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Relationship Between Nutrition Knowledge and Application of the 4 Pillars of Balanced Nutrition in Employees at PT Multi Kusuma Cemerlang, Samarinda City

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ABSTRACT

A person's level of knowledge influences the application of the four pillars of balanced nutrition. Someone with good nutritional knowledge can easily apply the four pillars of balanced nutrition. A worker with the good nutritional condition will have optimal work quality and better body resistance. This study aims to determine the Relationship between nutritional knowledge and applying the four pillars of balanced nutrition to workers at PT Multi Kusuma Cemerlang in the Palaran working area, Samarinda City. This study uses an analytical observation design with a cross-sectional design. This research was conducted at PT. Multi Kusuma Brilliant. The sample in this study was 54 people who were taken by purposive random sampling. Data were obtained using a questionnaire and tested with fisher's statistical test. The results showed no significant relationship between nutritional knowledge and the application of the four pillars of balanced nutrition; the p-value was 1.000 (p>0.05). There is no significant relationship between nutritional knowledge and applying the four pillars of balanced nutrition to workers at PT. Brilliant Multi Kusuma.

Keywords: nutrition knowledge, application of the four pillars of balanced nutrition.

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INTRODUCTION

Nutrition problems in Indonesia seem endless. Indonesia has a new problem, namely the prevalence rate of obesity which also continues to increase. This makes Indonesia have the problem of undernutrition and overnutrition at the same time or what is called the double burden of malnutrition or the double burden of wrong nutrition. This double burden of malnutrition can occur at the individual, household, and population levels throughout the human life cycle (Hermiyanty, Fitrasyah, Aiman, & Ashari, 2018).

The problem of deficiency and excess nutrition a problem that occurs because the application of balanced nutrition is still deficient. This is due to the high prevalence of obesity (Restrepo, 2022). The hallmark of a developed nation is a nation that has a high level of health, intelligence, and work productivity. Nutritional conditions influence these three things. Diet is the most important behaviour that can affect nutritional status (Marchello et al., 2021). This is because the quantity and quality of food and drink consumed will affect nutritional intake, affecting the health of individuals and society. Optimal nutrition is essential for the average growth, physical development, and intelligence of infants, children, and all age groups (Jain, Maheshwari, & Jain, 2022). Good nutrition makes the body weight normal or healthy, the body is not susceptible to infectious diseases, increases work productivity and is protected from chronic diseases and premature death (Huang, Dong, Xu, Cao, & Sun, 2023). In order to keep the body healthy and avoid various chronic diseases or non-communicable diseases related to nutrition, people's diet needs to be improved towards balanced nutrition consumption. Good nutritional conditions can improve individual and community health.

The prevalence of obesity in Indonesia mainly occurs in adults, as evidenced by the high Riskesdas data. The data tends to increase from year to year. In 2007 the obesity data was 10.5%. In 2013 it increased to 14.8%, and then in 2018, it rose to 21.8%.

Several causes influence the occurrence of undernutrition and overnutrition in the community, including socioeconomic status, lack of knowledge, ignorance of mothers about providing good nutrition for children and Low Birth Weight (LBW) (Wahyudi, Sriyono, & Indarwati, 2014).

Factors that directly cause nutritional problems, both excess nutrition and undernutrition, are imbalances between food intake and body needs and the presence of infectious diseases. Malnutrition is caused by nutritional intake below the recommended adequacy. In contrast, excess nutrition is caused by nutritional intake exceeding the recommended adequacy and not being matched by sufficient physical activity (Pratami, Widajanti, & Aruben, 2016).

Nutritional problems in East Kalimantan are vulnerable to poverty and family parenting patterns including food, health, hygiene, and play. The research on low-income families in East Kalimantan showed that the percentage of malnutrition was 5.8%, malnutrition was 10.8%, good nutrition was 78.3% and excess nutrition was 2.5%. This indication shows that the human development index (IPM) still leaves a complex problem that must be addressed in future development by the provincial government of East Kalimantan (Saragih, 2010).

Cognitive knowledge is a critical factor in the formation of one's actions. The knowledge based on proper understanding will foster the expected behaviour, especially about nutritional knowledge. Knowledge of nutrition is one's understanding of nutrition, nutrition, and the interaction between nutrients on nutritional status and health. If there is a lack of nutrition knowledge, the efforts made by adolescents to maintain a balance between the food consumed and what is needed will decrease and cause problems with undernutrition or overnutrition (Roaring, Posangi, & Manampiring, 2020).

Knowledge of nutrition and obesity is related where the lower the knowledge about nutrition, the higher the risk of obesity. This is per the research by Jaminah and (Adibah, Patriasih, & Nurhayati, n.d.), which stated that the results of their research were that the nutritional status of obesity was 75.40% and the most nutritional knowledge was in the less category (90%). This shows a relationship between nutrition knowledge and the incidence of obesity in female employees at the Nutrition Installation of RSUD Dr Soetomo (Mardiana, 2020).

Research by Nurdzulqaidah in 2017 reported a significant relationship between knowledge about Balanced Nutrition and Nutritional Status. The P value indicates this: $0.003<\sigma(0.05)$ (Nurdzulqaidah, Pradananta, & Yuniarti, 2017).

Health and labour are inseparable units, one of which is the fulfilment of work nutrition following each worker's nutritional status and workload to achieve and increase work efficiency and productivity (Ramadhanti, 2020).

Nutritional status is one of the critical factors affecting work productivity. Nutritional status and good health conditions will significantly affect physical fitness and good thinking power in doing work. Workers supported by good nutritional status will work more actively, productively, and conscientiously. Meanwhile, workers with poor nutritional status have poor physical abilities, lack motivation and enthusiasm, and are also sluggish and apathetic, ultimately reducing work productivity. According to research by (Tri Astuti, 2007) on work productivity, the results (44.1%) of female workers were unproductive at work.

Meanwhile, another study conducted by Novitasari (2005) showed that (80.9%) of female workers were less productive. The Relationship between nutritional status and work productivity is closely related. Workers with good nutritional status will have better work capacity and endurance (Utami, 2014).

PT Multi Kusuma Cemerlang is a company that produces rubber crumbs and was established in 2017. The total number of employees is 216 people. The products of this company are exported to various countries. This requires companies to have healthy and productive workers to produce high-quality products following the company's goals. Workers in the open area require high concentration to

prevent work accidents, leading to the optimal work quality. This requires workers to have excellent health conditions and good nutritional status. The four pillars of balanced nutrition are necessary to achieve good nutritional status. The four pillars of balanced nutrition are applied to one's nutritional knowledge level. The results of the preliminary study that the researchers conducted at PT Multi Kusuma Cemerlang found that the company provided a special canteen for employees who provided staple foods and snacks such as fruits, cakes, and so on. The food supply system at PT Multi Kusuma Cemerlang is a buffet. Then the canteen keeper must keep one portion to be used as a sample if an employee experiences food poisoning. Which food will be tested in the laboratory to determine whether it has poison. However, during the Covid-19 pandemic, the feeding system for workers was replaced with boxed rice.

Then, the normal working hours of employees at PT Multi Kusuma Cemerlang are 7 hours. However, there are times when employees are required to work more hours, namely as much as 12 hours. During the long shift, the workers get snacks such as cakes or bread and drinks such as milk. Measure the nutritional status of workers is done once a year. However, no regulations oblige workers to participate in these activities. The results of the last measurement of nutritional status on employees get normal results of as much as 70%, then 20% and fat as much as 10%. Based on this background, researchers are interested in researching the Relationship between nutritional knowledge and implementing the four pillars of balanced nutrition for workers at PT Multi Kusuma Cemerlang in the Palaran work area, Samarinda City.

Special Purpose: a. To find out the nutritional knowledge of workers at PT Multi Kusuma Cemerlang. b. To find out the application of the four pillars of balanced nutrition to workers at PT Multi Kusuma Cemerlang. c. Analyzing the Relationship between nutritional knowledge and the application of the 4 pillars of balanced nutrition to workers at PT Multi Kusuma Cemerlang. According to the Regulation of the Minister of Health of the Republic of Indonesia, Number 41 concerning Guidelines for Balanced Nutrition which has been implemented in Indonesia since 1955, is a realization of the recommendations of the World Food Conference in Rome in 1992. These guidelines replaced the slogan "4 Healthy 5 Perfect", which had been introduced in 1952. However, they have yet to follow the development of science and technology (IPTEK) in nutrition and the problems and challenges faced. It is believed that by properly implementing the Balanced Nutrition Guidelines, all nutritional problems can be overcome. The Principle of Balanced Nutrition consists of 4 (four) Pillars which are a series of efforts to balance the outgoing nutrients and incoming nutrients by monitoring body weight regularly.

METHOD

This type of research is quantitative research, with a cross-sectional approach. Cross-sectional is a measurement scale that is carried out at one time. This study aims to determine the Relationship between nutritional knowledge and applying the four pillars of balanced nutrition to workers at PT Multi Kusuma Cemerlang in the Palaran work area, Samarinda City. The research site was conducted at PT Multi Kusuma Cemerlang, Palaran District, Samarinda City. The time of research was conducted on 09 -13 May 2022. The population in this study were workers in the production section at PT Multi Kusuma Cemerlang. The population in this study was 216. Samples were taken using a purposive sampling technique by selecting samples obtained from all samples that met the inclusion and exclusion criteria.

RESULTS AND DISCUSSION

A. RESULTS

1. Overview of Research Locations

PT. Multi Kusuma Cemerlang (MKC) is a subsidiary of PT. Royal Lestari Utama is engaged in integrated natural rubber production and strives to become a sustainable natural rubber industry leader. The company is built on the four pillars that differentiate the company, namely people, place, product and profit.

The company is equipped with modern and sophisticated technological production facilities supported by superior human resources. With a production capacity of around 54,000 tons per year, MKC can absorb up to around 260 workers, 70 per cent of whom are local.

The company is committed to consistently producing quality products to meet the needs of domestic natural rubber and export commodities. All production is ensured through a reliable quality control process and meets the Indonesian National Standard (SNI) requirements. This company acts as a producer of natural rubber products with production results, namely: tires, carpets, etc. The material used is natural rubber.

The research was conducted on May 9-May 13, 2022, at PT. Multi Kusuma Cemerlang which is located on Jalan Trikora, Mangku Jenang Village, Kec. Palaran, City of Samarinda. This research was conducted at the production work unit at PT Multi Kusuma Cemerlang. The factory rubber processing process is based on an extended range of technicalities. The total number of employees is 260, then divided into 3 (three) groups: morning shift at 07.00-15.00 WITA, afternoon shift at 15.00-23.00 WITA, and night shift at 23.00-07.00 WITA. In this study, the respondents were used as research subjects were 54 respondents.

Health checks such as nutritional status assessment, checking blood sugar, cholesterol etc., at PT. Multi Kusuma Cemerlang should be held once a year. However, during the Covid-19 pandemic, the company needed a specific time to carry out its health checks. The company does not have specific regulations requiring workers to attend health checks.

Health checks on workers at PT. The last Multi Kusuma Cemerlang was held in December 2021 by Nutrition Students of the East Kalimantan Ministry of Health Polytechnic who were conducting Field Work Practices.

2. Characteristics of Respondents

Characteristics of the workforce working in the production units at PT. Multi Kusuma Cemerlang can be seen from the following research results:

a. Distribution of Respondents by Age

Table 1. Distribution of Respondents by Age

Age	n	%
20 – 30 years	30	55,6
31 – 40 years	21	38,9
41 – 50 years	3	5,6
Total	54	100

Based on Table 1, it can be concluded that the majority of respondents, namely 30 respondents (55.6%), were aged 20-30 years, and a small portion of respondents, namely three (5.6%), were aged 41-50 years.

b. Distribution of Respondents Based on Work Period

Table 2. Distribution of Respondents Based on Years of Service

Period work	n	%
1 – 2 years	20	36,1
3 – 4 years	25	47
5 – 6 years	9	16,9
Total	54	100

Based on table 2, it can be concluded that almost half of the respondents, namely 25 people (47%), have worked for 3-4 years, and a small number of respondents, namely as many as nine people (16.9%) have worked for 5-6 years.

c. Distribution of Respondents Based on Education Level

Table 3. Distribution of Respondents Based on Education Level

Level Education	n	%
Senior High School	33	61,1
D3	9	16,7
S1	12	22,2
Total	54	100

Based on Table 3, it can be concluded that the majority of respondents, namely as many as 33 people (61.1%) had a high school education level. A small number of respondents, namely as many as nine people (16.7%), had a D3 education level.

3. Univariate analysis

Univariate analysis is carried out on each variable from the research results. Generally, it produces each variable's distribution and percentage (Yulianti, Mukaddas, & Faustine, 2014). Univariate analysis in this study includes:

a. Distribution of Respondents Based on Nutrition Knowledge Measurement of nutritional knowledge in this study was carried out using three categories, namely as follows;

Table 4. Distribution of Respondents Based on Nutrition Knowledge

Knowledge nutrition	n	%
Well	51	94.4
Enough	1	1,9
Not enough	2	3,7
Total	54	100

Based on table 4, most respondents, namely 51 people (94.4%), had good nutrition knowledge. A small proportion of respondents, one person (1.9%), had sufficient nutritional knowledge.

b. Distribution of Respondents Based on the Application of the 4 Pillars of Balanced Nutrition Measurement of the implementation of the four pillars of balanced nutrition in workers in this study was divided into several categories, namely, as follows.

Table 5. Distribution of Respondents Based on the Application of the 4 Pillars of Nutrition Balanced

Implementation of the 4 Pillars nutritionBalanced	n	%
Well	19	35,2
Enough	21	38,9
Not enough	14	25,9
Total	54	100

Based on table 5, almost half of the respondents, namely as many as 21 respondents (38.9%), have implemented the four pillars of balanced nutrition in the excellent category. A small portion of respondents, namely as many as 14 (25.9%), have implemented the four pillars of balanced nutrition in the less category.

4. Bivariate Analysis

In order to obtain valid statistical test results, the processed data must meet the test requirements, where the chi-square test conditions are that first, there are no cells with a natural frequency or also called actual count (F0) with a value of 0 (zero), the second if there is a 2x2 contingency table, you cannot find an expected frequency or Expected Count (FH) that is less than 5 in 1 cell, and finally, the form of the table is more than 2x2, be it 2x3 or more, there can be no cells with Expected Count (FH) is less than five or more than 20%, therefore to qualify for the chi-square test the researcher must combine several categories.

In the category of knowledge of nutrition and the application of the four pillars of balanced nutrition, three categories were initially changed to 2 categories, namely good (good) and less (enough, not enough). The Relationship between nutritional knowledge and the application of the four pillars of balanced nutrition is presented in the following table;

Table 6. Relationship Between Nutritional Knowledge and Application of the 4 Pillars of NutritionBalance on Workers at PT. Brilliant Multi Kusuma

Knowledgenutrition	Application 4 Nutrition Pillar Balanced				Total		
	Good		Less				
	n	%	n	%	n	%	*p- value*
Well	18	35,3	33	64,7	51	100	
Not enough	1	33,3	2	66,7	3	100	1,000
Total	19	35,2	35	64,8	54	100	

Table 6 shows that in the fantastic nutrition knowledge group, most have less implementation of the four pillars of balanced nutrition, namely as many as 33 respondents (64.7%). Whereas in the lack of knowledge of nutrition group, most of them had the application of the four pillars of poor nutrition, namely 2 respondents (66.7%).

Fisher's Statistical Test results found that p-value = 1.000 (p> 0.05). This shows that Ha is rejected and H0 is accepted, which means there is no significant relationship between the level of nutritional knowledge and the application of the four pillars of balanced nutrition.

B. Discussion

1. Univariate analysis

The univariate analysis aims to explain or describe the characteristics of each research variable. The analysis was carried out by looking at the frequency distribution of each independent (free) variable category, namely Knowledge of Nutrition, and the dependent variable (bound), namely the Implementation of the 4 Pillars of Balanced Nutrition.

a. Application of the 4 Pillars of Balanced Nutrition

Based on the study's results, it was shown that almost half of the respondents, namely 21 people (38.9%), had the implementation of the four pillars of balanced nutrition in the excellent category. A small portion of the respondents, namely as many as 14 people (25.9%), had the implementation of the four pillars of balanced nutrition in the less category.

The results of this study are in line with research conducted by (Yulianti et al., 2014) which showed that most of the respondents in the application of the four pillars of balanced nutrition had an irregular eating pattern. However, half of the respondents tried to manage a balanced diet through a balanced diet. appropriate. It can be concluded that respondents are very interested in and aware of their health, but this is only sometimes applied because it does not lead to their daily food preferences.

In implementing balanced nutrition behaviour, health behaviour is needed. Health behaviour is a person's response to a stimulus or object related to health, disease, and factors that affect health (environment, food, drink, and health services). Health behaviour is actions and habits related to health care, maintenance, and improvement that are influenced by perceptual values, motives, beliefs, and other cognitive elements (Pakpahan et al., 2021).

b. Nutrition Knowledge

Based on the results of the study, it was shown that the majority of respondents, namely 51 people (94.4%), had good nutrition knowledge. A small proportion of respondents, namely 3 people (5.6%), needed better nutrition knowledge. This is because workers often get information about health, especially nutrition, in various media, for example, social media like Instagram. Nutritional knowledge has an important role in choosing the right food and drink. This aims to support the improvement of health and is expected to do work to be more optimal.

Then the education level of almost half of the respondents had D3 and S1 education levels. According to research conducted (Dharmawati, 2016), educational factors can affect a person's level of knowledge. Which, the higher a person's level of knowledge, the easier it will be for that person to receive information.

This study's results align with the results of research conducted by (Soraya, Sukandar, & Sinaga, 2017). Where most of the subjects had adequate nutritional knowledge (74.3%). Of the 20 questions regarding nutritional knowledge submitted to the subject, quite a large percentage of the subjects answered correctly.

However, the results of this study were not in line with research (Cahyaningtyas, Soviana, Gz, & Gizi, 2018) which showed that the majority, namely 26 respondents (56%), did not have access to any nutritional information and almost half, namely 24 respondents (44 %) obtain nutritional information from various sources. Many said they got nutrition information from their children's books when they helped with homework. Most of the respondents' knowledge about nutrition is still very limited. Food myths that have been regarded as nutritional knowledge often harm their health.

Knowledge is the result of the sensing, or the result of knowing someone about the value of an object through the senses they have (eyes, nose, ears, and so on) by itself at the time of sensing to produce this knowledge is strongly influenced by the intensity of attention and perception of the object. Most of a person's knowledge is obtained through the sense of hearing (ears) and the sense of sight (eyes) (Alexander, 2018).

There are several factors that influence knowledge (Luo & Chan, 2022), namely education (education affects the learning process, the higher a person's education the easier it is for that person to receive information), mass media (technological advances will provide

various types of mass media that can influence knowledge about new information), social culture and economy (customs and traditions that people carry out without going through reasoning whether what is done is good or bad. A person's economic status will also determine the availability of a facility needed for specific purposes, so that this socioeconomic status will affect one's knowledge), environment (environment influences the process of entering knowledge into individuals who are in the environment), experience (experience as a source of knowledge is a way to obtain the truth of knowledge by repeating the knowledge obtained in solving the problems encountered).

2. **Bivariate Analysis: The Relationship Between Knowledge of Nutrition and the Implementation of the 4 Pillars of Balanced Nutrition in Workers**

The study results show that in the fantastic nutrition knowledge group, most have less implementation of the four pillars of balanced nutrition, namely as many as 33 respondents (64.7%). Meanwhile, in the less knowledge of nutrition group, most had poor nutrition, namely two respondents (66.7%).

This study's results indicate no significant relationship between nutritional knowledge and the application of the four pillars of balanced nutrition. Most respondents, namely as many as 33 people (64.7%), did not implement the four pillars of balanced nutrition feeding improvement. This is caused by several factors influencing respondents not to apply the four pillars of balanced nutrition. From the results of filling out the questionnaire on the application of the four pillars of balanced nutrition, it was found that, on average, the respondents rarely consumed a variety of foods, did not get used to clean living habits, did not carry out regular physical activity because the respondent did not have time to exercise due to busy work. The respondents did not routinely monitor their weight.

The results of this study align with research conducted by Mi Ran & Seuong-go (2015), which shows that most respondents have a good level of nutritional knowledge. This is supported by the high level of one's education. Namely, 94% of respondents have a bachelor's degree, and 5.1% have a postgraduate school degree. However, applying the four pillars of balanced nutrition shows that most respondents have irregular eating patterns. However, half of the respondents try to manage a balanced diet through a proper diet. In research conducted by Mi Ran & Seuong-go (2015), it can be concluded that respondents are very interested and aware of their health, but this is only sometimes implemented because it does not lead to their daily food preferences.

The research conducted by (Nisargapriya & Lokesha, 2017) shows that more knowledge about nutrition and consumption practices is still needed. A lack of sources of nutritional information causes this. The results of this study indicate that most of the respondents get nutritional information from their children's books when they help with homework. Most of the respondents' nutritional knowledge is still very limited. Most of the respondents did not apply the four pillars of balanced nutrition. Where respondents often consumption of fast food, which has a direct impact on overall health. This is because many of them must leave in the morning to go to work. So they use an easy way to be able to consume food.

The results of this study indicate that the majority of respondents, namely as many as 33 people (61.1%), have a high school level of education. According to the researcher's assumption, one can quickly get health information from various sources, such as social media, especially about nutrition.

This can also be supported by the theory which shows that high knowledge is not always influenced by high education, someone with low education but often obtains information about health will obtain high knowledge. Knowledge of nutrition is very influential on changes in one's

nutrition. If someone understands and knows what balanced nutrition is, it will be easy for that person to apply balanced nutrition guidelines.

Adequate and proper nutrition is the basis for a good human life and achieving welfare. Nutrition and health are two of the same point. If nutrition is insufficient, it can hinder a person's ability to reach his true potential. To maintain good health, a person must eat foods that contain good nutrition, but this needs to be addressed by workers. This can be caused by several factors including poor living conditions, low-income levels, and a person's lack of nutrition knowledge.

According to the researchers' assumptions, there is no significant relationship between nutritional knowledge and implementing the four pillars of balanced nutrition in workers, where most respondents have a good level of knowledge. Judging from the research results, respondents quickly get health information, especially nutrition, from various sources such as social media. However, most respondents needed more implementation of the four pillars of balanced nutrition. This is caused by several factors, such as respondents rarely consuming a variety of foods because the food menu they receive from companies is still less varied, respondents do not routinely carry out physical activity because respondents do not have time to exercise due to workload, and respondents do not routinely monitor weight because the respondent did not have personal scales.

CONCLUSION

Based on data obtained from the results of research regarding the Relationship between nutritional knowledge and the application of the 4 pillars of balanced nutrition to workers at PT. Multi Kusuma Cemerlang, the following conclusions can be drawn: At the level of nutrition knowledge, it can be concluded that the majority of respondents, namely 51 people (94.4%), have good nutrition knowledge, and a small proportion of respondents, namely one person (1.9%) have nutritional knowledge in the less category. In applying the four pillars of balanced nutrition, almost half of the respondents, namely 21 people (38.9%), had the application of the four pillars of balanced nutrition in the excellent category. A small portion of the respondents, namely as many as 14 people (25.9%), had the application of the four pillars of balanced nutrition in the less category. There is no significant relationship between nutritional knowledge and applying the four pillars of balanced nutrition to workers at PT. Multi Kusuma Cemerlang, with p-value = 1.000 ($p>0.05$).

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