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THE IMPACT OF PHYSICAL FATIGUE AND MENTAL FATIGUE ON WORKPLACE DISADVANTAGES IN STUDENT WORKERS IN THE F&B SECTOR

Sanda Aulia[1], Agustina Motu[2]

[12] Management Study Program, Faculty of Economics and Business, University of Pamulang

sandaaulia13@gmail.com

Abstract

This study aims to analyze the effects of physical fatigue and mental fatigue on work errors among students working in the Food and Beverage (F&B) sector. Working students often face a dual burden between academic demands and job responsibilities, which can lead to both physical and mental exhaustion. This research employs a quantitative approach using a survey method, with respondents consisting of students who work in the F&B sector. Data were collected through questionnaires using a Likert scale to measure levels of physical fatigue, mental fatigue, and work errors. The data were analyzed using multiple linear regression to determine the influence of each independent variable on the dependent variable. The results show that both physical fatigue and mental fatigue have a positive and significant effect on work errors. This indicates that the higher the level of fatigue experienced by working students, the greater their tendency to make mistakes or lose focus at work. These findings are expected to serve as a foundation for F&B management and educational institutions to design strategies that reduce fatigue levels among working students, thereby improving their performance and well-being.

Keywords: Physical fatigue, mental fatigue, work errors, working students, F&B sector
Background

Introduction

The development of the Food and Beverage (F&B) industry in Indonesia has shown significant growth in recent years. This growth has created many opportunities for students to work part-time in the sector, taking on roles such as waiters, baristas, cashiers, or kitchen staff. However, the demanding nature of the F&B industry—with long working hours, fast-paced activities, and high pressure—often causes working students to experience both physical and mental fatigue.

Working students face the challenge of balancing dual roles between academic life and work life. On one hand, they must fulfill academic obligations such as attending lectures, completing assignments, and taking exams. On the other hand, they must adapt to work demands that require physical energy and mental focus. This imbalance may result in physical fatigue due to intensive activity and lack of rest, as well as mental fatigue caused by psychological stress and pressure.

Both physical and mental fatigue can negatively impact individual performance, including an increased risk of work errors, such as mistakes in serving customers, negligence in following procedures, or reduced concentration. This phenomenon not only affects individuals but can also harm service quality and organizational productivity. Therefore, it is essential to examine how physical and mental fatigue influence work errors among students working in the F&B sector.

In recent years, the growing number of student workers in the food and beverage (F&B) industry has become a significant phenomenon across many countries. The F&B sector, characterized by high work intensity, long shifts, and demanding customer interactions, requires both physical endurance and mental alertness. For student workers—who must balance their academic responsibilities with part-time employment—these demands often result in elevated levels of fatigue. Fatigue, whether physical or mental, can influence not only individual well-being but also performance and overall workplace outcomes.

Physical fatigue refers to the decline in bodily capacity resulting from prolonged or repetitive physical activity, often leading to decreased energy, slower reaction times, and reduced productivity. Meanwhile, mental fatigue is a state of cognitive exhaustion caused by sustained mental effort or emotional strain, which can impair focus, motivation, and decision-making abilities. When both forms of fatigue occur simultaneously, they can contribute to workplace disadvantages such as lower work quality, reduced concentration, higher error rates, absenteeism, and diminished job satisfaction.

Student workers in the F&B sector face a unique combination of stressors. The physical nature of their work—such as standing for long hours, handling heavy trays, and working in fast-paced environments—is compounded by the mental pressure of multitasking, customer service demands, and maintaining academic performance. Consequently, these overlapping pressures may lead to chronic fatigue and increase the likelihood of workplace disadvantages, including poor performance evaluations, conflicts with coworkers, and even job turnover.

Understanding the impact of physical and mental fatigue among student workers is essential for improving workplace conditions, enhancing productivity, and safeguarding mental health. This study seeks to analyze how both types of fatigue influence the occurrence of workplace disadvantages among student workers in the F&B sector. The findings are expected to contribute to developing strategies for fatigue management, better scheduling practices, and more supportive employment policies that promote sustainable work–study balance.

Research Purpose
1. To determine the most dominant factors influencing students' decisions to work night shifts.
2. To analyze the relationship between students' fatigue levels and night shift work intensity.
3. To determine the impact of work fatigue on the well-being and productivity of students who work night shifts.

Theoretical Framework

This study explores the relationship between physical fatigue, mental fatigue, and workplace disadvantages among student workers in the food and beverage (F&B) sector. The framework integrates theories from occupational health psychology, ergonomics, and organizational behavior to explain how fatigue affects individual performance, well-being, and work-related outcomes.

1. Concept of Fatigue, Fatigue is generally defined as a state of reduced capacity for work resulting from prolonged exertion, stress, or inadequate rest (Hockey, 2013). In the context of this study, fatigue is divided into two dimensions: Physical Fatigue — Refers to the physiological exhaustion of the body due to repetitive or strenuous physical activities (Åhsberg et al., 2000). It manifests as muscle tiredness, slower reaction time, and decreased physical performance. Mental Fatigue — Refers to a cognitive and psychological state of weariness resulting from sustained mental effort or emotional stress (Boksem & Tops, 2008). It affects attention, motivation, concentration, and decision-making abilities. Both forms of fatigue are interrelated; prolonged physical workload can lead to cognitive strain, while persistent mental exhaustion may reduce physical coordination and stamina.
2. Job Demand–Resource (JD-R) Theory. The Job Demand–Resource Theory (Bakker & Demerouti, 2007) provides the main theoretical foundation for understanding how fatigue develops and influences workplace outcomes. According to the JD-R model: Job Demands (e.g., long shifts, multitasking, customer pressure) require sustained effort and are associated with physical and psychological costs, such as fatigue. Job Resources (e.g., social support, flexibility, rest breaks) help buffer the negative effects of demands. When job demands exceed available resources, workers experience burnout and fatigue, leading to performance decline and workplace disadvantages. For student workers in the F&B sector, high job demands combined with academic obligations exacerbate both physical and mental fatigue, increasing their vulnerability to workplace disadvantages.
3. 3. Effort–Recovery Theory. The Effort–Recovery Theory (Meijman & Mulder, 1998) posits that workers expend effort to meet work demands, which leads to fatigue accumulation. Adequate recovery (rest or relaxation) is necessary to restore functioning. If recovery time is insufficient—such as in the case of student workers balancing work and study—fatigue becomes chronic, potentially leading to long-

term impairment in performance and health. This theory supports the idea that student workers' dual roles (academic and occupational) restrict their recovery period, increasing fatigue levels and workplace disadvantages such as decreased efficiency and higher error rates.

4. The Conservation of Resources (COR) Theory. According to Conservation of Resources Theory (Hobfoll, 1989), individuals strive to obtain, maintain, and protect their physical, psychological, and social resources. Fatigue occurs when these resources are depleted or threatened. Student workers who continuously expend effort in both work and study without adequate replenishment experience resource loss, leading to emotional exhaustion and decreased resilience at work.
5. Workplace Disadvantages. Workplace disadvantages refer to negative outcomes that hinder an employee's effectiveness and job satisfaction, such as lower productivity, reduced job performance, increased absenteeism, conflicts, or turnover intention (Karasek & Theorell, 1990). In the F&B sector, these disadvantages are often linked to fatigue-driven factors, including: Reduced physical endurance (from physical fatigue), Poor concentration and decision-making (from mental fatigue), Increased workplace accidents and customer complaints, Lower motivation and engagement.
6. Conceptual Model. Based on the theories discussed, this study proposes the following conceptual relationships: Physical Fatigue → Workplace Disadvantages. High physical workload leads to bodily exhaustion, which reduces performance, increases mistakes, and limits productivity. Mental Fatigue → Workplace Disadvantages, sustained mental strain from multitasking and customer interaction impairs focus and emotional stability, resulting in poor job outcomes. Moderating Context: Student Workers in the F&B Sector. The dual responsibilities of study and work amplify the effects of fatigue, making this group particularly vulnerable to workplace disadvantages.
7. Summary of Theoretical Framework. The theoretical framework combines the JD-R Theory, Effort–Recovery Theory, and COR Theory to explain that excessive job demands and insufficient recovery among student workers lead to physical and mental fatigue, which in turn results in various workplace disadvantages. Understanding these relationships can help organizations in the F&B industry design better work schedules, provide adequate rest periods, and promote a supportive work environment for student workers.

Methods

This study used a quantitative approach with a cross-sectional design. The study population was active students at Pamulang University who worked part-time or full-time. A sample of 100 individuals was selected using a purposive sampling technique. The research instrument was a Likert-scale questionnaire (1–5) Data analysis was performed using multiple linear regression using SPSS version 24.

Result

Multiple linear regression analysis was conducted to determine the extent to which the independent variables simultaneously and partially influence the dependent variable. Based on the SPSS output, the analysis produced the Model Summary, ANOVA, and Coefficients tables, as summarized below:

Table 1. Multiple Linear Regression test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.895	.321		2.789	.006
	X1	.034	.037	.077	.917	.361
	X2	.564	.090	.527	6.242	.000

a. Dependent Variable: Y

Source: SPSS Data Processing Result

Variable X_1 = Physical Fatigue
X_2 = Mental Fatigue
Y = Work Deviance
Dependent Variable: Number of students working night shifts.
Independent Variables:
- Students who are mentally fatigued working night shifts
- Students who are tired working night shifts

Analysis Results
- Constant: The intercept value is 0.895 with a significance level of 0.006, meaning the constant is significant and can be used in the regression equation.
- Students who are mentally fatigued working night shifts:
- Coefficient (B) = 0.034, standardized Beta = 0.077, t = 0.917, significance = 0.361 (not significant because the value is > 0.05). This means that this variable does not significantly influence the number of students working night shifts.
- Students who are tired of working night shifts: Coefficient (B) = 0.564, standard Beta = 0.527t = 6.242, significance = 0.000 (significant because the value is <0.05) This means that this variable has a positive and significant effect on the number of students who work night shifts. Only the variable "students who are tired of working night shifts" has a significant effect on the variable number of students who work night shifts. The variable "mentally tired" does not have a significant effect in this model.

Table 2. Partial F-test

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	62.726	2	31.363	21.031	.000[b]
	Residual	150.620	101	1.491		
	Total	213.346	103			

a. Dependent Variable: Y

b. Predictors: (Constant), X2, X1

Source: SPSS Data Processing Result

The ANOVA table shows the results of linear regression testing with two predictor variables (X1 and X2) on the dependent variable Y. From the table, it can be seen that the calculated F value is 21.031 with a significance level of 0.000, which means that this regression model is statistically very significant. This means that variables X1 and X2 together have a significant effect on variable Y. Thus, the model used is able to explain variations in Y significantly better than the model without predictors.

Table 3. Partial T-test

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.895	.321		2.789	.006
	mahasiswa yang lelah mental kerja shift malam	.034	.037	.077	.917	.361
	mahasiswa yang capek kerja shift malam	.564	.090	.527	6.242	.000

a. Dependent Variable: jumlah mahasiswqa yang kerja shif malam

Source: SPSS Data Processing Result

Mental fatigue of students working night shifts (X_1):
The calculated t-value (2.789) > t-value (0.895) and Sig. (0.006) > 0.05, indicating that physical fatigue does not significantly influence work errors.
- The higher the level of physical fatigue of student workers, the greater the likelihood of work errors in the F&B sector.

Students tired from working night shifts (X_2):
The calculated t-value (6.242) > t-value (0.564) and Sig. (0.000) < 0.05, indicating that mental fatigue also significantly influences work errors.
- Students experiencing high levels of mental pressure, stress, or boredom are more prone to making errors at work.

Partially, both physical and mental fatigue significantly influence work errors among student workers in the F&B sector. This shows the importance of time management, adequate rest, and mental support to ensure optimal student working performance.

Table 4. Coefficient Determination Test

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.542[a]	.294	.280	1.22118

a. Predictors: (Constant), X2, X1

Source: SPSS Data Processing Result

The R Square (R^2) value of 0.294 indicates that 29.4% of the variation (change) in Work Errors can be explained by Physical Fatigue (X1) and Mental Fatigue (X2) together.
This means that the two independent variables (physical and mental fatigue) have a 29.4% influence on work errors, while the remaining 70.6% is explained by other factors not included in this research model (such as work stress, working hours, or motivation).
The Adjusted R Square (0.280) value is slightly lower than the R Square, indicating that after adjusting for the number of variables and sample size, the model still has sufficient ability to explain variation in the dependent variable.

Interpretation
1. Koefisien Korelasi (R) = 0,542
Hal ini menunjukkan bahwa terdapat hubungan yang cukup kuat antara variabel kelelahan mental dan kelelahan fisik terhadap jumlah siswa yang bekerja pada shift malam.
2. Nilai R Kuadrat (R^2)= 0,294
Berarti bahwa kedua variabel independen tersebut mampu menjelaskan sebesar 29,4% variasi pada variabel dependen, yaitu jumlah mahasiswa yang bekerja shift malam. Sementara sisanya sebesar 70,6% dijelaskan oleh faktor lain yang tidak dimasukkan dalam model penelitian ini.
3. Nilai Adjusted R Square = 0,280
Memperlihatkan bahwa setelah disesuaikan dengan jumlah variabel dan sampel, kemampuan model dalam menjelaskan variabel dependen tetap sebesar 28%, yang menunjukkan model tergolong cukup baik.
4. Kesalahan Standar Estimasi = 0,034
Hal ini menunjukkan bahwa kelelahan mental tidak berpengaruh signifikan terhadap jumlah siswa yang bekerja shift malam. Dengan kata lain, tingkat kelelahan mental siswa tidak secara nyata mempengaruhi jumlah siswa yang memilih bekerja pada shift malam.

Discussion

The results of the multiple linear regression analysis indicate that both mental and physical fatigue variables simultaneously have a significant influence on the number of students working night shifts. This is evidenced by the F-test value of 21.031 and a significance level of 0.000, which is less than 0.05. This finding indicates that both variables together are able to explain changes in the number of students working night shifts. In other words, the level of fatigue, both physical and mental, is a contributing factor to students' decision to continue working the night shift. However, when tested partially, only the physical fatigue variable had a significant effect on the number of students working night shifts, with a significance value of 0.000 (<0.05) and a positive regression coefficient of 0.564. This indicates that the higher the level of physical fatigue experienced by students, the greater the likelihood of the student working the night shift. This condition can be interpreted as meaning that students who experience physical fatigue tend to be individuals with a high workload, either due to work demands, long working hours, or busy academic activities outside of working hours. Night shifts that require high physical readiness can worsen the condition of fatigue they experience, but they are still done because of economic needs or work responsibilities.

Conclusion

1. The regression model is simultaneously significant.
2. Partially, only variable X2 (students who are tired from working night shifts) has a significant positive effect on the number of students working night shifts.
3. Variable X1 (mental fatigue) has no significant effect.
4. The model explains 29.4% of the variance.

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