Tata Wisata JRBM Bakan, Bolaang Mongondow Regency.

Study design.

This type of research is analytical with a cross sectional approach

Place and duration of study

The research was conducted at PT. Bakan Village Tourism Arrangement, Bolaang Mongondow Regency in November 2023.

Method(s)

The population in this study were all employees of PT. Tata Wisata – JRBM Bakan Regency. Bolaang Mongondow aged 20-49 years, a total of 49 people. The samples in this study were 33 samples which were determined using the Slovin formula.Data collection was obtained from measuring cholesterol levels, fat intake using a 24-hour food recall form and nutritional knowledge by giving questionnaires to the sample.

Results

The results of research and data analysis of a large sample with high category nutritional knowledge were 20 samples (60.6%). The fat intake of most samples was in the category above requirements for 18 samples (33%). Most of the cholesterol levels were at the threshold of high cholesterol levels in 14 samples (42.4%) and high cholesterol in 4 samples (12.1%). There is no relationship between nutritional knowledge and fat intake with a p value of (0.629). There is a relationship between fat intake and cholesterol levels with a p value (0.000). There is no relationship between nutritional knowledge and cholesterol levels with a p value of (0.882).

From this research it can be concluded that of the 3 variables tested, namely nutritional knowledge, cholesterol levels and fat intake, only fat intake and cholesterol levels have a relationship.

Keywords: Fat intake, food recall, cholesterol levels

INTRODUCTION

The development of companies in Indonesia is increasingly rapid as time goes by. All companies demand to get the best results in their respective fields in order to help encourage economic growth in Indonesia. Economic growth in each company requires one of them to have healthy, productive and high-quality workforce resources. Employees are a very important resource because they are the main asset that functions as a company driver. Therefore, it is important for every company to prioritize the health of its workforce so that work productivity is maintained.

PT. Tata Wisata (TW) was founded and established in 1974 with superior performance for more than 3 decades, and has become one of the largest national long-distance catering and

equipment service companies in Indonesia. PT. TataWisata (TW) not only focuses on food production services but also on supply camp maintenance services and food logistics supplies for mining, oil and gas sectors throughout Indonesia. PT. Tata Wisata (TW) is one of the industrial sub contractors that helps Indonesia in the economic sector operating at PT. JResoursces Bolaang Mongondow (JRBM) Bakan Village, Bolaang Mongondow Regency, North Sulawesi Province since 2021.

One of the factors that can influence work productivity is nutritional status. According to[1]Supriasa (2016), it is important for adults to have good nutritional status. If someone has more or less nutritional status, it can pose a risk of various diseases. In other research, it was stated that there is a relationship between nutritional status and work productivity, meaning that workers with abnormal nutritional status have a greater risk of experiencing a decrease in work productivity than workers with normal nutritional status.

Food consumption needs influence a person's nutritional status. Nutritional status is a health condition related to the use of food by the body. There are two factors that influence nutritional status, namely direct factors and indirect factors. Direct factors include intake of various foods and disease. Meanwhile, indirect factors include the economy, education, family, food production, environmental cleanliness and health service facilities. Nutritional status is differentiated between poor, less, good and more nutritional status. The nutritional status of society is usually described by the nutritional problems experienced by nutritionally vulnerable groups of people, one of which is workers[2].

According to Riskesdas 2018, Indonesian people with the behavior of consuming typical foods, high in cholesterol and fried foods ≥1 time per day is 40.70%, increasing from year to year by 12.8%. The proportion of the population aged > 15 years who have high cholesterol levels is higher in women (39.6%) while in men (30%) and in urban areas it is greater than in rural areas.

In Indonesia, cholesterol sufferers can be said to be quite high, reaching 28%. Even more surprising, it turns out that 7.9% of people in the world die from this disease. If treated too late, high cholesterol will indeed endanger health, and can even cause death (Ministry of Health, 2018).

Results of a preliminary survey conducted by researchers in early 2023, interviews conducted at PT. Tata Wisata There are many food menu variants whose processing is fried. So that employees in mining, especially in the food services department, have a history of Medical Check Up (MCU) results, especially Cholesterol test results above normal levels.

Based on the background description, it is known that if the nutritional knowledge of PT employees. Low tourism regulations can result in mistakes in choosing food and have an impact on workers' cholesterol levels and fat intake. Seeing this, researchers were interested in conducting research on the relationship between nutritional knowledge and cholesterol and fatty acid levels in PT employees. Bakan Tourism Management, Bolaang Mongondow Regency.

The aim is to determine the relationship between the level of nutritional knowledge and fat intake on cholesterol levels in employees of PT Tata Wisata Bakan, Bolaang Mongondow Regency.

METHOD

The type of research used is analytical research with a cross sectional approach, because the variables of fat intake, nutritional knowledge and cholesterol levels are measured at the same time. The research was conducted at PT. Bakan Village Tourism Arrangement, Bolaang Mongondow Regency in November 2023.

The population in this study were all employees of PT. Tata Wisata – JRBM Bakan Regency. Bolaang Mongondow aged 20-49 years, a total of 49 people. The sample in this study was 33 samples determined using the Slovin formula while the sampling technique was simple random sampling.

Data collection was obtained from measuring cholesterol levels, fat intake using a 24-hour food recall form and nutritional knowledge by giving questionnaires to the sample.

Data analysis includes Univariate analysis and Bivariate Test which is preceded by a normality test then carried out by the Pearson Product Moment test.

RESULTS

The distribution of samples based on age in this study can be seen in table 1 below:

Table 1. Sample Distribution Based on Age

NO	**Age**	n	%
1	21-29 years old	6	18
2	30-39 years old	16	48
3	40-49 years old	11	33
	Amount	33	100
	Gender		
1	Woman	9	27
2	Man	24	73
	Amount	33	100

Based on the research results, it is known that some of the samples were aged 30-39 years (48%). With a minimum age of 23 years and a maximum age of 49 years. Meanwhile, gender in this study shows that the majority of the sample is male, 24 people (73%).

The distribution of nutritional knowledge scores in this study can be seen in table 2 below:

Table 2. Sample Distribution Based on Nutrition Knowledge

NO	Nutrition Knowledge	n	%
1	Low (<55)	1	3
2	Sendang (56-75)	12	36.4
3	High (76-100)	20	60.6
	Amount	33	100

Based on table 2 above, most of the samples had nutritional knowledge in the high category, 20 samples (60.6%).

Table 3. Sample Distribution Based on Cholesterol Levels

NO	Cholesterol Levels	n	%
1	Optimal (<200 mgdl)	15	45.5
2	*The limit is high*(200-239mg/dl)	14	42.4
3	High (≥ 240 mg/dl)	4	12.1
	Amount	33	100

Based on the sample, it is known in table 3 above the distribution of cholesterol levels that the majority of samples have optimal cholesterol levels, 15 samples (45.5%) and high cholesterol levels, 4 samples (12.1%).

In this study, fat intake was obtained by means of non-consecutive 2x24 hour food recall interviews taken on research days 1 and 3 and the results were compared with the Indonesian Nutritional Adequacy Rate (AKG). The distribution of fat intake in this study can be seen in table 4 below:

Table 4. Sample Distribution Based on Fat Intake

No	Categories of Fat Intake	n	%
1	Moderate Deficit (70-79% RDA)	3	9.1
2	Mild Level Deficit (80-89% RDA)	8	24.2
3	Usual (90-119% RDA)	4	12.1
4	Above Needs (> 119% RDA)	18	54.6
	Amount	33	100

Based on table 4, it is known that the fat intake of some samples exceeded the requirements of 18 samples (54.6%).

1. Relationship between Nutritional Knowledge and Fat Intake

This research used a nutritional knowledge questionnaire and a 2x24 hour food recall form. The results of the research on the relationship between fat intake and cholesterol levels in PT Tata Wisata employees can be seen in table 5 below:

Table 5. Test Results of the Relationship between Nutritional Knowledge and Fat Intake

Variable	n	R	P
Nutrition Knowledge Fat intake (g)	33	0.087	0.629

Based on the Pearson Product Moment relationship test in table 6 above, a sig value of 0.629 was obtained, which shows that there is no significant relationship between nutritional knowledge and fat intake, the direction of the correlation is positive with the strength of the correlation being very weak (r = 0.087).

2. Relationship between fat intake and cholesterol levels

This research uses a 2x24 hour food recall form and checks cholesterol levels. The results of research on the relationship between fat intake and cholesterol levels in PT Tata Wisata employees can be seen in table 6 below:

Table 6. Test Results of the Relationship between Fat Intake and Cholesterol Levels

Variable	n	R	P
Fat intake (g) Cholesterol level (mg/dl)	33	0.806	0,000

Based on the results of the Pearson Product Moment relationship test in table 7 above, a sig value of 0.000 was obtained, which indicates that there is a significant relationship between fat intake and cholesterol levels, with a positive correlation and very strong correlation strength (r = 0.0806).

3. Relationship between Nutritional Knowledge and Cholesterol Levels

This study used a nutritional knowledge questionnaire and cholesterol level examination. The results of research on the relationship between nutritional knowledge and cholesterol levels can be seen in table 7 below:

Table 7. Test Results of the Relationship between Nutritional Knowledge and Cholesterol Levels

Variable	n	R	P
Nutrition Knowledge Cholesterol level (mg/dl)	33	0.027	0.882

Based on the Pearson Product Moment relationship test in table 7 above, a sig value of 0.882 was obtained which shows that there is no significant relationship between nutritional knowledge and cholesterol levels, the direction of the correlation is positive with the strength of the correlation being very weak (r = 0.027)

DISCUSSION

The sample in this study was PT. Tata Wisata employees with an average age of 30 years (48%) who were at PT. Tata Wisata Bakan Village, totaling 33 samples who met the inclusion and exclusion criteria. According to Soetardjo (2019),As a person ages, activity decreases, lean body mass decreases, while fat tissue increases. These changes are because the activity of several hormones that regulate metabolism decreases with age. As the respondent gets older/older, the total cholesterol level increases/higher.

According to Utami (2017), all ages have the same risk of increasing cholesterol levels. Diet and lifestyle are factors involved in stimulating an increase or decrease in cholesterol levels, so it can be concluded that hypercholesterolemia is a risk factor that can be controlled.[3].

The sample in this study was mostly male, 24 people (73%). In theory, gender factors influence blood cholesterol levels. In childhood, women have higher cholesterol values than men. Men show a significant decrease in cholesterol during adolescence, due to the influence of the

hormone testosterone which increases during that time. Adult men over 20 years generally have higher cholesterol levels than women. After women reach menopause, they have higher cholesterol levels than men.

Theoretically, it shows that men aged 18-59 years have a higher risk of abnormal total cholesterol levels than women, but in this study it was found that women have a greater risk than men. This is thought to be related to the larger number of female respondents compared to men. The relationship between gender and total cholesterol levels varies in several studies. On research[4]found that total cholesterol levels in women were higher than in men, this is in line with this research. Meanwhile in research[5]found that gender did not have a significant relationship with total cholesterol. It was explained that in samples aged over 61 years, if visceral fat was found, this indicated an increase in total cholesterol levels. This study found a tendency that female gender has a relationship with central obesity, the results show that the prevalence of central obesity is greater in women (55.1%) than in men (15.8%) so that the proportion of total cholesterol levels is abnormal also increased in women. However, research[6]found a significant difference between the average total cholesterol in men and women, found to be higher in men aged 18-45 years compared to women of the same age in Pakistan

In this study, results were obtained showing that women suffer more from cholesterol (58%) compared to men (42%). This is because sexual hormones such as estrogen and testosterone play an important role in the regulation of lipid (fat) metabolism in the body. The hormone estrogen, which is more dominant in women, has a protective effect against increasing cholesterol levels. So it can reduce LDL cholesterol levels (bad cholesterol) and increase HDL cholesterol levels (good cholesterol). In contrast, testosterone in men may influence lipid metabolism in a different way[7]. In general, women have higher levels of the hormone estrogen before menopause. Estrogen is believed to have a protective effect against the formation of cholesterol plaque on artery walls. With reduced estrogen after menopause, women tend to become more susceptible to increased cholesterol levels and the risk of high cholesterol disease. In addition, lifestyle factors such as unhealthy eating patterns, lack of physical activity, and smoking habits can also contribute to the risk of cholesterol disease. This combination of biological and lifestyle factors may explain why women tend to have a higher risk of high cholesterol than men in some situations.[8].

a. Nutrition Knowledge

Nutritional knowledge includes knowledge about selecting and consuming daily food properly and providing all the nutrients needed for normal body function. Most of the nutritional knowledge of PT. Tata Wisata employees in this study showed high results for 20 samples (60.6%). The average value of employee nutritional knowledge is 77.7%.

The research results show that a person's level of nutritional knowledge will increase awareness of the type of food they will consume. One factor that can influence a person in choosing food in terms of quality and quantity is knowledge. This may also be related to socio-economic status and lack of information or knowledge regarding certain nutrients[9].

b. Cholesterol Levels

Cholesterol is an essential structural component that forms cell membranes and the external layer of plasma lipoproteins. Cholesterol can be in the form of free cholesterol or combined with long chain fatty acids as cholesterol esters. Cholesterol esters are a storage form of cholesterol found in most body tissues. Cholesterol also has an important meaning because it is a precursor of a large number of steroid compounds, such as corticosteroids, sex hormones, bile acids, and vitamin D.[10].

The research results showed that the average cholesterol level was 206.8 mg/dl. Based on the characteristics of cholesterol levels, most of the research samples fell into the normal category, namely 15 samples (45.5%) and the high limit category, namely 14 samples (42.4%).

c. Fat Intake

According to the AKG, fat intake for men aged 19-49 years is around 73-91 grams per day, while for women aged 19-49 years it is around 60-75 grams per day. In this sample it is known that the average fat intake of 33 is classified as above the requirements of 18 samples (33%). Average fat intake is 109 gr. Based on these results, it can be concluded that the majority of employees' fat intake exceeds the RDA.

One of the causes of increasing blood cholesterol levels is the pattern of consuming foods that contain fat. In the General Guidelines for Balanced Nutrition (Ministry of Health, 2019) it is stated that normal fat intake is between 20-25% of total energy.

Iskandar (2017) in his research stated that excessive fat consumption has a significant impact on the risk of coronary heart disease[11]. Apart from that, the research results are also supported by[12], which concluded that there is an effect of consuming foods high in saturated fat on increasing cholesterol levels in the blood which can cause blockage of the heart's blood vessels. Al Rahmad et al (2020), also reported that there is relevance of consuming foods high in fat content to increasing lipid profile levels in the blood, and excessive consumption can increase obesity, thereby increasing the risk of death.[13].

A high lipid profile in the blood, which includes total cholesterol, LDL cholesterol and triglycerides, certainly has a negative impact on a person's health. This can occur due to an imbalance in fat intake between needs and sufficiency[12]. Therefore, fat consumption should be limited to around 20-25% of total energy[14]. According to[15], one of the factors causing CHD is a person's consumption intake which contains a lot of fat. The fat consumed contains a lot of cholesterol and triglycerides, which are components of fat levels in the blood that can cause coronary heart disease

d. Relationship between Nutritional Knowledge and Fat Intake

The results of the research show that there is no relationship between nutritional knowledge and fat intake in PT. Tata Wisata employees with a sig value of 0.629, which indicates that the correlation between nutritional knowledge and fat intake is not significant between the two variables tested. The Pearson correlation value of 0.087 indicates a negative correlation with very weak correlation strength.

Nutritional knowledge influences a person's consumption patterns, where if a person's knowledge about nutrition is high, then awareness of the importance of eating nutritious food will also increase so that nutritional needs will be met. If a person's knowledge is lacking about nutrition, then the efforts made to maintain the balance of food consumed and what is needed will decrease and trigger problems of undernutrition or overnutrition.[16].

The results of the research show that there is no relationship between nutritional knowledge and fat intake in employees. This is the same as research conducted by[17], showed that there was no relationship between nutritional knowledge and fat intake in junior high school adolescents. Respondents with good nutritional knowledge had a fat intake that was more than 66.7% greater than respondents with poor knowledge in junior high school adolescents.

Lack of knowledge can also influence a person's behavior in building a healthy lifestyle. So good nutritional knowledge is needed regarding balanced nutritional consumption patterns, such as adequate intake of vegetables and fruit, consuming balanced nutritious food according to the contents of my plate, limiting sugar, salt and fat, and ensuring that side dishes are cooked well.[18]

e. Relationship between fat intake and cholesterol levels

The results of the research show that there is a relationship between fat intake and cholesterol levels in employees with a sig value of 0.000, which indicates that the correlation between fat intake and cholesterol levels is significant between the two variables tested. The Pearson correlation value of 0.806 indicates a positive correlation with a very significant correlation strength.

Consuming unsaturated fats can actually reduce the risk of metabolic syndrome by increasing HDL cholesterol levels and reducing total cholesterol levels or cholesterol deposits in the vessels, thereby preventing atherosclerosis and coronary heart disease.[19].An increase in the cholesterol/HDL level ratio is a risk factor in the formation of coronary heart disease. The relationship between blood cholesterol levels and consumption of fat as an energy source shows an increase, because fat provides added value to cholesterol levels. The higher the fat consumed but the unbalanced use of energy will cause increased blood cholesterol levels[20]. Research in Tehrani states that high fat intake has a significant relationship with an increase in metabolic syndrome[21]. Other research has found a relationship between high consumption of meat and fried foods as a parameter for the occurrence of metabolic syndrome[22]. In populations in Japan and Brazil, a relationship was also found between high fat intake and the incidence of metabolic syndrome[23]. Food factors that influence blood cholesterol levels are total fat, saturated fat and total energy. The main sources of saturated fat are meat fat and milk fat found in products such as milk, cream, butter, cheese, ice cream, margarine, egg yolks, and plant oils (coconut oil, palm oil, peanut oil, peanut oil). soybeans, etc.)[24]. Research by Adachi et al in 2011 showed that there was a tendency or trend of increasing blood cholesterol levels along with a trend or trend of increasing protein and fat intake in Japan for 50 years.[25]. Research in

Tehran shows that people who follow a healthy diet such as consuming vegetables, nuts and fruit have a lower risk of metabolic syndrome.[19].

f. Relationship between Nutritional Knowledge and Cholesterol Levels

The results of the research show that there is no relationship between nutritional knowledge and cholesterol levels in PT. Tata Wisata employees with a sig value of 0.882, which indicates that the correlation between nutritional knowledge and cholesterol levels is not significant between the two variables tested. The Pearson correlation value of 0.027 indicates a negative correlation with very weak correlation strength.

ResultsFrom research it is known that there is no relationship between nutritional knowledge and cholesterol levels in employees. This is the same as research conducted by Sunarti et al (2015), showing that there was no relationship between nutritional knowledge and the total cholesterol profile of employees at the Cicendo Eye Hospital in Bandung. Respondents with good nutritional knowledge had a tendency for a normal total cholesterol profile to be 1.36 times greater than respondents with poor knowledge among Cicendo Eye Hospital Bandung employees.

CONCLUSION

The conclusion of our research underlines the knowledge of the good nutrition category and fat intake above the nutritional adequacy rate requirements, while cholesterol levels are mostly within normal limits. There is a relationship between fat intake and cholesterol levels, while there is no relationship between knowledge and fat intake and cholesterol levels.

ETHICAL APPROVAL

This research has received approval from the Health Polytechnic Ethics Commission of the Ministry of Health Manado Number: KEPK /01/ 03/003/2024. March 06, 2024

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