



The Relationship Between Nutritional Status and Physical Performance of Workers and Sports Athletes, A Literature Review

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ABSTRACT

Balanced nutrition is a key factor in improving workers' physical and mental performance. This study explores the existing literature on the relationship between balanced nutritional intake and worker performance. Using a systematic literature review method, 20 journals published within the last ten years were analyzed to examine the impact of balanced nutrition on worker productivity and health. The results reveal that workers with good nutritional status exhibit more optimal physical and mental performance, leading to increased work productivity. Conversely, malnutrition can result in decreased work capacity, fatigue, and higher health risks. This study emphasizes the importance of providing nutritious food in the workplace and educating workers on healthy eating patterns. Balanced nutrition supports long-term health while improving workers' efficiency and quality of life. Companies are encouraged to consider nutritional aspects in employee health programs to foster a more productive and healthy work environment.

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INTRODUCTION

In the world of work, physical and mental performance is one of the things that is often used as an important indicator in assessing a worker's performance. A worker with good physical and mental performance will show work productivity that good too. In this case, a worker's work productivity certainly needs to be supported by various components of occupational health and safety, one of which is by providing a balanced intake of nutrients or according to the worker's body needs (Kusuma et al , 2023).

Nutritional status is one of the elements in determine the condition physique or the physical quality of a person or group of people certain. On basically Working is a physical activity that always requires energy from nutritional intake. The more physical activity, the more energy is needed. Individuals with good nutritional status store energy reserves better. and relatively longer remaining in work compared to individuals with poor nutritional status

A balanced diet is a diet that provides the various nutrients the body needs in sufficient amounts. appropriate, in accordance with need physiological body. Balanced nutrition can also be interpreted as a daily food composition that contains nutrients in the right types and quantities. varies which customized with the body's needs. A balanced

nutritional diet for workers is of course given by paying attention to the principles of food diversity, physical activity, and behavior. life clean And maintaining normal body weight to prevent nutritional problems (Indonesian Ministry of Health, 2014).

Nutrition is a substance found in food and drink that is needed by the body as a source of energy for body growth. Nutrition is important factors for creating future human resources quality. The habit of consuming food that exceeds the body's needs can cause problems with excess nutrition. Conversely, malnutrition problems arise due to unmet nutritional needs (Festi, 2018).

Occupational nutrition is one of the requirements for achieving optimal health, especially for workers. workers. The condition of excess or deficiency of nutrition experienced by workers will affect their health condition and mobility ability so that it can affect ability Work and productivity (Maedah, Alda Luna., et al, 2023).

Health and workforce are an inseparable unity, one of which is fulfilling the nutritional needs of workers. the work that in accordance with the nutritional status of each worker, workload in reach And increase efficiency and the level of worker productivity (Olusegun et al, 2014). Worker who have normal nutritional status have a higher level of good productivity. Thin or fat nutritional status in workers, although the percentage found is not large but needs attention. This shows that the health and productivity of workers are very closely related to nutritional status. Consumption food that various and balanced and improving appropriate nutritional status are important factors in improving the quality of human life and will greatly affect worker productivity (Ang Gi, 2021). Work fatigue is a process decreasing efficiency, performance work and reduce physical strength/endurance the body to continue the activities that must be done. Nutrition or nutrition in workers is one of the factors cousing work fatigue. One of them one important aspect nutrition for workers is the works energy intake. Energy intake that no in accordance with the energy needs of a worker will make the worker feel tired faster. Energy intake is amount energy. Which obtained from manufactured foods (Daniel Tasmi, 2015).

It is known that an imbalance in nutrient intake will impact worker productivity. For example, workers with an imbalance in nutrient intake (not according to the body's needs) will tend to get sick easily and their immune system will tend to decrease. This will cause a decrease in the physical and mental performance of workers.

METHOD

This literature review utilizes journals sourced from databases such as Google Scholar and PubMed, published between 2014 and 2024. The review focuses on keywords including "balanced nutrition," "worker performance," and "mental health." A total of 20 journals were selected for detailed analysis



RESULT

The results of *the review* based on 20 selected journals have been presented in detail in Table 1 below.

Table 1. Results Review 20 Journal Selected

No	Title	Method	Result
1	Improving employee health through managing food consumption patterns at PT Bina Sukses Lestari (Kusuma <i>et al</i> , 2023).	Survey and Observation	The research results showed positive results where employees became wiser in choosing what food they should consume. Improvement awareness and changes in food consumption patterns have improved employee attendance and productivity. Employees have also experienced an increase health physique And seen more fit from the previous.
2	The relationship between nutritional status and productivity levels on gas station workers (Ulasawini <i>et al</i> , 2022).	Survey and Observation	The results of the study showed that nutritional status was not directly related to exposure to substances. hazardous chemicals and the productivity level of gas station workers. However, nutritional status may be related to fatigue. Work And health gas station workers. This can lead to a decrease in productivity And performance worker Gas station.
3	Overview of nutritional status and work fatigue on worker operator container crane in PT. X (Hardianti <i>et al</i> , 2023).	Descriptive Observational	Results study show nutritional status worker operator CC in PT. X based on Index calculation Body Mass Index (BMI) is mostly classified as normal, namely 50%. Workers who experience pre-obesity are 45% and as many as 5% of workers are obese. It is known that workers who experience obesity performance his physical condition tends to decline. This is caused by by pattern life And pattern Eat Which not enough Good.
4	Optimizing nutrition and well-being employees: Efforts to recognize influence pattern	Survey and Observation	The results of the study showed an increase in employee awareness about the importance of a balanced diet and food consumption patterns. Workers' eating patterns improve and increase their productivity and performance. become more Good from

	consumption food in environment Work PT. Bina Sukses Lestari (Kusuma <i>et al</i> , 2023).		previously.
5	Relationship between adequate intake energy And nutritional status with the level of work fatigue of production workers (Study at PT. Multi Aneka Pangan Nusantara Surabaya) (Sari <i>et al</i> , 2017).	Analytical Observation	Most of the workers who were respondents in this study aged <25 years (42.4%), the adequacy of energy intake is classified as lacking as much as 66.7%, the normal nutritional status is as much as 54.5%, and the level of work fatigue is classified as moderate, namely 63.6%. The results of the study showed that there was a relationship between the adequacy of energy intake ($p = 0.001$) and nutritional status ($p = 0.018$) with level fatigue worker's work .
6	Connection Nutrition Work, Technology That Used And Motivation Work With Harvester Coconut Palm oil PT. Synergy Agro District Industry Regency Support East Kutai (Suwignyo, Bematal Saragih, Ayusma Saputri, 2018)	Cross Sectional	Results study show that No There is connection nutrition Work with productivity Work harvester coconut palm oil PT. Sinergi Agro Industri (with p value = $0.114 > \alpha = 0.05$). There is a technological relationship that used with productivity Work harvester coconut palm oil PT. Synergy Agriculture Industry (with p value = $0.001 < \alpha = 0.05$). There is connection motivation Work with productivity PT. palm oil harvester work . Synergy Agriculture Industry (with p value = $0.007 < \alpha = 0.05$).
7	Habitual relationship breakfast And status nutrition with level fatigue Work worker production division of PT Maruki international Indonesia. (Michael satria, 2023)	Cross Sectional	Based on research results connection habit breakfast with level fatigue Work obtained mark p -value = 0,000 [$P < 0.05$], whereas results study connection status nutrition with the level of work fatigue obtained P -value = 0.004 [$P < 0.05$]. There is connection Which significant between habit breakfast And status nutrition with level fatigue Work worker part production PT Maruko international Indonesia 2022.



8	Connection status nutrition, diet and physical activity with productivity Work on workers at PT Gatra 2019. (Mutia shafitra, putri permatasari, agustina, marina ery, 2019)	Cross Sectional	There is a relationship between meal frequency and productivity [p-value = 0.015]. And there is a relationship between type of food with productivity [p-value = 0.046]. While The unrelated variable is physical activity with productivity [p-value = 0.624].
9	The relationship between nutritional status And level physical fitness with work productivity in female workers spinning unit 1 winding section pt. apac inti corpus bawen (Sri Rahayu Utami, 2014)	Cross Sectional	Data analysis using the Chi-Square test with $\alpha = 0.05$. And the results obtained were that there was relationship between nutritional status (p=0.005), physical fitness level (p=0.001) with productivity Work.
10	Nutritional Status, Physical Activity and Work Productivity Coal Mine Employee PT. Kaltim Prima Coal (Yasmeen Aulia Zahra, Hadi Riyadi, 2022)	Cross Sectional	The results of the correlation test show that there is no significant relationship between physical activity and nutritional status (p>0.05) and there is no significant relationship between nutritional status and work productivity (p>0.05).
11	The Relationship between Adequate Energy Intake and Nutritional	Analytical Observation	energy intake adequacy is classified as lacking (66.7%), normal nutritional status (54.5%), and the level of work fatigue is classified as moderate (63.6%). There is a relationship between adequacy of energy intake (p=0.001) and

	Status with Fatigue Levels Work of Production Workers (Study at PT. Multi Aneka Pangan Nusantara Surabaya) (Arini Rahmatika Sari, Lailatul Muniroh, 2017)		nutritional status ($p=0.018$) with the level of work fatigue of workers.
12	Nutritional Status and Energy Needs of Factory Workers in Indonesia. Kesya Desmarta et al (2023)	Qualitative Descriptive	The results of the study showed that the respondents had an average age of 28 years old with an average BMI of 22.62 kg/m ² and nutritional status varying from underweight (11.1%), normal (50%), excess heavy body (22.2%) to obesity (5.5%) and obesity level I (11.1%). Respondents also had several levels of energy intake, namely severe energy adequacy deficit (61.11%), mild energy adequacy deficit (11.11%), energy adequacy deficit (11.11%), energy adequacy category more (16.67%), And adequacy energy in the normal category (11.11%). It can be concluded that there are still many workers Which experience deficit adequacy energy.
13	Factors that Related to the Occurrence of Work Fatigue in Workers of PT. Kalla Kakao Industri in 2017 (Nyky Asriyani, Siti Rabbani Karimuna, 2017)	Analytical Observation	The results of the study showed that there was a statistical relationship ($p < 0.05$) between the variables of work ($p = 0.000$) and length of service ($p = 0.01$). On the other hand, there was no connection in a way statistics ($p > 0.05$) workload ($p = 0.121$) and nutritional status ($p = 0.921$) in PT workers. Call Cocoa Industry Subdistrict Ranomee Konawe south.
14	Connection Level Subjective Fatigue With Productivity In Packaging	Cross Sectional	The results of the study showed that there was no relationship between length of service and subjective fatigue, and there was no relationship between nutritional status and subjective fatigue.



	Workforce At CV Source Blessings (Lince Verawati, 2016)		subjective fatigue, there is a relationship fatigue subjective with productivity labor .
15	Nutritional Status, Breakfast Habits and Productivity Work <i>Startup</i> Employees (Alda Luna Maedah, Laras Sitoayu, Vitria Melani, Rachmanida Nuzrina, Mury Kuswari, 2023)	Cross Sectional	There is a significant relationship between BMI (p = 0.005), PLT (p = 0.010), and breakfast habits (p = 0.006) with employee work productivity. Nutritional status (BMI, PLT), breakfast habits are strongly related to the work productivity of <i>startup employees</i> .
16	Breakfast, Nutrient Intake Macro And Fluids, Perception of Room Temperature Comfort on Worker Performance Perception (Selly Apliyanti Wulandari, Idrus Jus'at, Erry Yudhya Mulyani, Mertien Sa'pang, Yulia Wahyuni, 2021)	Cross Sectional	There is a significant relationship between breakfast energy, protein intake, fat intake, and perception of comfort of work room temperature with performance perception $P\text{-value} \leq 50.05$. There is a nearly significant relationship (borderline) between carbohydrate intake , fluid intake with performance perception $P\text{-values} \leq 0.1$
17	Connection Burden Work, Pattern Eat, Status Nutrition Against Work Productivity in Doctors and Nurses In RS XYZ Sumatra South (Putu Ratih	Cross Sectional	The results of the study showed that workload has a positive effect on work productivity in doctors and nurses at XYZ Hospital, South Sumatra. Diet has a positive effect on work productivity in doctors and nurses at XYZ Hospital South Sumatra. Nutritional status has a positive effect on work productivity in doctors and nurses. in House Sick XYZ Sumatra South.

	Wijayanthi, Viera Dzakiyyah Muthoharoh, Ory Laras Fitkarani, Innocentius Bernarto, 2024)		
18	Nutritional Status Assessment of the Work Environment, Burden Work And Work Psychology Bank employees (Reniasinta, Syifa Qisthi Shabrina, Ade Lia Solikhah, Salwa Putri Nabila, Ananda Putri Febriaini, Sabrina Aprilia, Fransisca Bonita ⁷ , Umi Novianti, 2021)	Qualitative	The results of the study show that there is an influence of the work environment, workload, and work psychology on the nutritional status of bank employees.
19	The Influence of Healthy Lifestyle, Sleep Quality, and Diet on Mental Health Levels in Office Workers in West Java (Alifah Wilanda, Ahmad Shofi Mubarak, Emdat Suprayitno, Sri Sumarni, Suryadi Imran 2024)	Cross Sectional	The results of the study indicate that there is a relationship between lifestyle factors and mental health among office workers in West Java. The positive impact of healthy lifestyle choices, sleep quality, and diet on mental health underscores the need for strategies comprehensive in place Work.
20	Relationship between Nutritional Status and Energy Intake with Work Productivity of PT. Propack	Cross Sectional	The results of the study showed that there was no relationship between nutritional status and work productivity and there was a relationship between energy intake and work productivity. : analysis of the relationship between nutritional status and work productivity Work obtained p- value as big as



Workers Creation Mandiri Cikarang (Adam Stitaprajna, Mujahidil Aslam, 2020)	0, 459 And analysis The relationship between energy intake and work productivity obtained a p-value as big as 0.014 with odds ratio as big as 1.23 (95%CI).
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DISCUSSION

Based on the review results of the 20 journals above, it is known that a worker's physical and mental performance can be influenced by the habits of food intake that he consumes every day. Job demands often make a workers not pay attention to the food intake they consume. As a result, the level of worker productivity often tends to decrease. Balanced nutrition is one of the factor key in guard overall body health. In the context of workers, both in the formal and informal sectors, consuming nutritious and balanced food has a direct impact on physical and mental performance. Workers' nutritional needs must also be adjusted to the work environment and type of work. Balanced nutrition for workers is to ensure that workers get their calorie needs that are in accordance with their level of physical activity and the demands of their work. Proper nutrition plays an important role in maintaining balance energy body Which.

In turn, it affects the level of work power, physical performance of workers and also the mental performance of workers. Optimally balanced nutrition for workers can also increase the physical endurance of workers against pressure and stress that may arise in the environment Every individual has unique nutritional needs and differences This is influenced by a number of factors.

Nutrition is an important part of human health because it refers to the condition of oneself resulting from the intake, absorption, and use of nutrients from food in the long term. Good nutrition has an impact on the degree of health, body resistance to worker productivity. Excessive nutritional status also has an impact on the decline in body functions such as muscles, lungs, other organs that make the body work harder to keep up with it so that it becomes the cause of fatigue. While workers with poor nutritional status (low body weight) indicate an intake of calories Which No Enough. Intake calories Which low can cause somebody easy feel tired, have a tendency to experience low blood pressure or commonly known as anemia. Low blood pressure and intake calories Which not enough to cause worker easy feel tired. Malnutrition has an impact Which negative, Because person Those who suffer from malnutrition especially calories, will have their work ability affected, and the time it takes to complete their work. also getting longer , so that productivity decreases. Malnutrition Also can give a physiological impact And functional, like growth disorders, function immune decrease and risks infection increase, impaired cognitive development, work ability to become limited, risk disease chronic increased, injury And trauma difficult recover. Malnutrition can affect the ability Work Because lack nutrients, specifically energy And protein, In the early stages, it causes long-term hunger time certain heavy body weight loss Which accompanied by with ability (productivity) Work. To overcome this, a program is needed that aims to increase workers'

understanding of the importance of balanced nutritional intake so that their productivity is maintained while working. work. Type program Which The results of another study conducted by Michael Satria (2023) stated that there is a significant relationship between breakfast habits and nutritional status with the level of work fatigue of workers. The results of the study conducted by Mutia Shafitra et al (2019), At PT Gatra There is a relationship between nutritional status and productivity [p-value = 0.026]. There is a relationship between meal frequency and productivity [p-value = 0.015]. And there is a relationship between the type of food with productivity [p-value = 0.046]. While the unrelated variable is physical activity with productivity [p-value = 0.624].

Research conducted by Sri Rahayu Utami (2014), stated that there is connection between status nutrition And level of physical fitness with work productivity. Yasmeen Aulia Zahra et al (2022) also stated that the results of the correlation test showed that there was no significant relationship between physical activity and nutritional status ($p > 0.05$) and there was no significant relationship between nutritional status nutrition with work productivity ($p > 0.05$).

According to Arini Rahmatika Sari et al's research (2017), There is a relationship between the adequacy of energy intake and nutritional status with the level of work fatigue of workers. The adequacy of energy intake that is increasingly lacking or increasingly deficit will increase work fatigue. According to research by Kesya Desmarta et al (2023), Based on the results of the study, There are still many workers who experience a deficit in energy sufficiency. In fact, workers' nutritional intake plays a role in welfare and increasing work discipline and productivity. Food given to workers should contain substance nutrition macro and also micro and can be adjusted to the contents of my plate to comply with the Balanced Nutrition Guidelines. Food and drinks provided by the workplace should meet at least 40% of the energy requirements. during 24 O'clock. According to study Nyky Asriyana et al (2017) Results The study showed that there was a statistical relationship between work variables and work period. On the other hand, there was no statistical relationship between workload and nutritional status of workers. PT. Kalla Kakao Industri Kec. Ranomee Konawe Selatan.

The results of a study conducted by Putu Ratih Wijayanthi et al (2024), showed that workload has a positive effect on work productivity in doctors and nurses at XYZ Hospital, South Sumatra. Based on the analysis of existing journals, the ideal way to meet workers' nutritional needs and improve work productivity among doctors and nurses at XYZ Hospital, South Sumatra, involves ensuring adequate nutritional intake. Nutritional status has a positive effect on work productivity, as evidenced by various studies. For instance, research by Arini Rahmatika Sari et al. (2017) highlights that inadequate energy intake or an increasing energy deficit can lead to work fatigue, resulting in physical exhaustion and reduced productivity. Similarly, research by Kesya Desmarta et al. (2023) reveals that many workers still experience deficits in energy adequacy. Proper nutritional intake is essential, as it not only supports workers' well-being but also enhances work discipline and productivity.

CONCLUSION

Balanced nutrition is essential for supporting workers' physical and mental performance, directly influencing their productivity and overall quality of life. Companies are advised to integrate nutritional support into health programs to foster a healthier and more productive workforce.



RECOMMENDATION

This study emphasizes the importance of providing nutritious food in the workplace and educating workers on healthy eating patterns. Balanced nutrition supports long-term health while improving workers' efficiency and quality of life. Companies are encouraged to consider nutritional aspects in employee health programs to foster a more productive and healthy work environment.

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