

Factors Influencing Workplace Accidents and the Performance of Koja Regional Hospital, North Jakarta

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ABSTRACT

Hospitals can be dangerous for patients and their caregivers, including doctors, nurses, technicians, and those involved in hospital management and patient care. Objective: To analyze the factors, the most dominant factors and the implementation of the K3 program that affect work accidents and the performance of nutrition employees in the nutrition installation of Koja Regional Hospital, North Jakarta in 2024. Results: Based on the results of the statistical calculation of the F test, the t-count value was 15.220. After that, it was compared with the t-table value of 2.76 with a significance of 5% (0.05). So it can be concluded that $t\text{-count} > t\text{-table}$ ($15.220 > 2.76$) with a sig F of $0.000 < 0.05$, this means that the human variables (X1), equipment (X2), ergonomics (X3), chemistry (X4), environment (X5), technical or infrastructure (X6), administrative (X7), management (X8), K3 program (X9) simultaneously have a positive and significant effect on work accidents (Y). Conclusion : Based on the analysis of multiple regression models, several factors that influence work accidents and the performance of nutrition employees at the nutrition installation of Koja Regional Hospital, North Jakarta can be seen from the coefficients and levels of significance of each factor. Suggestion: Continue to optimize the implementation of K3 programs in the nutrition installation, with a focus on improving training and counseling related to work safety for all employees.

INTRODUCTION

Occupational Health and Safety (OHS) is one of the most critical aspects in creating a safe, healthy, and environmentally sustainable workplace. Effective OHS implementation protects workers from occupational accidents, which in turn enhances productivity and work efficiency (Lestantyo et al., 2020).

According to Law of the Republic of Indonesia No. 17 of 2023, the objective of workplace health programs is to protect workers so that they can live healthy lives and remain free from occupational accidents in the workplace.

Hospitals can pose hazards not only to patients but also to caregivers, including doctors, nurses, technicians, and personnel involved in hospital management and patient care. In addition to infectious diseases, hospitals present various other potential hazards such as accidents (explosions, fires, electrical-related incidents, and other sources of injury), radiation exposure, chemical toxic substances, anesthetic gases, as well as psychosocial and ergonomic disorders. All of these potential hazards pose serious risks to the lives of hospital staff, patients, and visitors (Efendy, 2022).

Furthermore, hospitals represent high-risk healthcare service environments that expose workers to occupational diseases, work-related accidents, job stress, and even occupational injuries. Therefore, hospitals must prioritize the implementation of Occupational Health and Safety Management Systems and Hospital Occupational Health and Safety (SMK3 and K3RS). These efforts are essential to minimize the risk of occupational accidents (Kurniati & Novita Indri, 2024).

Data from the International Labour Organization (ILO, 2018) indicate that approximately 6,000 fatal occupational accidents occur globally each day. In Indonesia, occupational accidents affect workers daily, with approximately 380,000 workers—representing 13.7% of the 2.78 million global occupational fatalities—dying each year due to work-related accidents.

Based on data on occupational accidents and occupational diseases from the Work Accident Insurance Program (JKK) of BPJS Employment in 2023, there has been a slight annual increase in the number of cases. In 2022, a total of 234,370 occupational accident cases were recorded, resulting in 6,552 worker fatalities—an increase of approximately 5.7% compared to 2021. These figures indicate that the implementation of OHS is increasingly crucial in Indonesia's workforce. In response to these alarming statistics, the implementation of Occupational Health and Safety must be strengthened to protect workers and others in the workplace, safeguard company assets, and protect the community and environment, as mandated by Law No. 1 of 1970 (Ministry of Manpower of the Republic of Indonesia, 2023).

The Jakarta Regional Office reported that from January to March 2022, there were 61,805 occupational accident cases, the majority of which involved workers aged 20–25 years (BPJS Employment, 2022).

Based on observations and interviews with the OHS and Environmental Health and Safety Unit (K3KL) at RSUD Koja, North Jakarta (2024), the authors obtained information indicating that work-related stress in the Nutrition Installation was relatively low. This finding was supported by statements from

the Human Resources and Occupational Health Division of RSUD Koja, which identified several contributing factors, including:

- Human factors: knowledge, length of employment, working hours, education level, perception, age, type of work, gender, compliance with personal protective equipment (PPE), work stress, marital status, and employee fatigue.
- Environmental factors: room temperature, cleanliness, slippery floors, lighting, smoke, vapor, mist, vibration, radiation, and noise.
- Equipment factors: equipment condition, placement, operation, and type of equipment.
- Technical or infrastructure factors: building conditions, work methods, work patterns, work processes, unsuitable workplaces, and alarm systems.
- Administrative factors: availability of PPE, job type, duration of work, and working hours.
- Ergonomic factors: posture, behavior, and working style.
- Chemical factors: exposure to gases, oils, and other chemical substances.
- Management factors: supervision, guidance, OHS promotion, compliance with Standard Operating Procedures (SOPs), OHS training, and evaluation of OHS implementation.

This study focuses on occupational accidents occurring in the Nutrition Installation of RSUD Koja. Despite existing OHS measures, occupational accident cases among hospital nutrition staff continue to occur. Based on interviews with the Human Resources Department, OHS officers, unit heads, and nutrition staff during the 2023–2024 period, it was observed that cases of occupational diseases and work-related accidents increased in 2024 compared to 2023.

Considering the issues described above, this study aims to examine the factors influencing occupational accidents among nutrition staff at RSUD Koja, North Jakarta, in 2024. The ultimate objective of this research is to identify factors that negatively influence occupational accidents in the workplace and to provide practical recommendations for the hospital's nutrition installation to reduce the risk of work-related accidents.

RESEARCH METHODS

This study employs a quantitative research approach using a survey method. Data were collected from respondents through structured questionnaires. Survey research is a quantitative method that uses systematic and structured questions administered to a large number of respondents, followed by statistical analysis and evaluation of all responses obtained from the research participants.

RESEARCH RESULTS

Table of Multiple Regression Analysis Results

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.012	.590		-.020	.984
	X1	.155	.158	.112	.980	.331
	X2	-.177	.244	-.092	-.726	.471
	X3	.292	.152	.214	1.919	.060
	X4	.623	.106	.608	5.892	.000
	X5	-.210	.133	-.155	-1.578	.120
	X6	.106	.162	.075	.657	.513
	X7	.227	.171	.151	1.330	.188
	X8	-.435	.180	-.280	-2.415	.019
	X9	.372	.199	.236	1.870	.066

Based on the SPSS output results in the table above, the multiple linear regression equation is as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + e$$

$$Y = -0,012 + 0,155 (X_1) - 0,177 (X_2) + 0,292 (X_3) + 0,623 (X_4) - 0,210 (X_5) + 0,106 (X_6) + 0,227 (X_7) - 0,435 (X_8) + 0,372 (X_9)$$

The interpretation of the multiple linear regression equation is as follows:

$$\beta_0 = -0,12$$

The constant value is -0.12, so this can be interpreted that if the variable X1, X2, X3, X4, X5, X6, X7, X8 and X9 is constant (does not change).

$$\beta_1 = 0,155 \text{ (positive value (+))}$$

The human variable (X1) affects work accidents and employee performance by 0.155, meaning that if the human variable (X1) increases by 0.155, work accidents and employee performance will decrease linearly by 0.155. Conversely, if the human variable (X1) decreases, there will be a decrease in work accidents and employee performance.

$$\beta_2 = -0,177 \text{ (negative value (-))}$$

Interpretation of Regression Coefficients

The regression results indicate that several independent variables significantly influence occupational accidents and employee performance, as reflected by their respective regression coefficients.

Equipment Variable (X2)

The equipment variable (X2) has a regression coefficient of $\beta_2 = -0.177$, indicating a negative relationship with occupational accidents and employee performance. This means that an improvement in equipment conditions leads to a linear decrease in occupational accidents and performance-related problems by 0.177 units. Conversely, a decline in equipment quality increases the risk of occupational accidents and negatively affects employee performance.

Ergonomic Variable (X3)

The ergonomic variable (X3) shows a coefficient of $\beta_3 = 0.292$, indicating a positive relationship. This implies that poor ergonomic conditions are associated with an increase in occupational accidents and reduced employee performance. Improvements in ergonomic practices are therefore essential to minimize workplace accidents and enhance performance.

Chemical Variable (X4)

The chemical exposure variable (X4) has a coefficient of $\beta_4 = 0.623$, suggesting a strong positive influence on occupational accidents and employee performance deterioration. Increased exposure to chemical hazards significantly raises the likelihood of accidents and negatively impacts employee performance. Thus, stricter chemical hazard control is necessary.

Environmental Variable (X5)

The environmental variable (X5) records a coefficient of $\beta_5 = -0.210$, indicating a negative relationship. Improved environmental conditions – such as lighting, temperature, cleanliness, and noise control – contribute to a reduction in occupational accidents and improved employee performance.

Technical Variable (X6)

The technical variable (X6) has a coefficient of $\beta_6 = 0.106$, indicating a positive relationship. This suggests that technical deficiencies in work processes, tools, or infrastructure increase occupational accident risks and negatively affect employee performance.

Administrative Variable (X7)

The administrative variable (X7) shows a coefficient of $\beta_7 = 0.227$, indicating that weaknesses in administrative aspects – such as work schedules, PPE availability, and job arrangements – contribute to increased occupational accidents and reduced employee performance.

Management Variable (X8)

The management variable (X8) has a coefficient of $\beta_8 = -0.435$, indicating a negative and relatively strong relationship. Improved management practices, including supervision, safety training, and enforcement of SOPs, significantly reduce occupational accidents and enhance employee performance.

Occupational Health and Safety Program Variable (X9)

The OHS program variable (X9) shows a coefficient of $\beta_9 = 0.372$, indicating that inadequate implementation of OHS programs increases accident risks. Strengthening OHS programs plays a crucial role in reducing occupational accidents and improving employee performance.

DISCUSSION

The Effect of Human Factors (X1), Equipment Factors (X2), Ergonomic Factors (X3), Chemical Factors (X4), Environmental Factors (X5), Technical/Infrastructure Factors (X6), Administrative Factors (X7), Management Factors (X8), and OHS Program Factors (X9) on Occupational Accidents (Y).

a) For the human factor variable, the calculated t-value is 0.269, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated > t-table

and the significance value is 0.789 (> 0.05), this indicates that individually the human factor variable (X1) has a negative effect on occupational accidents.

b) For the equipment factor variable, the calculated t-value is 0.696, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.489 (> 0.05), this indicates that individually the equipment factor variable (X2) has a negative effect on occupational accidents.

c) For the ergonomic factor variable, the calculated t-value is -0.653, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.516 (> 0.05), this indicates that individually the ergonomic factor variable (X3) has a negative effect on occupational accidents.

d) For the chemical factor variable, the calculated t-value is -0.484, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.400 (> 0.05), this indicates that individually the chemical factor variable (X4) has a negative effect on occupational accidents.

e) For the environmental factor variable, the calculated t-value is -0.750, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.456 (> 0.05), this indicates that individually the environmental factor variable (X5) has a negative effect on occupational accidents.

f) For the technical factor variable, the calculated t-value is 0.783, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.437 (> 0.05), this indicates that individually the technical factor variable (X6) has a negative effect on occupational accidents.

g) For the administrative factor variable, the calculated t-value is -0.524, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.602 (> 0.05), this indicates that individually the administrative factor variable (X7) has a negative effect on occupational accidents.

h) For the management factor variable, the calculated t-value is -0.109, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.914 (> 0.05), this indicates that individually the management factor variable (X8) has a negative effect on occupational accidents.

i) For the OHS program variable, the calculated t-value is -0.077, while the t-table value at a significance level of 0.05 (5%) is 2.76. Since t-calculated $>$ t-table and the significance value is 0.939 (> 0.05), this indicates that individually the OHS program variable (X9) has a negative effect on occupational accidents.

The Most Dominant Influencing Factors among Human Factors (X1), Equipment Factors (X2), Ergonomic Factors (X3), Chemical Factors (X4), Environmental Factors (X5), Technical/Infrastructure Factors (X6), Administrative Factors (X7), Management Factors (X8), and OHS Program Factors (X9) on Occupational Accidents (Y).

a) The results of the F-test statistical calculation show an F-calculated value of 15.220. This value is then compared with the F-table value of 2.76 at a

significance level of 5% (0.05). Therefore, it can be concluded that $F\text{-calculated} > F\text{-table}$ ($15.220 > 2.76$) with a significance value of $0.000 < 0.05$. This means that human factors (X1), equipment factors (X2), ergonomic factors (X3), chemical factors (X4), environmental factors (X5), technical/infrastructure factors (X6), administrative factors (X7), management factors (X8), and OHS program factors (X9) simultaneously have a positive and significant effect on occupational accidents (Y).

b) The factor that most strongly influences occupational accidents is the chemical factor, as indicated by the research results showing a t-value of 5.892 for variable X4. This value is higher than those of the other variables.

CONCLUSIONS

1. Based on the multiple regression model analysis, several factors influencing work accidents and the performance of nutrition staff in the nutrition installation of RSUD Koja, North Jakarta, can be identified through the coefficients and significance levels of each factor. Human, ergonomic, chemical, technical, administrative, and OHS (K3) program factors show a positive effect on work accidents. Meanwhile, equipment, environmental, and management factors show a negative effect, indicating that improvements in working conditions and the implementation of better procedures can reduce work accidents. Overall, improvements in factors such as equipment, environment, and management have the potential to enhance the performance of nutrition staff and reduce the risk of work accidents, with particular emphasis on improving work methods and technical aspects that can minimize potential hazards in the workplace.
2. The results of the statistical F-test calculation show an F-count value of 15.220. This value is then compared with the F-table value of 2.76 at a significance level of 5% (0.05). Thus, it can be concluded that $F\text{-count} > F\text{-table}$ ($15.220 > 2.76$) with a significance value of $0.000 < 0.05$. This indicates that human factors (X1), equipment factors (X2), ergonomic factors (X3), chemical factors (X4), environmental factors (X5), technical/infrastructure factors (X6), administrative factors (X7), management factors (X8), and OHS (K3) program factors (X9) simultaneously have a positive and significant effect on work accidents (Y).
3. The factor with the greatest influence on work accidents is the chemical factor, as indicated by the research result showing that the t-value for variable X4 is 5.892. This value is higher than that of the other variables.

RECOMMENDATIONS

To continuously optimize the implementation of the OHS (K3) program in the nutrition installation, it is recommended to focus on improving training and safety education for all employees. In addition, regular evaluations of chemical substances used in the work environment should be conducted to ensure that these factors do not pose risks to employee safety. Improving supportive work facilities and implementing safer chemical management

practices will further reduce the risk of work accidents and enhance employee performance, which will ultimately have a positive impact on productivity and service quality in the nutrition installation of RSUD Koja.

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