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The Relationship between Nutritional Status, Breakfast Habits, and Sleep Duration on Workers' Productivity at PT. Sejahtera Buana Trada Sunter

Hubungan Status Gizi, Kebiasaan Sarapan, dan Durasi Tidur terhadap Produktivitas Pekerja PT. Sejahtera Buana Trada Sunter

Akhsan Fikri Wiguna[1]*, Megah Stefani[1]

[1]Nutrition Study Program, Faculty of Food and Health Technology, Sahid University, Jakarta, Indonesia

ABSTRACT

Background: Indonesian productivity has increased by 3.1% per year over the last 25 years. Human resources are critical, and they must be of high quality.
Objectives: The objective of this study was to look at the relationship of nutritional status, breakfast habits, and sleep duration on workers' productivity at PT. Sejahtera Buana Trada Sunter.
Methods: The subjects in this study were 39 workers, and it was conducted in April–July 2022. This study was designed as a cross-sectional study with purposive sampling. The subjects for this study had to be between the ages of 18 and 55, employees of PT Sejahtera Buana Trada Sunter, and have worked for at least one year. Subjects who fasted to analyze their food intake were excluded from this study. The data were analyzed using the chi-square test. Primary and secondary data were used in this study.
Results: The productivity of the workforce at PT. Sejahtera Buana Trada Sunter (71.8%) is high and rated as good. There is a significant relationship between worker productivity and breakfast habits (p-value = 0.003), sleep duration (p-value = 0.004), and nutritional status (p-value = 0.002).
Conclusions: The study found a relationship between the productivity of PT. Sejahtera Buana Trada Sunter employees and their breakfast habits, sleep duration, and nutritional status.

INTRODUCTION

In Indonesia, productivity has increased by 3.1% per year during the previous 25 years. In terms of productivity per worker, Indonesia was placed fourth in ASEAN and eleventh among the 20 member nations of the Asian Productivity Organization (APO) in 2018[1]. In 2015, worker productivity in Indonesia was USD 24.3 thousand[1]. The government's SDG aims, notably goal 8, which promotes inclusive and sustainable economic growth, a productive and complete workforce, and decent work for everyone, are aligned with worker productivity[2].

Each worker has a unique Body Mass Index (BMI), which might have an impact on job productivity. Improving workers' nutritional status is one approach to addressing this issue[3]. A person's nutritional status will be excellent if they consume the appropriate amount of food to suit their body's demands[4]. Malnutrition can be caused by a lack of nutritional intake, and excess nutrition can be caused by excessive nutritional intake[4]. People

who do not consume enough nutrients that can be used as a source of energy will be unable to walk, work, or do other duties. They will feel fatigued and less productive as a result. A malnourished individual will have less energy overall, will be weak and unenthusiastic, and will be less productive at worK[4]. Breakfast is essential for everyone since it provides energy to carry out activities throughout the day. Breakfast is critical for meeting nutritional demands in the morning and for achieving balanced nutrition[5]. Breakfast is an eating and drinking activity that occurs between the hours of waking up and nine o'clock in the morning. Breakfast is utilized to meet a portion of one's daily nutritional demands in order to promote a more productive lifestyle[6]. A healthy breakfast can supply the body with the nutrients it needs to function optimally both mentally and physically[6]. Breakfast with sufficient nutrition may supply supplies for the body to think and also carry out the finest physical activities after waking up[7]. Early in the morning, prepare

and consume food and beverages prior to proceeding with daily activities in order to have a nutritious breakfast[6]. A fairly good breakfast is always cooked in the morning, not before noon, and the same on weekdays and holidays[5].

Adults or someone in the age range of 18–40 years need 7 to 8 hours of sleep per day[8]. Adults require at least seven hours of sleep every night to function well[9]. Short sleep duration is defined as sleeping for fewer than seven hours in a 24-hour period[9]. About 30% of adults have <6 hours of sleep each night[9]. This is the rationale for undertaking this research, as stated above. This study aims to analyze the relationship between nutritional status, breakfast habits and sleep duration on worker productivity at PT. Sejahtera Buana Trada Sunter.

METHODS

This study design employed observational research with a cross sectional design. Workers from PT Sejahtera Buana Trada Sunter served as research subjects. The research took place from April to July 2022. Subjects were chosen using the purposive sampling approach. Workers of PT Sejahtera Buana Trada, subjects aged 18-55 years, and subjects who had worked for at least one year were all eligible. Subjects were excluded from this study if they were fasting at the time of data collection. According to the lemeshow formula, the minimal number of subjects out of 60 workers was 37, the projected drop out was 10%, and the total number of subjects was 45. Because six workers dropped out, only 39 were examined.

This study collected two types of data: primary and secondary data. Primary data included subject characteristics, breakfast habits, sleep duration, and anthropometric data. Direct interviews were conducted using a questionnaire developed by researchers based on earlier research that had passed validation testing, and direct anthropometric measurements were taken. After being provided the instructions for filling out the questionnaire by the researcher, subjects completed it independently to acquire data on subject characteristics.

Anthropometric measures taken by researchers and skilled enumerators are used to collect nutritional status data. Body weight (BW) and height (H) are measured directly using a digital scale (body weight scale) calibrated to an accuracy of 0.1 kilograms and a microtoise calibrated to an accuracy of 0.1 centimeters for anthropometric measurements. Data on breakfast behaviors were collected by interviews, validated questionnaires, and 7 consecutive days of morning meal diaries. The Pittsburgh Sleep Quality Index (PSQI), which incorporated sleep length components developed by researchers, was also utilized to collect sleep duration data. The PSQI's validity was assessed by having workers other than the respondents fill out the questionnaire. Secondary data was KPI or key performance indicator data generated by each employee of PT Sejahtera Buana Trada Sunter, where the research was conducted. This study complied with the ethical guidelines outlined in No.081/PE/KE/FKK-UMJ/V/2022.

Data processing included activities such as data editing, coding, data entering, and data cleansing. SPSS version 22 for Windows was utilized for data analysis,

while Microsoft Excel 2010 was used for data processing. Data preparation and analysis included both univariate and bivariate analysis. To describe the properties of each variable, a univariate analysis was performed. The independent variable is respondent characteristics, which include nutritional status, breakfast habits, and sleep length, while the dependent variable is worker productivity. Bivariate analysis is used to determine the relationship between two related variables, the independent and dependent variables. The chi-square statistical test, with a significance threshold of 0.05, demonstrates the association between two variables. The findings of statistical computations are meaningful if the p-value is less than 0.05 and are not meaningful if the p-value is more than 0.05[10].

RESULTS AND DISCUSSION

Table 1 shows that the majority of subjects were in the 18-29 year age group, with 26 workers (66.7%), the 30-49 year age group (30.7%), with 12 workers, and the 50-56 year age group (2.6%). The majority of the workers (66.7%) were men, with the remaining (33.33%) being women. Most workers (53.8%) had a tertiary education. Meanwhile, the other workers (46.2%) had completed high school/equivalent education. Some workers (69.2%) had only been at PT Sejahtera Buana Trada Sunter for 5 years, the others (25.7%) had been there for 6-10 years, and just (5.1%) had been working for more than 10 years.

Overall, 18 workers (46.2%) had good nutritional status, 19 workers (48.2%) had better nutritional status, and 2 workers (5.1%) had low nutritional status. The nutritional condition of workers at PT. Sejahtera Buana Trada Sunter was classified as unfavorable, with 16.4 being the lowest BMI and 37.9 being the highest. In terms of breakfast habits, (59.0%) of workers were used to eating breakfast, while (41.0%) were not. This demonstrated that the breakfast habit at PT. Sejahtera Buana Trada Sunter was regarded good. Workers with good sleep duration (56.4%) outnumbered those with poor sleep duration (43.6%). A good sleep length is 7 hours or more of sleep every night. This indicates that sleep duration at PT. Sejahtera Buana Trada Sunter was good or fair. Apart from that, the productivity of PT. Sejahtera Buana Trada Sunter was very good, with the majority of workers (71.8%) doing well. Work productivity is a metric that assesses the link between a company's output and income and the role of the workers in determining performance outcomes.[11].

The work values of PT. Sejahtera Buana Trada Sunter were used in this study to estimate worker productivity. Productivity levels were classified into two categories in this study: high and low productivity levels. Workers in the workshop department had low output if they did not complete tasks on time or well and had low work values, whereas workers in the sales and marketing department had low output if they did not meet sales targets, had a poor attitude, lacked discipline, did not show personal progress, and did not follow the company's existing standard operational procedures. Productivity is said to be high in the workshop department if employees complete work on time or do their work well and have good work values, and in the sales and marketing department if employees make sales

according to predetermined targets, have a good attitude, a high level of discipline, demonstrate personal progress, and follow the company's standard operating procedures well.

Table 1. Frequency distribution of characteristics, nutritional status (BMI), breakfast habits, sleep duration and worker productivity at PT. Sejahtera Buana Trada Sunter

Characteristics	n (39)	%
Age (Year)		
18-29	26	66.7
30-49	12	30.7
50-64	1	2.6
Gender		
Male	26	66.7
Female	13	33.3
Education		
High School	18	46.2
University	21	53.8
Working Period		
≤5 years	27	69.2
6-10 years	10	25.7
> 10 years	2	5.1
Nutritional Status		
Less Nutrition	2	5.1
Excess Nutririon	19	48.2
Good Nutrition	18	46.2
Breakfast Habit		
Irregulary having breakfast (<4x/week)	16	41.0
Regularly having breakfast (≥4x/minggu)	23	59.0
Sleep Duration		
Poorly (<7 hours/day)	17	43.6
Good (≥7 hours/day)	22	56.4
Workers Productivity		
Low Productivity	11	28.2
High Productivity	28	71.8

In Table 2, male workers had an average total energy breakfast intake of 401.5 kcal (15.4%) and protein 14.2 g (21.8%), while female workers had an average total energy breakfast intake of 338. 3 kcal (15.3%), and 11.4 g protein (19.0%).

Table 2. Average distribution of energy and protein from breakfast food records (7 days) based on gender

Nutrients	Male		Female		Total	
	Average±SD	% AKG	Average±SD	% AKG	Average±SD	% AKG
Energy (kkal)	401.5±75.5	15.4	338.3±68.0	15.3	380.4±78.2	15.7
Protein (g)	14.2±3.6	21.8	11.4±3.0	19.0	13.3±3.6	20.9

Table 3 indicates the amount of energy and protein contribution from breakfast. Sixteen male workers (61.5%) had sufficient energy intake from breakfast, whereas the other 10 persons (38.5%) had insufficient energy intake from breakfast, or 15% of the eating habits adequacy rate (RDA). For female workers, the proportion of nutritional intake from breakfast (53.8%) was sufficient for energy intake from breakfast, while the remaining (46.2%) was insufficient for energy intake from breakfast. Most protein intake contributions were adequate, as many as (88.5%) male workers and (76.9%) female workers had sufficient protein intake from breakfast, but (7.7%) male workers, (23.2%)%) female workers did not meet their protein intake from breakfast, and one male worker (3.8%) exceeded the adequate protein intake from breakfast.

Table 3. Energy and protein contribution levels based on percent (RDA)

Nutrients	Male n (%)			Female n (%)		
	<15% AKG	15-30% AKG	>30%AKG	<15% AKG	15-30% AKG	>30%AKG
Energy (kkal)	10 (38.5)	16 (61.5)	0 (0.0)	6 (46.2)	7 (53.8)	0 (0.0)
Protein (g)	2 (7.7)	23 (88.5)	1 (3.8)	3 (23.1)	10 (76.9)	0 (0.0)

Table 4 reveals that at PT. Sejahtera Buana Trada Sunter, there were 17 workers with good nutritional status and high productivity (94.4%), and a single worker with good nutritional status and low productivity (5.6%).

Workers that were deficient in nutrition are less productive (100%). There were 11 workers with a good nutritional status (57.9%) and 8 workers with a low nutritional level (42.1%). In this study, workers with good nutritional status had higher productivity than workers with poor nutritional status, whereas those with poor nutritional status had lower productivity overall. According to this study, there were workers with high nutritional status but low productivity. It is hypothesized that there are additional variables influencing productivity, such as workers getting less sleep and not eating breakfast. Similar to the preceding scenario, workers with higher nutritional status yet high productivity are considered to be impacted by other factors, such as workers who get enough sleep and are habituated to eating breakfast. The findings of nutritional status and worker productivity cross tabulation using the chi-square statistical test demonstrated an important correlation ($p<0.05$) between nutritional status and workers productivity at PT. Sejahtera Buana Trada Sunter.

According to Fitri et al.'s research, there is a link between worker work productivity and nutritional status[12]. Nutritional status is linked to work productivity, thus nutritional status elements must be taken into account. Nutritional status is linked to body resilience and health, so it can impact work productivity[13]. The nutritional status of a person is determined by his or her daily food intake [4]. Occupational nutrition is critical for achieving the optimum level of health, especially for workers[14]. As stated by Novianti et al., there is a correlation between nutritional status and work productivity of assembly line operators at PT. X[15]. The better a person's nutritional state, the more productive they will be at work[16]. Nutritional status has an impact on productivity in the short, medium, and long run [17].

The fundamental cause of overnutrition is an energy imbalance between calories in and calories out. This can also be attributed to increased consumption of fatty foods and sugar, as well as decreased physical activity as a result of varied sorts of work, changes in means of transportation, and a growth in urban population[18]. Leptin is a hormone that contributes to obesity. The amount of leptin discovered in serum derived from adipose tissue shows how much fat is stored in the body. Obesity can result from excessive eating habits if there is a leptin problem. Leptin operates as a metabolic hormone by decreasing hunger and boosting calorie expenditure through a negative feedback mechanism[19]. A combination of environmental and genetic factors, such as physical activity, socioeconomics, lifestyle and eating behavior, is the main cause of obesity[20].

Obesity is directly linked to the eating of snacks at main meal times, late night meals, a lack of physical exercise, and a high consumption of fast food and alcohol[21]. Malnutrition in adulthood can have a variety of consequences. If a person is deficient in nutrients that operate as a source of energy, the energy utilized to work, move, and carry out tasks will diminish, resulting in a person feeling lethargic, fatigued, and their productivity will decline[4]. Workers with nutritional status are slower and less agile at work because it takes more energy to move their bodies, reducing productivity, whereas workers with normal body weight are more active and dexterous at work, increasing productivity[15]. Employee health issues must be taken into account since they might have an impact on a person's physical fitness as well as mental ability to work more attentively, comprehensively, and productively[13].

Table 4 demonstrates that 21 workers (91.3%) at PT. Sejahtera Buana Trada Sunter were used to high productivity breakfasts, whereas the other 2 workers (8.7%) were used to poor productivity breakfasts. 7 (43.8%) were not used to eating a high productivity breakfast, whereas 9 (56.3%) were not used to eating a low productivity breakfast. The cross tabulation findings between breakfast habits and worker productivity revealed a significant value of 0.003 ($p<0.05$), indicating that there was a relationship between breakfast habits and worker productivity at PT. Sejahtera Buana Trada Sunter. Breakfast has a positive influence on a person, beginning with decreased stress levels, excellent focus levels at work, fewer accident rates at work, and good productivity[22]. Breakfast consumption is positively correlated with the academic achievement of healthy male and female adolescents in Korea [23].

Developing the practice of eating breakfast might help you prevent binge eating, which can lead to weight gain[6]. According to Iswari, there is a significant relationship between breakfast habits and work productivity [16]. Having breakfast before work has important benefits on work productivity[16]. According to the findings of Hikmah's research, 9 persons (69.2%) are not used to eating breakfast and are not productive, indicating a connection between breakfast habits and the work productivity of Astra World Juanda, Central Jakarta employees[24].

According to Table 1, the majority of workers (59.0%) had breakfast on a regular basis, while 41.0% did not. There were 9 persons (56.3%) who were not used to having breakfast with poor productivity and 3 people (13.0%) who were. According to this study, some workers were less productive even when they were accustomed to having breakfast. Possible factors include workers' poor nutritional state and a lack of sleep. Other study indicates that breakfast is one of the elements influencing worker productivity. Furthermore, continuously adopting breakfast routines can enhance productivity, which benefits both employees and the firm[25].

Table 3 illustrates the level of contribution of nutritious intake acquired from breakfast. Breakfast provided appropriate energy intake to 16 male workers (61.5%) and 7 female workers (53.8%). A total of (88.5%) male workers and (76.9%) female workers consumed enough protein from breakfast; nevertheless, (7.7%) male workers and (23.2%) female workers did not consume enough protein. protein from breakfast, and one male worker (3.8%) consumed more protein than was recommended. meal, especially a protein-rich meal, generally fills the stomach again, raises blood sugar levels, and stimulates physical activity after 8-10 hours of fasting[26].

Based on this research, most workers consumed breakfast before 08.00 in the morning (28.2%), workers ate breakfast after arriving at the office, and the majority

Amerta Nutrition

e-ISSN: 2580-1163 (Online)
p-ISSN: 2580-9776 (Print)
Wiguna and Stefani | Amerta Nutrition Vol. 7 Issue 2SP (December 2023). 205-212

209

got food (64.1%) from buying at food stalls or restaurants, besides that (30 .8%) workers had breakfast after 9.00 am, this is no longer a good time for breakfast. A healthy breakfast can be had until 09.00[5]. Breakfast is an eating and drinking activity occurring between the hours of waking up and 9 a.m[6]. The factors most frequently mentioned by workers in this study for skipping breakfast were not having time (48.7%), laziness (17.9%) and unavailability of food (17.9%). According to research by Niswah et al., the two most common reasons for not having breakfast are having no appetite (30.0%) and not having time (26.6%)[27]. Employees at PT. Sejahtera Buana Trada experienced changes in breakfast habits for the better after the Covid-19 pandemic or as many as (56.6%).

After keeping breakfast food records for 7 days, the results showed that the majority of workers (52.1%) only consumed staple foods (rice, porridge, noodles, and bread) and side dishes (animal protein and/or vegetable protein), workers who consumed staple foods, side dishes, and vegetables (30.9%), staple foods, side dishes, and fruit (3.6%), staple foods, side dishes, vegetables and fruit (2.6%), and staple foods, side dishes, vegetables and fruit (2.6%). According to the frequency distribution of breakfast kinds, most workers seldom consume vegetables or fruit. A fiber-rich breakfast can help reduce blood cholesterol, which can help avoid heart disease caused by oxidized fat deposits in the blood arteries.[6].

Someone who eats breakfast improves focus; also, breakfast is associated with improved performance[28]. Breakfast habits can help someone who is overweight manage their weight[29]. Teenagers who eat breakfast have better concentration than teenagers who don't eat breakfast[30]. Breakfast increases a person's work efficiency and productivity, as they are able to complete their responsibilities or assignments more rapidly and accomplish more[31].

Sleep is an important passive activity for human physical and mental wellbeing. Millions of individuals worldwide continue to suffer from various sleep disorders or do not get enough sleep[32]. A factor that influences sleep quality is sleep duration [33]. According to the findings of this study, some workers had good sleep length and great productivity, while others had less sleep duration but higher output, which was assumed to be impacted by other factors such as breakfast habits and nutritional status. For the association between sleep duration and work productivity at PT Sejahtera Buana Trada Sunter, the cross tabulation findings revealed a significant value of 0.004 (p<0.05).

Table 4 shows that at PT. Sejahtera Buana Trada Sunter, workers with good sleep duration had high productivity as many as 20 people (90.9%), while workers with poor sleep duration had high productivity as many as 8 people (47.1%). Based on this, workers with less sleep duration were able to affect work performance, resulting in low productivity. This study supports Juliana's findings that there is a substantial association between sleep length and work productivity[33]. Sleep deprivation has long been associated with substantial health hazards, and this study adds to the growing body of data demonstrating that sleep deprivation is connected with decreased productivity[34]. Ishibashi and Shimura found that there was a significant relationship between sleep duration and work productivity[35].

The majority of the workers in this survey slept for an average of 7 hours each day. 11 male workers (42.3%) had bad sleep duration, whereas 15 persons (57.7%) had acceptable sleep length, with the exception of 6 female workers (46.2%). The remaining 7 persons (53.8%) had enough sleep duration. The average worker had irregular sleeping hours, and the majority of people needed more than 15 minutes to fall asleep after resting in bed. The majority (47.1%) of workers reported reduced sleep duration as a result of using electronics or playing games before bed. Using electronic gadgets before going to bed has been linked to sleeplessness[36]. The use of electronic devices or gadgets for reading, communication, and amusement before bed increases the amount of time it takes to fall asleep[37]. There is a significant correlation between social media use and the incidence of insomnia in nursing students[38]. The usage of electronic gadgets is connected to teens' sleep quality at SMA Negeri 1 Srandakan Bantul. People's sleep quality deteriorates when they utilize electronic gadgets more frequently[39].

According to this study, 78.8% of workers did not smoke, drank coffee, or consumed alcohol 2 hours before bed, and the majority of workers (89.7%) did not exercise before bed, resulting in workers' sleep duration being better. According to the Indonesian Ministry of Health, avoid caffeine-containing foods or drinks after lunch since caffeine might interfere with sleep[40]. It is advised not to smoke or consume alcohol two hours before going to bed since it might act as a stimulant to the nerve center, making sleep harder. Exercise close to bedtime is not suggested since the body is not yet relaxed, causing trouble sleeping.

Table 4. Results of analysis of the relationship between nutritional status, breakfast habits, sleep duration and worker productivity at PT. Sejahtera Buana Trada Sunter

Variable	Work Productivity				p-value
	Low Productivity		High Productivity		
	n	%	n	%	
Nutritional Status					
Less	2	100.0	0	0.0	
Excess	8	42.1	11	57.9	0.002
Good	1	5.6	17	94.4	
Total	11	28.2	28	71.8	
Breakfast Habit					

e-ISSN: 2580-1163 (Online)
p-ISSN: 2580-9776 (Print)
Wiguna and Stefani | Amerta Nutrition Vol. 7 Issue 2SP (December 2023). 205-212

210

Variable	Work Productivity				p-value
	Low Productivity		High Productivity		
	n	%	n	%	
Irregularly having breakfast (<4x/week)	9	56.3	7	43.8	0.003
Regularly having breakfast (≥4x/week)	2	8.7	21	91.3	
Total	11	28.2	28	71.8	
Sleep Duration					
Poorly (<7 jam/hari)	9	52.9	8	47.1	0.004
Good (≥7 jam/hari)	2	9.1	20	90.9	
Total	12	28.2	28	71.8	

CONCLUSIONS

The study's findings revealed that dietary status, breakfast routines, and sleep length all had an impact on Pworkers' productivity at Sejahtera Buana Trada Sunter. Workers with low or high nutritional status can live a healthy lifestyle by following balanced dietary standards, exercising regularly, and limiting their intake of sweets and fatty foods. Workers with normal nutritional status retain their health and try to improve every day.

Workers are encouraged to restrict their use of electronics and games at night, create a sleep plan, and attempt to sleep early if there is no activity, so that they have enough sleep. In partnership with nutrition, health students, and associated agencies/institutions, PT. Sejahtera Buana Trada can carry out routine monitoring of employee nutritional status, give nutritional education or advice regarding balanced nutrition, breakfast, or sleep length. Routine monitoring and education/counseling can be used for corporate evaluation in order to boost staff productivity.

Future studies should be able to compare calorie and nutritional consumption, physical activity, and other variables that may be associated to this study variable.

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