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The Relationship Between Nutritional Status and Work Stress on the Work Productivity of Research Institute Employees

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Abstract: Work productivity plays a critical factor in determining the success of an institution, particularly within research environments where high levels of concentration, analytical precision, and cognitive performance are essential. In the context of increasingly complex occupational demands, work-related stress has garnered significant attention due to its potential adverse impact on both physical and mental performance. However, there are several factors that are often overlooked especially in a work environment, employee's nutritional status and work-related stress, both factors are known to have contributed to employee welfare. This study aimed to analyze the relationship between nutritional status and work-related stress with the productivity of employees at a research institute. A cross-sectional study design was employed using a total sampling method involving 55 respondents at a research institute. Data were analyzed through univariate and bivariate analyses with the chi-square test. The findings of this research revealed no statistically significant relationship between nutritional status (p=0.104), work stress (p=0.462) with employee work productivity. These results suggest that, within this specific context, neither nutritional status nor work stress appears to be a primary determinant of work productivity. Nonetheless, given the multifactorial influences on work productivity, incorporating strategies that promote effective stress management and support overall employee well-being remains imperative. Further research with larger sample sizes and more comprehensive variables is recommended to better understand the determinants of productivity in research settings.

Keywords: Nutritional Status, Work Stress, Work Productivity, Employee

1. INTRODUCTION

The rapid advancement of technology, coupled with the increasing digital integration of modern work environments and heightened awareness of employee well-being, has contributed to a surge in research activities across various disciplines. These developments, characterized by high cognitive demands, have compelled institutions and organizations to strategically optimize their human resources in order to effectively navigate increasingly complex challenges (Khasanah et al., 2023). According to a study conducted by the International Labour Organization (ILO) (2005), poor nutritional status in the workplace may result in a loss of up to 20% in national workforce productivity, whether due to undernutrition or obesity. This finding highlights the critical role of nutritional status in the workplace in enhancing efficiency and achieving optimal work performance.

Good nutritional status in adults, particularly in professional settings, plays a vital role in supporting various physiological and psychological functions, including cognitive

performance, immune system strength, and work-related stamina (Puri et al. (2023); Munteanu & Schwartz (2022); Rajabi et al. (2021)). Among employees working in research institutions, where tasks often demand prolonged concentration, critical thinking, and mental resilience, optimal cognitive capacity is essential. In this context, normal and balanced nutrition becomes fundamental—not only to meet energy requirements but also to maintain emotional stability, both of which are key to sustaining high productivity. Moreover, sufficient nutritional intake has been found to help mitigate stress, a factor known to negatively impact focus, motivation, and overall work performance (Mental Health Foundation, 2017).

According to data from the World Health Organization (WHO) in 2022, the global prevalence of undernutrition among adults was 8.8% in males and 9.7% in females, while 43% were categorized as overweight and 16% as obese. In Indonesia, data from the 2018 Riskesdas (Riset Kesehatan Dasar) conducted by the Ministry of Health reported that among adults, 9.3% were underweight, 13.6% overweight, and 21.8% obese. More recent data from the 2023 Indonesian Health Survey (Survei Kesehatan Indonesia), which continues the Riskesdas dataset, showed that 7.8% of adults were underweight, 14.4% overweight, and 23.4% obese. In the workplace context, employees' nutritional status had an impact on their work productivity. There is a significant potential of nutritional status as a factor in encouraging employees to pay closer attention to their dietary patterns—specifically the quantity, quality, and variety of food consumed—in order to support and sustain productivity in the workplace (Bakri et al., 2021).

Poor nutritional status can affect not only an individual's physiological condition but also their psychological well-being. Stress is one of the most common psychological responses of the body. Among employees, stress is a prevalent challenge frequently encountered in the workplace. It has been shown to significantly influence work productivity and employee performance in carrying out professional responsibilities (Jalagat, 2017). Employees are often the primary individuals affected by work-related stress; however, its consequences inevitably extend to the organization as well. Occupational stress does not occur in isolation—it typically arises following events that impact an individual's psychological state. Such events are often perceived as beyond the individual's coping capacity, thereby exerting significant pressure on their mental and emotional well-being (Alfikri et al., 2021).

Work-related stress can be triggered by various factors, such as an individual's role or position within the organization, workload demands, tight deadlines, role ambiguity, and job expectations (Lestari & Rizkiyah (2021); Lagrosen & Lagrosen (2022); Chung et al. (2022)). Adverse stress can trigger a range of physiological and psychological responses that vary across individuals, including deteriorating physical health, reduced work productivity, and, in cases of more severe stress, the onset of depression (Eka Safitri & Gilang, 2020).

Fundamentally, the primary sources of occupational stress stem from demanding job tasks and the employee's perceived inability to complete them within the required timeframe. In addition to its impact on productivity, work-related stress can also affect employees' physical health. Stress may influence individuals' food choices, often leading to unhealthy eating behaviors. Previous research has shown that, in some cases, stress can increase the consumption of high-fat, sugary, and sodium-rich foods while decreasing the

intake of nutritionally beneficial foods such as fruits and vegetables (Khaled et al., (2020), as cited in Aras et al. (2024)). Given the potential influence of work stress on dietary behaviors and employee health, this study aims to examine the relationship between nutritional status and work stress on the work productivity of research institute employees. Therefore, promoting healthy eating habits in the workplace may serve as a strategic initiative to improve employees' overall health and enhance their work performance (Grimani et al., 2019).

2. METHODS

Study Design

This study uses a quantitative, analytical observational approach with a cross-sectional study design, examining data from a population at a single point in time. In a cross-sectional study, the researcher simultaneously investigates both the outcomes and characteristics of the individuals being studied (Wang & Cheng, 2020). Given the use of a cross-sectional method, it is likely that the number of samples obtained will be small. The research was conducted from May to June 2025.

Study Participants

The respondents in this study consisted of employees at a research institute, classified into two distinct age groups, early adulthood (22–40 years old) and middle adulthood (41–55 years old). The population in this study is known to be 88 people as of June 2025. To determine the minimum sample of this study and to anticipate possible dropouts or non-response, the Slovin formula (1960) was conducted, a total of 47 respondents was deemed sufficient. The sampling technique used in this study was total sampling, in which all members of the population who met the inclusion criteria were selected as research respondents. However, not 88 individuals were included in the final sample. Several factors like unwillingness to participate or individuals not meeting the inclusion criteria upon closer screening. As a result, only 55 eligible and consenting individuals were included as research respondents.

Data Collection

The instruments used in this study were informed consent, questionnaires, which included respondent characteristics, a work stress questionnaire adapted from the Perceived Stress Scale-10 (PSS-10) by Cohen (1983), and the six-item work productivity questionnaire that had demonstrated good construct validity, with all item-total correlation coefficients (r calculated > r table), also showed strong reliability, as indicated by a Cronbach's Alpha of 0.871, confirming its consistency and suitability for use in employee population. Anthropometric measurements were obtained using a microtoise for height and a digital body scale for body weight. Data were analyzed using IBM SPSS Statistics and Microsoft Excel to ensure accurate and efficient data management and analysis.

Statistical Analysis

Data analysis in this study involved two approaches: univariate and bivariate analyses. The univariate analysis was used to describe the data through measures such as

percentages, frequencies, means, and standard deviations. Concurrently, the bivariate analysis employed the chi-square test to assess the presence of a statistically significant association between nutritional status and work stress on work productivity.

Ethical Approval

Ethical clearance for this research was granted by the Health Research Ethics Committee of Universitas Prima Indonesia, with approval letter number No. 104/KEPK/UNPRI/VI/2025. Prior to participation, all respondents gave written informed consent, ensuring their voluntary involvement in the study.

3. RESULTS AND DISCUSSION

Subject's Characteristics

Out of 55 respondents, it is known that 35 (63.6%) were male and 20 (36.4%) were female. Fitriadi et al. (2018b) stated in her study that there is no significant relationship between gender and work productivity. This finding indicates that there is no notable difference in productivity levels between male and female employees.

In terms of age characteristics, the majority of respondents were in the early adulthood period, with 38 respondents (69.1%) categorized as early adults and 17 respondents (30.9%) as middle adults. This consistent with Zulkifli et al. (2019), who reported that 60% of respondents were in early adulthood (18-40 years). Kurniasari & Ibrahim (2023) argue that work productivity declines from early to middle adulthood. This decline is linked reduced muscle strength, lung function, and vision, all of which may negatively affect work performance.

In this study, nutritional status is classified as abnormal and normal. Abnormal nutritional status is characterized by body mass index (BMI) values that are <18.5 kg/m^2 and >25.0 kg/m^2, while normal nutritional status is characterized by a BMI within the range of 18.5–25.0 kg/m^2. From this study, it is known that an abnormal nutritional status was slightly higher than those with a normal nutritional status, accounting for 30 individuals (54.5%) and 25 individuals (45.5%), respectively. Annurullah et al. (2021) noted that office workers often engage in prolonged, repetitive sedentary activity, such as sitting in front of a computer. This low energy expenditure leads to excess energy being stored as fat (Wansyaputri et al., 2020).

Table 1. Characteristics of Subjects

Variables	n	%
Age Group		
Early Adulthood (22–40 years old)	38	69.1
Middle Adulthood (41–55 years old)	17	30.9
Gender		
Women	20	36.4
Men	35	63.6
Nutritional Status		
Normal Nutritional Status	25	45.5
Abnormal Nutritional Status	30	54.5
Work Stress		
Low Stress	15	27.3

Moderate Stress	37	67.3
High Stress	3	5.5
n	**55**	**100.0**

The majority of respondents were categorized as experiencing moderate levels of work-related stress (67.3%), while 15 respondents (27.3%) reported to have low stress levels, and only 3 respondents (5.5%) were classified as experiencing high stress levels. These findings indicate that moderate stress is the most prevalent category among employees in the research institute setting. This distribution is consistent with the results of a study by Fitriana & Rosid (2024), who similarly found that a significant proportion of their participants experienced moderate levels of stress. The consistency between these findings suggests that moderate work-related stress may be a common phenomenon across similar occupational environments, particularly those that demand high cognitive engagement and adherence to strict deadlines, such as research institutions.

The Relationship Between Nutritional Status and Work Productivity

Based on Table 2, it was found that 3 respondents with abnormal nutritional status had low work productivity, 27 respondents with abnormal nutritional status had high productivity, and 25 respondents with normal nutritional status also demonstrated high work productivity. The results of the chi-square test indicated no significant association between nutritional status and work productivity, as evidenced by the p-value of 0.104 ($p > 0.05$). This finding is consistent with the study conducted by Fitriadi et al. (2018a), which also found no significant relationship between nutritional status and work productivity, reporting a p-value of 0.119 ($p > 0.05$). It is possible that other external factors contributed to the respondents' level of work productivity. These factors may include a high degree of work motivation or strong work spirit. As explained by Sumigar et al. (2020) in their study on work motivation, nutritional status, and work productivity, some employees with undernutrition were found to have high productivity, and the majority of respondents with good work motivation demonstrated good work performance.

Table 2. The Relationship Between Nutritional Status and Work Productivity

Nutritional Status	Work Productivity				Total		P-Value
	Low		High				
	n	%	n	%	N	%	
Abnormal	3	5.5	27	49.1	30	54.5	0.104
Normal	0	0.0	25	45.5	25	45.5	
n	**3**	**100.0**	**52**	**100.0**	**55**	**100.0**	

The Relationship Between Work Stress and Work Productivity

Based on table 3, it was found that 15 respondents with low work stress exhibited high work productivity. Additionally, 3 respondents with moderate work stress had low productivity, while 34 respondents with moderate stress showed high productivity. Furthermore, 3 respondents with high stress levels also demonstrated high productivity. Based on the p-value obtained from the Chi-Square test, no significant correlation was found

between work stress and productivity levels. This is supported by the p-value result of 0.462, which is greater than the significance level of 0.05 (p > 0.05).

Table 3. The Relationship Between Work Stress and Work Productivity

Work Stress	Work Productivity				Total		P-Value
	Low		High				
	n	%	n	%	N	%	
Low Stress	0	0.0	15	27.3	15	27.2	0.462
Moderate Stress	3	5.5	34	61.8	37	67.3	
High Stress	0	0.0	3	5.5	3	5.5	
n	**3**	**100.0**	**52**	**100.0**	**55**	**100.0**	

This result is in line with the study conducted by Cherny & Kartikasari (2017), which found that based on the F-test, the obtained value was 0.111 (p > 0.05), indicating that the stress variable had no significant effect on work productivity. The Yerkes-Dodson Law (1908) also supports this finding. In general, the Yerkes-Dodson Law is illustrated by an inverted U-shaped curve, which suggests that human productivity can increase when individuals are exposed to physiological or psychological stimulation (stress). However, such stimulation has a positive effect only up to a certain point—referred to as the optimal arousal level. Beyond this point, excessive stimulation may lead to a decline in productivity.

Referring to the study conducted by Fianti (2017), the high productivity observed among respondents with low stress levels may be attributed to strong social support, both from family and a supportive work environment. Such support can manifest in positive interpersonal relationships and collaborative efforts among colleagues in accomplishing work-related tasks. On the other hand, Lazarus and Folkman (1984), in their theory of stress and coping, suggest that stress is a dynamic perception resulting from the interaction between an individual and their environment. Therefore, coping ability becomes a key determinant of whether stress will have a negative impact or, conversely, serve as a motivating factor for the individual.

4. CONCLUSION

The findings of this study indicate no significant relationship between nutritional status (p=0,104) and work stress (p=0,462) on employee work productivity. This outcome suggests that other, perhaps more immediate and specific factors—such as the quality of the work environment, individual motivation, or a strong sense of work purpose—may play a more substantial role in influencing productivity outcomes. These results contribute to the broader literature by challenging the assumption that nutritional status and stress are universally predictive of productivity, particularly in workplace settings where psychosocial and organizational dynamics are more dominant. This study encourages further research into productivity using a more holistic and context-specific approach. However, limitations include a narrow definition of productivity and reliance on self-reported data, which may introduce bias. Future research should consider longitudinal designs and incorporate factors like individual motivation, job satisfaction, and workplace culture to better understand the multifaceted determinants of employee productivity.

CONFLICT OF INTEREST

The authors declare that there are no conflicts of interest.

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