

Analysis of energy needs and energy intake with health status of field workers at PT. A



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ABSTRACT

Introduction: Work nutrition refers to the nutrient or food substance needed by the workforce to meet their needs according to the type of work. The aim of work nutrition is to increase the work power and health of the workforce as much as possible in accordance with the person's nutritional status. The suitability of energy intake can also affect a person's productivity. Long-term energy consumption patterns can have an impact on a person's health or nutritional status. If unchecked, they can also have an impact on their activities and productivity. Therefore, the purpose of this study is to determine the energy needs and energy intake associated with health status in field workers.

Methods: This research used a quantitative approach with the type of observational research and a cross-sectional design. The population in this study was based on a total sample of workers at PT. A in the city of Samarinda, with a sample size of 41 workers.

Results: The results of this study indicate that most workers have an abnormal nutritional status. Only 29% of the 41 workers have a normal nutritional status. Then, in the comparison between energy intake and energy needs, it is known from 41 workers that only 32% of respondents have sufficient energy in accordance with what is consumed.

Conclusion: There is still a mismatch between energy intake and energy needs of the workers, and there are still many workers who have abnormal nutritional status. Therefore, it needs to be done, from socialization to supervision, such as implementing fitness at work, a healthy diet, adjusting workload, and getting enough rest.

Keywords: energy intake, energy needs, health status, occupational health.

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INTRODUCTION

The process by which organisms use food that is typically consumed to maintain life, promote organ growth and function, and produce energy is known as nutrition. It involves the digestion, absorption, transportation, storage, metabolism, and excretion of substances that are not needed. There is no single type of food that contains all the nutrients necessary to make a person live a healthy, growing, and productive life. Therefore, everyone needs to consume a variety of foods.¹ The human body requires a fixed amount of food and nutrition in accordance with nutritional adequacy standards, but these needs cannot always be met. Poor people do not get enough food and nutrition. They suffer from hunger for food and malnutrition. A person's nutritional status is a picture of what he or she has consumed over a long period of time. If the deficiency is mild,

there will be no real deficiency disease, but milder functional consequences will arise, and sometimes it is not realized that it is due to nutritional factors.²

Nutritional status is the health status produced by the balance of nutritional needs and inputs, or nutrients. It takes more than 40 types of nutrients every day to achieve balanced nutrition. If the need is greater than the input, it is called undernutrition status; if the need is balanced with the input, it is called a balanced nutritional status; and if the need is less than the input, it is called overnutrition status. Fulfilling the nutritional adequacy of workers while working is a form of application of occupational safety and health requirements as part of efforts to improve the health status of workers.³

Nutrition is one aspect of occupational health that has an important role in increasing work productivity. This needs

to be a concern for all parties, especially workplace managers, considering that workers generally spend about 8 hours a day at work. Low work productivity is thought to be due to a lack of motivation without consideration of other factors such as worker nutrition. Improvement of nutrition has a very important meaning in an effort to prevent morbidity, reduce absenteeism, and increase productivity at work.⁴

Industrial workers are those who are most vulnerable to health problems. Previous research stated that 43.3% of workers in the informal sector experienced health problems, one of which was fatigue, which could result in decreased productivity.⁵ Therefore, this study was conducted to determine the suitability of energy needs and energy intake for the health status of workers. This can provide an appropriate evaluation for regulating the work system in order to improve the

physical condition of workers and their productivity. Therefore, the performance of workers can increase, which can increase the company's targets, and all work activities in the workplace can be carried out properly.

MATERIALS AND METHODS

Study design

This study used quantitative research methods with an observational and cross-sectional design. This research was conducted at PT. A, which is one of the state-owned enterprises in the city of Samarinda, in two work area units.

Data collection

The population in this study were all field workers at PT. A. The total population is 49 workers. Sampling in this study used the total population, but because there were 8 people who could not participate in this study, the number of samples was only 41 respondents. The primary data used in this study was collected using interview techniques with questionnaires and observations.

Data analysis

The data analysis in this study used descriptive analysis and tabulation. The instrument used in this study is the nutrisurvey, which measures energy needs and energy intake.

RESULTS

Distribution Respondents Characteristics

Based on the distribution results, it is known that all respondents are male. The respondent's age range is mostly 46–55 years old (as much as 52%) and 36–45 years old (as much as 36%). Types of activity on workers, with light activities as many as 17% of respondents, moderate activities as many as 56%, and heavy activities as many as 27% of respondents (Table 1).

Distribution Health Status

In the distribution of health status, what is used is the status of body mass index or nutritional status. The results of the distribution of nutritional status showed that 13% of respondents were obese, 41% of respondents were overweight, 29% of

Table 1. Distribution of Respondents Characteristics

Characteristics	Amount	
	n	%
Gender		
Man	41	100
Woman	0	0
Age		
26-35 years old	3	7
36-45 years old	15	36
46-55 years old	21	52
>55 years old	2	5
Activity Type		
Light	7	17
Moderate	23	56
Heavy	11	27

Table 2. Distribution of Health Status

	Information	n	%
Nutritional Status	Underweight	7	17
	Normal	12	29
	Overweight	17	41
	obesity	5	13

Table 3. Comparison of Energy Intake and Energy Needs

	Information	n	%
Energy Adequacy Suitability	Deficiency energy	9	22
	Enough energy	13	32
	Excess energy intake	19	46

Table 4. Analysis of factors related to the suitability of energy needs

Variables	Value	p-value
Activity type	6.977	0.031
Nutritional Status	13.748	0.008

respondents had normal body conditions, and 17% of respondents were underweight (Table 2).

Comparison of Energy Intake and Energy Needs

Based on the results of the comparison distribution between energy intake and energy demand, it is known that as many as 46% of respondents have excess energy adequacy, 32% of respondents have energy adequacy that is in accordance with what is consumed, and 22% of respondents still have insufficient energy (Table 3).

Analysis of factors related to the suitability of energy needs

Based on the result of the analysis, the type of activity has a significance value or p-value less than the alpha value (α) of 0.05, which is 0.031. This result means that the type of activity has a significant influence on the suitability of energy

needs. Then, the nutritional status also has a significance value ($p = 0.008$), which means nutritional status has a significant influence on the suitability of energy needs (Table 4).

DISCUSSION

Occupational nutrition is a branch of nutrition science that is applied to the workplace in order to meet the nutritional needs of the workforce and to maintain and improve their nutritional status and health in order to maximize their work capacity and productivity.⁶ Aspects that affect work nutrition are in the form of nutritional needs for workers as a group in society, calories needed to carry out work, environmental factors that affect the nutritional status of workers, and nutrition for work productivity.⁷ In general, the nutrients needed by workers are the same as those needed in daily activities, namely carbohydrates, proteins, fats, minerals, and

water. As a result of the lack of nutritional intake for workers, namely the body's defense against disease decreases, physical ability is lacking, weight decreases, the body becomes thin, pale faces are less enthusiastic, lack motivation, and react slowly.²

Nutritional status is the health status produced by the balance of nutritional needs and inputs, or nutrients. It takes more than 40 types of nutrients every day to achieve balanced nutrition. If the need is greater than the input, it is called undernutrition status; if the need is balanced with the input, it is called balanced nutritional status; and if the need is less than the input, it is called more nutritional status.⁶ A good habit is to eat three times a day. If you only eat once a day, food consumption, especially for children and other nutritional needs, will not be met no matter how you serve it. The complete menu consists of staple foods, vegetables, animal side dishes, vegetable side dishes, and fruits. The menu arranged in such a way is sufficient to meet the requirements.⁸

Based on research by Sari and Muniroh (2017), the energy intake of workers is categorized as less if 77% of energy sufficiency (AKE).⁹ In the Regulation of the Minister of Health of the Republic of Indonesia Number 29 of 2019 concerning the recommended nutritional adequacy rate for the Indonesian people, it is stated that the average energy adequacy rate for the Indonesian people is 2100 kcal per person per day at the consumption level. As for 77% of 2100 kcal is 1617 kcal, so energy intake <1617 kcal is included in the less category and energy intake 1617 kcal is included in the sufficient category.¹⁰ Fulfillment of nutrition in workers can affect the physical condition of workers. Study about work nutrition in relation to fatigue conducted by Dyahumi and Nur Ulfah (2012) at a company in Purbalingga, it was found that 50% of workers experienced an energy consumption deficit. After being tested using logistic regression analysis, it can be concluded that workers who have a deficit level of energy consumption will have a probability of 75.57% (if the variables included are only energy and protein)

or 77.8% (if the variables included are energy, protein and anemia) for fatigue to occur.¹¹ The limitation of this study is that it was only able to cover a small population. Therefore, it is necessary to do research about the nutritional intake and nutritional needs of the workers using a larger population in order to determine the suitability of the nutritional status of the workers in the future.

CONCLUSION

Improving the community's nutritional status is one of the efforts that substantially impacts the quality of human resources. Workers need an appropriate nutritional intake in order to carry out work activities in accordance with their respective duties. The suitability of energy intake can also affect a person's productivity, because if a person consumes excess or less energy, it can in the long term affect their health status or nutritional status, which, if left unchecked, will affect their activities and affect their productivity. Therefore, it is necessary to socialize, monitor, or supervise and improve the suitability of energy intake for workers. Workers must also adopt a healthy lifestyle by resting the body, not taking too much time to rest, and increasing sports activities for the body's fitness.

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ETHICAL CONSIDERATIONS

This research had received ethical approval from Faculty of Health, University of Nahdlatul Ulama, Surabaya.

CONFLICT OF INTEREST

This research was conducted in 2022 and has never been published anywhere. The authors stated that there is no conflict of interest.

AUTHOR CONTRIBUTIONS

All authors have the same contribution in conducting this study.

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