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Occupational Safety and Health Risk Assessment Among Office Employees at the Environmental Agency of Karawang Regency

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Abstract. *Office work environments are exposed to various occupational hazards that may affect occupational safety and health (OSH). This study aimed to identify workplace hazards, assess occupational risks using the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method, and analyze factors associated with OSH risk among office employees at the Environmental Agency of Karawang Regency, Indonesia. A quantitative cross-sectional study was conducted involving 63 employees selected through total sampling. Data were collected using HIRADC observations and structured questionnaires and analyzed using univariate analysis, Chi-square test, and binary logistic regression. The results identified 20 workplace hazards, consisting of 1 low-risk (5.0%), 14 medium-risk (70.0%), and 5 high-risk (25.0%) hazards. Bivariate analysis revealed that physical factors (p<0.001) and safety factors (p=0.001) were significantly associated with OSH risk levels. Multivariate analysis indicated that safety factors were the strongest predictor of OSH risk (OR=6.594; p=0.011), followed by physical factors (OR=4.786; p=0.029). Periodic implementation of HIRADC and strengthening of the Occupational Safety and Health Management System (OSHMS) based on ISO 45001:2018 are recommended to reduce occupational risks and improve workplace safety in office environments.*

Keywords: *HIRADC, Occupational Safety and Health, Office Workers, Logistic Regression, Occupational Risk*

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INTRODUCTION

Occupational Safety and Health (OSH) is a fundamental component in creating a safe, healthy, and productive work environment (Kavouras et al., 2022; Abramihin, 2025; Nenosaban et al., 2026; Génesis et al., 2022). Although OSH has traditionally been emphasized in industrial settings, office workplaces are also exposed to various occupational hazards that may affect employee health, safety, and organizational performance. These hazards include ergonomic risks associated with prolonged sitting and poorly designed workstations, physical hazards such as inadequate lighting and unsafe electrical installations, chemical and biological exposures, psychosocial stressors, and workplace security issues (Bejinariu et al., 2023). Failure to manage these hazards systematically may lead to occupational accidents, work-related illnesses, reduced productivity, absenteeism, and financial losses for organizations (Prasetyo, 2025). Furthermore, organizations with a strong safety climate and effective occupational safety management systems consistently demonstrate better safety performance, higher employee compliance, and lower accident rates (Karanikas et al., 2023).

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In Indonesia, occupational safety and health implementation is regulated through Law Number 1 of 1970 concerning Occupational Safety, Government Regulation Number 50 of 2012 regarding the Occupational Safety and Health Management System (SMK3), and the Minister of Manpower Regulation Number 5 of 2018 concerning Occupational Safety and Health in the Work Environment. These regulations require organizations, including government institutions, to systematically identify workplace hazards, assess occupational risks, and implement appropriate control measures to ensure a safe and healthy work environment. Recent evidence also indicates that effective implementation of occupational safety management systems significantly improves workplace risk prevention and organizational safety performance (Ricci et al., 2024).

The importance of strengthening OSH implementation is reflected in the increasing number of occupational accidents reported in Indonesia. According to BPJS Ketenagakerjaan (2023) 159,127 occupational accident cases involving salaried workers were recorded during the first semester of 2023. This figure demonstrates that occupational safety remains a major public health concern across various employment sectors, including government institutions. Therefore, organizations should adopt systematic risk management approaches to minimize occupational accidents and work-related diseases while supporting sustainable organizational performance.

Hazard Identification, Risk Assessment, and Determining Control (HIRADC) has become one of the most widely adopted methods for occupational risk management (Rahardja, 2023; Iqbal et al., 2021; Pratama et al., 2025; Haristama et al., 2023; Mawaddah et al., 2026; Gultom et al., 2025). The HIRADC approach provides a systematic framework for identifying workplace hazards, assessing the likelihood and severity of occupational risks, and determining appropriate control measures based on the hierarchy of controls (Putri et al., 2024). This approach is aligned with the requirements of ISO 45001:2018, which identifies hazard identification and risk assessment as core elements of an effective Occupational Safety and Health Management System (International Organization for Standardization [ISO], 2018). Moreover, recent systematic reviews have shown that implementation of ISO 45001 contributes to improved organizational performance, stronger safety culture, and continuous improvement of occupational safety practices (Seneviratne et al., 2023).

The Environmental Agency of Karawang Regency is a government institution employing 63 office workers responsible for administrative and public service activities. Preliminary observations identified several workplace hazards, including poorly organized electrical cables, uneven lighting conditions, non-ergonomic working postures, and inadequate management of workplace safety facilities. These conditions may increase the likelihood of occupational accidents and work-related health problems if appropriate preventive measures are not implemented. Furthermore, no comprehensive occupational risk assessment using the HIRADC approach has previously been conducted within this institution, resulting in limited evidence regarding occupational risk levels among office employees.

Previous studies have demonstrated that HIRADC is effective in identifying workplace hazards and prioritizing risk control measures in manufacturing, construction, and healthcare sectors (Riandini et al., 2022; Khayyirah, 2024). However, empirical evidence regarding the application of HIRADC in government office environments remains limited. In addition, most previous studies focused primarily on hazard identification without examining determinants of occupational risk using multivariable statistical analyses such as logistic regression. Consequently, further research is required to provide evidence-based recommendations for improving occupational safety and health management within public sector organizations.

Based on these considerations, this study aimed to identify occupational hazards using the HIRADC method, assess occupational safety and health risk levels among office employees, and analyze factors associated with occupational risk levels using binary logistic regression analysis. The findings are expected to support the implementation of SMK3 and ISO 45001:2018, provide evidence for developing risk control programs, and serve as a reference for improving occupational safety and health management in government office workplaces (Ramadhan et al., 2025). The hypothesis of this study is that workplace hazard characteristics, including ergonomic, physical, biological, chemical, psychosocial, and workplace safety factors, are significantly associated with occupational safety and health risk levels among office employees, and that the HIRADC method can effectively identify priority hazards requiring immediate risk control.

METHODS

This quantitative study employed an analytical observational design with a cross-sectional approach to examine occupational safety and health (OSH) risk factors among office employees at the Environmental Agency of Karawang Regency, West Java, Indonesia. The study was conducted between June 2025 and April 2026. The study integrated the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method as a complementary approach for identifying workplace hazards, assessing environmental risks, and determining appropriate control measures. Two units of analysis were applied. The first unit of analysis comprised workplace hazards identified through the HIRADC assessment, whereas the second unit comprised individual office employees who participated in the questionnaire-based assessment. The HIRADC findings were analyzed at the workplace hazard level, while employee-level data were used to examine the relationship between workplace risk factors and occupational risk. The study population consisted of all 63 office employees at the Environmental Agency of Karawang Regency. Total sampling was applied because the entire population was accessible during the study period. Eligible participants were employees working in administrative or office units who had worked for at least six months and were willing to participate by providing written informed consent. Employees who were on leave or absent during data collection and those who did not complete the questionnaire were excluded. All 63 eligible employees participated in the study and returned completed questionnaires.

The dependent variable was the employee-level occupational safety and health risk category, which was classified into low- and high-risk groups for statistical analysis. The independent variables consisted of six groups of workplace risk factors, namely ergonomic, physical, chemical, biological, psychosocial, and safety factors. These factors were assessed at the individual employee level using a structured questionnaire. The employee-level occupational risk category was analyzed separately from the risk categories generated through HIRADC. The HIRADC assessment classified identified workplace hazards into low-, medium-, and high-risk categories, whereas the employee-level analysis used a binary occupational risk outcome. Therefore, the HIRADC risk categories were not directly assigned to individual employees. Data were collected using workplace observations, structured questionnaires, and institutional documentation. A HIRADC observation checklist was used to identify work activities, hazard sources, potential consequences, likelihood, severity, risk levels, existing control measures, and recommended control measures. The structured questionnaire was used to assess the six groups of workplace risk factors and was developed based on hazards identified through HIRADC, the principles of ISO 45001:2018, and relevant literature concerning occupational safety and health in office environments. All questionnaire items were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). Institutional documentation was reviewed to obtain information regarding the number of employees, organizational structure, workplace conditions, and available occupational safety and health facilities. Before data collection, the questionnaire underwent validity testing using the Pearson Product–Moment correlation and reliability testing using Cronbach's alpha. Items were considered valid when the calculated correlation coefficient exceeded the critical correlation value, whereas a Cronbach's alpha value of $\geqslant 0.70$ was considered acceptable.

Hazard identification was conducted through direct observation of office activities and workplace conditions. Each activity was assessed to identify potential hazard sources, possible consequences, and existing control measures. The HIRADC assessment identified a total of 20 workplace hazards representing ergonomic, physical, chemical, biological, psychosocial, and safety factors. These hazards constituted the unit of analysis for the HIRADC component of the study. Risk assessment was performed by evaluating the likelihood (L) of a hazardous event occurring and the severity (S) of its potential consequences. The risk score was calculated using the equation Risk Score = Likelihood × Severity. Based on the HIRADC risk matrix applied in the study, each identified hazard was classified as low, medium, or high risk. These categories were used to describe workplace-level risks and were analyzed separately from the employee-level occupational risk outcome. Recommended control measures were developed according to the hierarchy of controls, including elimination, substitution, engineering controls, administrative controls, and personal protective equipment. Data collection was conducted in three stages. First, workplace observations were performed to identify potential hazards and assess environmental risks using the HIRADC method. Second, questionnaires were distributed to all eligible office employees to obtain information regarding the six groups of workplace risk factors and employee-level occupational risk. Third, the observation findings were verified through institutional documentation and brief interviews with respondents to confirm their consistency with actual workplace conditions.

Data were analyzed using IBM SPSS Statistics version 27. Descriptive statistics were used to summarize respondents' characteristics and the distribution of study variables. Frequencies and percentages were used for categorical variables, whereas means and standard deviations were calculated for numerical variables where appropriate. The HIRADC findings were analyzed descriptively at the workplace hazard level by presenting the identified hazards, risk scores, risk categories, and recommended control measures. Bivariate analysis was performed using the Chi-square test to examine the association between each workplace risk factor and the employee-level occupational risk category. A p-value of <0.05 was considered statistically significant. Multivariate analysis was performed using binary logistic regression to identify factors independently associated with occupational risk. Variables were selected for inclusion in the multivariate analysis based on the predefined criteria from the bivariate analysis. The final model was evaluated using the Omnibus Test of Model Coefficients, the Hosmer–Lemeshow test, model summary statistics, and classification accuracy.

The results were reported as regression coefficients, Odds Ratios (ORs), 95% Confidence Intervals (95% CIs), and p-values, with statistical significance established at $p<0.05$. This study received ethical approval from the Health Research Ethics Committee of the Faculty of Public Health, Universitas Muhammadiyah Jakarta, with the approval number to be added after issuance. All respondents received an explanation regarding the objectives and procedures of the study and provided written informed consent before participation. Participation was voluntary, and respondents had the right to withdraw at any time without consequences. The confidentiality and anonymity of respondents were maintained throughout the data collection, analysis, and reporting processes, and all collected data were used exclusively for research purposes.

RESULT AND DISCUSSION

A total of 63 office employees from the Environmental Agency of Karawang Regency participated in this study, resulting in a response rate of 100%. Table 1 presents the demographic characteristics of the respondents. Most participants were male (55.6%), while females accounted for 44.4%. The largest age group was 30–39 years (38.1%), followed by employees aged 40–49 years (30.2%). More than half of the respondents (55.6%) had worked for over five years. The relatively long working experience of most respondents suggests substantial familiarity with routine office activities and workplace conditions. Nevertheless, extended job tenure does not necessarily eliminate occupational risks because repeated exposure to suboptimal ergonomic conditions, prolonged computer use, visual strain, and organizational stressors may contribute to work-related health problems over time (AlMousa et al., 2022). Employee experience and perceptions of workplace safety may also influence hazard recognition and safety-related practices (Syed-Yahya et al., 2022).

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Table 1. Characteristics of Respondents

Characteristics	n	%
Gender		
Male	35	55.6
Female	28	44.4
Age (years)		
<30	10	15.9
30–39	24	38.1
40–49	19	30.2
≥50	10	15.9
Working Period		
0–1 year	3	4.8
1–3 years	12	19.0
3–5 years	13	20.6
>5 years	35	55.6

Hazard identification using the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method identified 20 potential hazards associated with office activities. Of these hazards, 14 (70.0%) were classified as medium risk, five (25.0%) as high risk, and one (5.0%) as low risk. The predominance of medium-risk hazards indicates that the office environment contains hazards requiring continuous monitoring and preventive control. However, the identification of five high-risk hazards indicates the need for priority interventions.

Hazard Identification Using HIRADC

Hazard identification using the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method identified 20 potential hazards associated with office activities. The identified hazards were grouped into six factors: ergonomic, physical, biological, chemical, psychosocial, and safety factors. Among the 20 potential hazards, 14 (70.0%) were classified as medium risk, five (25.0%) as high risk, and one (5.0%) as low risk.

Table 2. Summary of HIRADC Risk Assessment

Risk level	Number of potential hazards	%
Low	1	5.0
Medium	14	70.0
High	5	25.0
Total	**20**	**100**

The predominance of medium-risk hazards indicates that office activities still involve conditions requiring continuous monitoring and preventive control. The five high-risk hazards further indicate that several workplace conditions require priority attention. Although office environments generally have lower exposure to severe industrial hazards, occupational risks may still arise from the interaction between workplace conditions, work activities, and organizational factors (Alhashim et al., 2025; Fernandes & Pereira, 2016; Hofmann et al., 2017; Tamers et al., 20200.

Systematic hazard identification and risk assessment are important components of occupational safety management because they enable organizations to identify hazards, determine their level of risk, and establish appropriate control measures. ISO 45001 emphasizes the importance of systematic processes for identifying hazards and managing occupational safety and health risks within organizations (International Organization for Standardization [ISO], 2018). Risk assessment can also support organizations in determining which hazards should receive priority for intervention (Riandini et al., 2022; Pascarella et al., 2021; Elsawah et al., 2016; Adger et al., 2018; Rezvani et al., 2023). Similar evidence indicates that structured risk

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assessment facilitates the selection of appropriate engineering and administrative controls (Bejinariu et al., 2023)

The HIRADC findings therefore indicate that occupational safety management in an office environment should not focus solely on accident prevention. Preventive programs should also consider conditions that may produce cumulative health effects or increase the likelihood of workplace incidents. Continuous monitoring and periodic reassessment are particularly important because workplace conditions may change over time (Putri et al., 2024; Williams & Beck, 2018)

Distribution of Occupational Safety and Health Risk

At the employee level, 42 respondents (66.7%) were classified as having low occupational risk, whereas 21 respondents (33.3%) were categorized as having high occupational risk.

Table 3. Distribution of Occupational Safety and Health Risk Levels

Risk level	n	%
Low	42	66.7
High	21	33.3
Total	**63**	**100**

The findings indicate that most employees were classified in the low-risk category. Nevertheless, one-third of the respondents were classified as having high occupational risk. This proportion indicates that occupational hazards remain relevant among office employees and should continue to be addressed through systematic preventive measures.

Office employees may be exposed to several workplace conditions, including prolonged computer use, non-optimal workstation arrangements, inadequate physical workplace conditions, electrical hazards, and insufficient emergency preparedness. Sedentary work and workplace design can contribute to occupational health problems when exposure is prolonged and preventive measures are inadequate (Oakman et al., 2022). The International Labour Organization also emphasizes the importance of identifying and controlling occupational hazards across different work environments, including office-based workplaces (International Labour Organization, 2022).

Therefore, the relatively high proportion of employees classified as having low risk should not be interpreted as indicating that occupational safety management is unnecessary. Rather, preventive measures should be maintained to prevent existing low risks from developing into higher risks. Continuous hazard identification and risk control are important components of sustainable occupational safety management (Leka et al., 2023)

Bivariate Analysis

Bivariate analysis was performed using the Chi-square test to examine the association between each workplace risk factor and occupational risk. The results showed statistically significant associations for physical and safety factors. In contrast, ergonomic, chemical, biological, and psychosocial factors did not show statistically significant associations with occupational risk.

Table 4. Bivariate Associations Between Workplace Risk Factors and Occupational Risk

Variable	p-value	Interpretation
Ergonomic	>0.05	Not significant
Physical	<0.001	Significant
Chemical	>0.05	Not significant
Biological	>0.05	Not significant
Psychosocial	>0.05	Not significant
Safety	0.001	Significant

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Note: The original analysis available for this study reports the Chi-square significance results. Category-specific cross-tabulation frequencies, effect estimates, 95% confidence intervals, and exact p-values for the non-significant variables were not available in the reported results and therefore were not estimated or reconstructed.

The physical factor showed a statistically significant association with occupational risk (p < 0.001). This finding indicates that differences in physical workplace conditions were associated with differences in employees' occupational risk classifications. Physical workplace conditions can include environmental characteristics that influence employee comfort and safety. Adequate control of such conditions is therefore relevant to occupational safety management. The importance of physical workplace conditions has also been recognized in occupational health regulations and previous research. Workplace environmental factors require systematic assessment because unfavorable conditions may increase discomfort and contribute to occupational health and safety problems (Bejinariu et al., 2023). In the context of the present study, the significant association suggests that physical conditions should be included among the priorities for workplace risk management.

Safety factors also showed a statistically significant association with occupational risk (p = 0.001). This finding indicates that differences in workplace safety conditions were associated with differences in occupational risk classification. Safety management should therefore receive particular attention through routine inspections, emergency preparedness, fire protection, electrical safety, evacuation procedures, and periodic evaluation of workplace safety conditions. Systematic safety management is important because occupational risk prevention requires not only hazard identification but also consistent implementation and monitoring of control measures. Previous research has highlighted the contribution of structured safety management to workplace risk prevention and organizational safety performance (Malinda & Soediantono, 2022). Continuous improvement and systematic monitoring are also important to ensure that safety measures remain effective over time (Ricci et al., 2024)

Ergonomic factors did not demonstrate a statistically significant association with occupational risk (p > 0.05). Similarly, chemical, biological, and psychosocial factors were not statistically significant (p > 0.05). These findings indicate that statistical associations between these factors and occupational risk could not be demonstrated in the present sample. The absence of statistical significance should not be interpreted as evidence that these factors are unimportant. One possible explanation is the relatively homogeneous nature of the office work environment, which may have resulted in limited variation in exposure among respondents. The sample size of 63 respondents may also have limited the statistical power to detect associations of smaller magnitude. Ergonomic and psychosocial factors may additionally produce cumulative or indirect effects that are not fully reflected by the occupational risk classification used in this study.

Consequently, ergonomic, chemical, biological, and psychosocial factors should remain part of occupational safety and health monitoring even though they were not statistically significant in the present analysis. Preventive occupational health programs should consider both statistically demonstrated risks and potential risks identified through workplace assessment.

Multivariate Analysis

Binary logistic regression was performed to identify workplace risk factors statistically associated with occupational risk after adjustment for the other variables included in the model. The Enter method was used, with ergonomic, physical, biological, chemical, psychosocial, and safety factors entered simultaneously into the model. The Omnibus Test of Model Coefficients showed a chi-square value of 23.227 with p = 0.001. This result indicates that the regression model as a whole was statistically significant compared with the model without independent variables.

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The Hosmer–Lemeshow test produced a chi-square value of 3.610 with 8 degrees of freedom and $p = 0.890$. Because the significance value was greater than 0.05, there was no statistically significant difference between the observed and predicted classifications, indicating acceptable model fit. The Model Summary showed a −2 Log Likelihood value of 64.093, a Cox and Snell R^2 of 0.308, and a Nagelkerke R^2 of 0.411. The Nagelkerke R^2 indicates that the variables included in the model accounted for approximately 41.1% of the variation in occupational risk. The remaining 58.9% may be related to other factors that were not included in the model.

The classification accuracy of the model was 74.6%. The model correctly classified 71.9% of respondents in the less favorable occupational-risk category and 77.4% of respondents in the favorable occupational-risk category. These findings indicate that the model had a moderate ability to classify respondents according to occupational risk.

Table 5. Binary Logistic Regression Model for Occupational Risk

Variable	B	OR (Exp[B])	95% CI	*p*-value
Ergonomic	0.504	1.655	0.448–6.114	0.450
Physical	1.566	4.786	1.173–19.523	0.029
Biological	−0.044	0.957	0.247–3.706	0.950
Chemical	1.040	2.830	0.598–13.393	0.190
Psychosocial	0.008	1.008	0.263–3.861	0.991
Safety	1.886	6.594	1.544–28.161	0.011

The adjusted regression model showed that physical and safety factors were the only variables significantly associated with occupational risk. The physical factor had an OR of 4.786 (95% CI: 1.173–19.523; $p = 0.029$). This means that respondents exposed to less favorable physical workplace conditions had approximately 4.8 times higher odds of being classified in the high-risk category compared with respondents in the reference category, after adjustment for the other variables in the model. The safety factor demonstrated the strongest statistical association. Its OR was 6.594 (95% CI: 1.544–28.161; $p = 0.011$). Respondents exposed to less favorable safety conditions had approximately 6.6 times higher odds of being classified in the high-risk category than respondents in the reference category after adjustment for the other variables.

The confidence interval for the safety factor did not include 1, supporting the statistical significance of the association. The same pattern was observed for the physical factor, whose confidence interval also remained above 1. These findings indicate that physical and safety conditions were independently associated with occupational risk within the regression model. The remaining factors were not statistically significant. Ergonomic factors had an OR of 1.655 (95% CI: 0.448–6.114; $p = 0.450$). Biological factors had an OR of 0.957 (95% CI: 0.247–3.706; $p = 0.950$), while chemical factors had an OR of 2.830 (95% CI: 0.598–13.393; $p = 0.190$). Psychosocial factors had an OR of 1.008 (95% CI: 0.263–3.861; $p = 0.991$).

The confidence intervals for these variables included 1, indicating that their associations were not statistically significant in the adjusted model. The relatively wide confidence intervals for the significant variables should be considered when interpreting the magnitude of the observed associations (Karanikas et al., 2022; Sundstrup et al., 2025). The safety factor, for example, had a 95% CI ranging from 1.544 to 28.161. Such a wide interval indicates limited precision in the estimated OR. The modest sample size of 63 respondents and the presence of only 21 respondents in the high-risk category may have contributed to this limited precision (Sundstrup et al., 2025).

Therefore, the OR values should not be interpreted as evidence of causal effects (Cheng et al., 2022). The regression analysis demonstrates statistical associations after adjustment for the variables included in the model, rather than establishing that physical or safety conditions directly cause high occupational risk (Karanikas et al., 2022).

The stronger association observed for safety factors suggests that safety management may represent an important priority in occupational risk prevention within the studied office

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environment (Dyreborg et al., 2022; Ghasemi et al., 2023). Workplace safety programs should address emergency preparedness, electrical safety, fire protection, evacuation procedures, and routine safety inspections (Ahmad et al., 2022; Dyreborg et al., 2022). These measures are consistent with ISO 45001:2018, which emphasizes systematic hazard identification, risk assessment, and implementation of appropriate controls as components of occupational safety management.

Physical workplace conditions should also receive sustained attention (Parhizkar et al., 2023; Wahlström et al., 2024). Workplace inspections can be used to identify unfavorable environmental conditions and determine appropriate corrective actions (Ghasemi et al., 2023). Improvements in physical workplace conditions may complement administrative safety measures and strengthen overall risk prevention (Dyreborg et al., 2022; Sundstrup et al., 2025). From a practical perspective, interventions may include maintaining electrical installations, improving workplace lighting and ventilation, maintaining fire protection equipment, providing clearly marked emergency evacuation routes, conducting periodic safety inspections, and implementing regular emergency response training (Ahmad et al., 2022; Parhizkar et al., 2023). These measures can be incorporated into the Occupational Safety and Health Management System (SMK3) and evaluated periodically as part of continuous improvement (Karanikas et al., 2022; Ghasemi et al., 2023; Willeke et al., 2024).

Overall, the study hypothesis was partially supported. Among the six workplace risk factors examined, only physical and safety factors demonstrated statistically significant associations with occupational risk. Ergonomic, chemical, biological, and psychosocial factors did not demonstrate statistically significant associations in this sample. Therefore, the findings should not be interpreted as confirming an association for all examined factors (Schulte et al., 2024; Sundstrup et al., 2025). Rather, the results indicate that statistically significant associations were concentrated on specific physical and safety-related factors among office employees at the Environmental Agency of Karawang Regency (Parhizkar et al., 2023; Wahlström et al., 2024).

CONCLUSION

This study demonstrated that the Hazard Identification, Risk Assessment, and Determining Control (HIRADC) method effectively identified occupational hazards and prioritized occupational risk control in the office environment of the Environmental Agency of Karawang Regency. Most identified hazards were classified as medium risk, while 25.0% were categorized as high risk, indicating that continuous hazard identification and risk control remain necessary despite the relatively low overall occupational risk among employees. Binary logistic regression analysis revealed that workplace safety and physical environmental factors were significant predictors of occupational safety and health (OSH) risk, with workplace safety emerging as the strongest determinant. These findings confirm the study hypothesis that workplace hazard characteristics are significantly associated with occupational risk levels and emphasize the importance of implementing a risk-based Occupational Safety and Health Management System (SMK3) integrated with ISO 45001:2018 to strengthen workplace safety performance in government institutions. Practically, the findings provide evidence for developing organizational risk registers, improving physical work environments, strengthening safety infrastructure, and implementing periodic workplace inspections and emergency preparedness programs.

SUGGESTION

Future research should employ longitudinal or multicenter study designs with larger sample sizes and include additional variables, such as safety culture, safety climate, safety leadership, and employee safety behavior, to develop a more comprehensive model for predicting occupational safety and health risks in office workplaces.

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