THE IMPLEMENTATION OF OCCUPATIONAL SAFETY AND HEALTH (K3) IN EMPLOYEES

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Abstract

The implementation of Occupational Safety and Health (K3) in employees, with a focus on the analysis of workplace accident data from BPJS Ketenagakerjaan in 2023, which recorded more than 300,000 cases across various industrial sectors. The research method employed was a literature review and descriptive analysis of various research articles related to K3 implementation, compliance with the use of Personal Protective Equipment (PPE), and the relationship between K3 implementation and employee productivity and performance. The research findings indicate that K3 implementation remains low and has not yet become a fully established workplace culture, resulting in significant humanitarian and economic impacts. Major threats include insufficient K3 training, disregard for safety procedures, inadequate working environmental conditions, and lack of supervision. The proposed solutions include commitment from top management, provision of adequate resources, implementation of regular training, provision of quality PPE, supervision and evaluation of K3 implementation in the field. Additionally, it is important to build a strong safety culture through open communication and recognition of safe work behaviors, as well as implementing proactive risk management to prevent accidents before they occur.

Keyword: Implementation, Safety, Health, Work, Employees

INTRODUCTION

Occupational Safety and Health (K3) is a crucial aspect that concerns the protection of workers from risks of accidents and work-related diseases. The implementation of K3 aims to create a safe, healthy, and productive work environment through the identification, evaluation, and control of potential hazards in the workplace. K3 involves various aspects, including policies, procedures, training, the use of Personal Protective Equipment (PPE), and commitment from all relevant parties, ranging from management to employees.

Occupational Safety and Health (K3) is an integrated system aimed at preventing accidents and work-related diseases, as well as creating a safe and healthy work environment. K3 is not merely compliance with regulations but also represents a strategic investment that can increase productivity, reduce operational costs due to accidents, and enhance the company's reputation.

K3 is a shared responsibility between management and employees. Management is responsible for providing adequate resources, establishing clear policies, and ensuring the implementation of K3 programs. Meanwhile, employees are responsible for complying with safety procedures, using PPE correctly, and reporting potential hazards in the workplace.

The history of K3 originated from the industrial revolution in Europe during the 18th and 19th centuries, when working conditions were extremely poor and many workers suffered accidents and work-related diseases. These conditions prompted the emergence of social movements and labor unions demanding improvements in working conditions and worker protection.

In the early 20th century, several countries began issuing K3 legislation to regulate working conditions and provide worker protection. The development of K3 has continued to the present

day, with the emergence of international standards such as ISO 45001 and new technologies such as Virtual Reality (VR) and Augmented Reality (AR) being used to enhance training and hazard identification.

According to [1], K3 is an effort to create safe and healthy working conditions, thereby reducing the risk of accidents and work-related diseases. Effective K3 implementation requires commitment from all relevant parties, ranging from management to employees.

Meanwhile, according to [2], K3 is not merely a legal obligation but also represents a strategic investment that can increase productivity and enhance company competitiveness. Good K3 implementation creates a positive work culture, increases employee satisfaction, and ultimately contributes to the long-term success of the organization.

Data from BPJS Ketenagakerjaan in 2023 recorded more than 300,000 cases of workplace accidents [3] occurring across various industrial sectors in Indonesia. This figure indicates that awareness of K3 implementation remains low and has not yet become fully established as a workplace culture. This is supported by various empirical studies revealing that K3 implementation is often merely administrative in nature and has not yet addressed safe work behavior and culture aspects.

Factors causing workplace accidents include insufficient K3 training, disregard for safety procedures, inadequate working environmental conditions, employee fatigue, and lack of supervision from management. Data also shows that the construction, manufacturing, and mining sectors have the highest workplace accident rates.

To address K3 issues, commitment from top management is required through the provision of adequate resources, establishment of clear policies, and active involvement in K3 program implementation. This commitment must be effectively communicated [1] to all employees to create mutual understanding and awareness regarding the importance of K3.

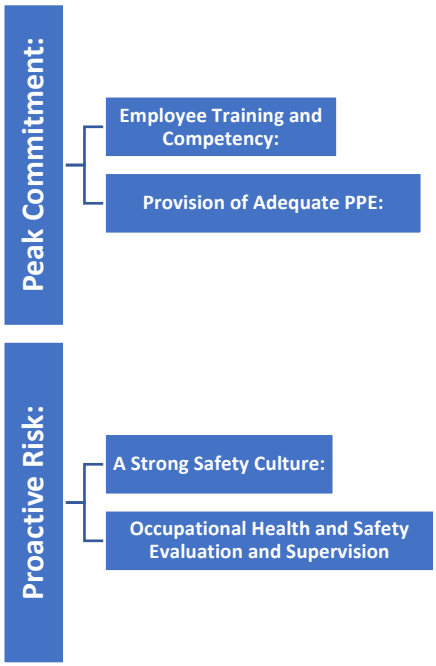
Additionally, efforts are needed to increase employee awareness and understanding of K3 through regular training, provision of quality PPE, and supervision and evaluation of K3 implementation in the field. Management should also provide incentives or rewards for employees who actively participate in K3 programs, as well as impose sanctions for violations of safety procedures.

K3 is generally defined as all activities to ensure and protect the safety and health of workers through efforts to prevent workplace accidents and work-related diseases. K3 also encompasses efforts to create a safe, healthy, and comfortable work environment for workers [4].

In a broader context, K3 also includes protection of the general public and the environment from negative impacts of industrial activities. This aligns with the concept of sustainable development that emphasizes the importance of balance between economic, social, and environmental aspects.

The title "Implementation of Occupational Safety and Health (K3) in Employees" highlights the importance of K3 implementation in protecting employees from risks of accidents and work-related diseases. This background provides a broader context regarding the understanding, history, problems, solutions, and definition of K3, as well as how it relates to efforts in implementing K3 for employees.

By understanding the background of K3, it is hoped that readers can better appreciate the importance of K3 implementation in the workplace and contribute to creating a safe, healthy, and productive work environment. Effective K3 implementation will provide benefits for employees, the company, and society as a whole.



RESEARCH METHODS

This research will employ a literature review method with a qualitative approach to analyze the implementation of Occupational Safety and Health (K3) in employees. The qualitative approach was selected to deeply understand how K3 is implemented, the challenges faced, and its impact on employee productivity and performance. Data will be collected from 20 research articles accredited by ISSN, SINTA, and Scopus. Primary data sources include Google Scholar, Garuda Portal, and Scopus to ensure comprehensive and relevant literature coverage. The search process will use keywords such as "Occupational Safety and Health," "K3 Implementation," "Employee Productivity," and "K3 Culture." Article inclusion criteria include publications within the last 5 years (2020-2025) and relevance to the industrial context in Indonesia. Data analysis will be conducted using thematic methods, identifying patterns, themes, and trends emerging from the reviewed literature. Analysis results will be presented descriptively, providing a comprehensive overview of K3 implementation and its implications. Additionally, this research will seek other sources such as reports from BPJS Ketenagakerjaan and publications from the Ministry of Labor to enrich the analysis and provide a broader context. With this approach, it is hoped that the research can provide deep insights and useful recommendations for improving K3 implementation across various industrial sectors [5].

RESEARCH RESULTS

The following table presents a summary of XX research articles analyzed, focusing on the implementation of Occupational Safety and Health (K3), compliance with Personal Protective Equipment (PPE) usage, and the relationship between K3 implementation and employee productivity and performance across various industrial, construction, and service sectors. The information presented includes author names, publication year, research objectives, methods used, data collection instruments, and relevant research findings, providing a comprehensive overview of trends, challenges, and innovations in K3 implementation across various organizational contexts.

Table 1. Literature Review

No	Author Name, Year & Article Title	Research Objectives	Research Method	Instruments	Research Results
1	[6]. Title: Analysis of Occupational Safety and Health Using Job Safety Analysis Method and Implementation of 5S in Lathe Workshop Source Engineering Jakarta South	Analyzing the implementati Occupational Safety and Health (5S programs in Lathe Workshop Engineering. Additional ob included analyzing and evaluating 5S implementation, particularly cor workplace accident risks, to improvement recommendations.	Descriptive qualitative method. Data analyzed using Job Safety Analysis (JSA) method.	1. Library research. 2. Field research including direct observation, interviews with workers, business owners and customers, as well as documentation and primary data collection.	1. K3 implementation in Lathe Workshop has not fully complied with applicable K3 legislation regulations. 2. Main findings included insufficient Personal Protective Equipment (PPE) usage, minimal K3 training, and lack of proper emergency response procedures and documentation. 3. JSA analysis identified high-risk work activities involving sharp tools (chisels, drills) and improperly arranged electrical cables, both with Risk Score 12 (Very High category). 4. Recommendations included enhanced K3 training, stricter PPE supervision, formulation of work safety procedure documents, and implementation of 5S program (Seiri, Seiton, Seiso, Seiketsu, Shitsuke) to strengthen K3 culture.
2	[7] Title: Implementation of Occupational Safety and Health Program in Improving Employee Work Productivity at PT. PLN (Persero) ULP Raha	Analyzing the implementation of Occupational Safety and Health (K3) program at PT. PLN (Persero) ULP Raha and its relationship with employee work productivity	Qualitative descriptive approach. Data analyzed using the interactive model of Miles, Huberman, & Saldaña, consisting of data reduction, data	1. In-depth interviews with semi-structured guidance. 2. Participatory observation of employee work activities, PPE	1. K3 program implementation at PT. PLN (Persero) ULP Raha has comprehensively covered major aspects such as PPE usage, occupational safety training, socialization of safe work procedures, and routine health checks. 2. K3 implementation has proven to contribute to increased employee work

No	Author Name, Year & Article Title	Research Objectives	Research Method	Instruments	Research Results
			presentation, and conclusion drawing.	usage, and safe work procedures. 3. Documentation in the form of internal company archives (K3 SOPs, accident reports, absence records, training documents). 4. Research informants: 14 people, consisting of field technical staff, administrative personnel, and HSSE officers, selected using purposive sampling.	productivity, demonstrated by reduced accident risks, improved discipline, and increased sense of safety at work. 3. Challenges identified include some employees still not fully compliant with PPE usage and limited supporting facilities for K3. 4. Recommendations include need for enhanced supervision, consistency in K3 training implementation, and strengthening of safe work culture to continue increasing productivity.
3	[8] Title: Analysis of Occupational Safety and Health (K3) Implementation at PT. XYZ - KARAWANG	To identify, analyze, and explain how occupational safety and health (K3) implementation is conducted at PT. XYZ	Descriptive qualitative. Data analyzed descriptively and qualitatively by comparing observational results with literature.	Interviews, observation, and literature review.	K3 implementation at PT. XYZ has been implemented and applied well and enables reduction of K3 risks in the company according to requirements.

No	Author Name, Year & Article Title	Research Objectives	Research Method	Instruments	Research Results
4	[9] Title: Implementation of Occupational Safety and Health (K3) Program on Employee Productivity at PT. Tani Prima Makmur Palm Oil Processing Unit (PKS), Konawe District	To create an integrated K3 management system to prevent and reduce accidents and work-related diseases, as well as create a safe, efficient, and productive work environment.	Quantitative approach from results testing the influence of occupational safety and health.	Interviews, observation, and literature review.	Occupational safety and health significantly and positively influence employee productivity at PT Tani Prima Makmur (PKS). Occupational health programs were more dominant in influencing employee productivity.
5	(Nugroho, Utami, and Trisnawati 2025) Title: Analysis of the Influence of Occupational Safety and Health (K3) Implementation on Employee Work Productivity at CV. Tirta Cahya Adi	Analyzing the influence of K3 implementation on employee productivity and determining priorities for improving 30 K3 indicators at CV. Tirta Cahya Adi.	Quantitative. Using Multiple Linear Regression and Importance Performance Analysis (IPA). Population of 30 employees (saturated sampling).	Questionnaire	1. Occupational Safety (X1) positively and significantly influences productivity. 2. Occupational Health (X2) does not significantly influence. 3. Simultaneously, K3 significantly influences productivity.
6	[11] Title: Analysis of K3 Program Implementation and Workplace Accidents (Case Study at PT Gemilang Prima Utama)	To identify K3 program implementation and two main factors causing workplace accidents.	Descriptive quantitative.	Sample: 100 employees (Operational, Workshop, Site Project).	K3 program implementation has been carried out well. Two main factors causing workplace accidents are work supervision and work negligence.

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7	[12] Title: Implementation of K3 Standards with Workplace Accident Incidents in Tunnel Workers for PLTA Development	Analyzing the application of K3 standards with workplace accident incidents.	Descriptive quantitative.	Implementation of safety induction and K3 signage application.	Accidents occurred due to worker non-compliance in using PPE and lack of habituation in PPE usage.
8	[13] Title: Influence of Training and K3 on Employee Performance (PT Lutvindo Wijaya Perkasa)	Analyzing the relationship between training and K3 and employee performance at PT. Lutvindo Wijaya Perkasa Pekanbaru.	Quantitative. Data analysis using Linear Regression with SPSS program.	Questionnaire. Sample: 57 respondents.	1. Training and K3 (partially) significantly impact employee performance. 2. Jointly (simultaneously), training and K3 significantly impact employee performance (F-count 59,409 > 3.15). 3. Training and K3 contribute 68.8% to improving employee performance.
9	[14] Title: Management of Occupational Safety and Health Implementation in Construction Engineering and Property at PT XXX Year 2024	To identify the implementation of Occupational Safety and Health in Construction Engineering and Property.	Descriptive research with qualitative approach. Using purposive sampling technique, sample size of 191.	Univariate and bivariate analysis. Mann Whitney test used to view variable overview.	Research results show that the Sig value or P Value of K3 determination variables (0.005), K3 Planning (0.001), K3 Implementation (0.001), and K3 Evaluation (0.01) have influence on K3 Determination, Planning, Implementation, and Evaluation on Construction Engineering and Property Worker K3 Implementation at PT XXX Year 2024. Therefore, every company policy must be aligned with K3 policies established with company commitment.

No	Author Name, Year & Article Title	Research Objectives	Research Method	Instruments	Research Results
10	[15] Journal: Editorial: Use of AR/MR/VR in the Context of Occupational Safety and Health	To highlight the role of Extended Reality (XR), which includes Virtual Reality (VR), Augmented Reality (AR), and Mixed Reality (MR), in transforming and shaping K3 development.	Editorial (Not an empirical research/research study collecting new data).	Discusses the application of XR technology (VR, AR, MR) as the main tool in K3	XR plays an important role in advancing K3. Main benefits include: Immersive and hands-on training in controlled environments without actual risk; Enhanced real-time hazard identification and risk assessment (e.g., AR can display safety guidance or hazardous areas); Enhanced emergency preparedness and response; and Enhanced training accessibility and adaptability.
11	[16] Title: The Effectiveness of the Occupational Health and Safety Assessment Series 18001:2007 PT. Surya Besindo Sakti	This research aims to determine the effectiveness of implementing Occupational Health and Safety Assessment Series (OHSAS) 18001:2007 at PT. Surya Besindo Sakti.	Qualitative descriptive research type and research design.	Test of data validity using triangulation techniques. Results:	PT. Surya Besindo Sakti still meets minimal requirements for implementing Occupational Health and Safety Assessment Series (OHSAS) 18001:2007. With findings of 6 minor non-conformities and 1 OFI (Opportunity For Improvement).
12	[17] Title: Implementation of Safety Net as an Effort to Prevent Workplace Accidents at Telkomsel Smart Office Facility Support Project	To evaluate the effectiveness of safety net implementation, identify causes of non-compliance, and formulate recommendations for improving workplace safety.	Descriptive qualitative approach.	SMKK 2023 Standard (Ministry of PUPR Regulation No. 10 Year 2021) and OSHA 1926.502 regarding fall protection system criteria.	Main Findings: Safety net implementation does not meet technical criteria of SMKK 2023 and OSHA 1926.502, either in terms of width, position, or coverage. Example of Non-Conformity: Net width only 1 meter (minimum standard 3.5 meters), installed after upper structure was poured, not before vertical work began. Incidents: Three material drop incidents from upper floor occurred during

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					construction period (September to November 2024). Recommendations: Improvement of material specifications, standardized installation procedures, and periodic training for workers.
13	[18] Title: Management of Occupational Safety and Health Risk in Nurses Using Hazard Identification Risk Assessment and Risk Control	To identify K3 risk management using the Hazard Identification Risk Assessment and Risk Control (HIRARC) method on nurses.	Qualitative research with case study approach. Location and Time: Inpatient Ward Room at Hospital X, Depok in March to June 2021.	Observation and semi-structured interviews, AS/NZS 4360:2004 for identifying and assessing risk (likelihood and severity).	Hazard Identification: Seven work activities identified with potential hazards. Risk Classification: Work activities classified as Extreme risk (4 activities), High risk (4 activities), and Low risk (2 activities). Extreme Hazard: Injectable drug administration (risk of needle prick and disease transmission from patient). Control Efforts: Implementation of SOPs and PPE usage (Administrative Control and PPE). Suggestions: Supervisors should conduct regular supervision to nurses in implementing workplace safety.
14	[19] Title: Implementation of Occupational Safety and Health Management System in the Education Sector	To implement Occupational Safety and Health Management System (OSHMS) at the Faculty of Public Health, Muhammadiyah University Jakarta.	Descriptive qualitative and quantitative analysis.	Measurement based on Indonesian Government Regulation No. 50 Year 2012 on OSHMS Implementation.	Compliance Level (Compliance) Value of OSHMS compliance at Faculty of Public Health is 87.2%, which falls in the Satisfactory category. Element with highest value is K3 Policy (100%). Element with lowest value is Management Review (66.67%). Conclusion: OSHMS implementation in the education sector, particularly at the

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					Faculty of Public Health, has achieved satisfactory status and needs further improvement in the management review element.
15	Pavlo Saik et al., 2025. "Influence of Occupational Safety Culture on the Occupational Risk Level in the Organization." Frontiers in Public Health.	Developing methodology to assess workplace risk level considering occupational safety culture in the organization.	Quantitative approach using mathematical modeling and simulation based on OHSMS.	Risk-based Safety Culture Maturity Model (Bradley Curve).	Found that safety culture significantly influences workplace risk level. Employees with high safety awareness and compliance with K3 reduce accident rates up to 40%.
16	Implementation of Occupational Safety and Health Management System in the Education Sector (Purnamawati et al., 2023, Muhammadiyah University Jakarta)	Analyzing the implementation of Occupational Safety and Health Management System (OSHMS) in the education sector.	Descriptive qualitative & quantitative.	Measurement based on Indonesian Government Regulation No. 50 Year 2012.	OSHMS compliance value reached 87.2% (satisfactory category). K3 policy element highest (100%), while management evaluation element still low (66.7%).
17	Andi Sarbiah, 2023. "Implementation of Occupational Safety and Health (K3) in Employees." Health Information: Research Journal, Vol. 15 No. 2.	Examining K3 implementation in improving employee welfare and productivity in the work environment.	Qualitative descriptive (literature review).	Analysis of literature from journals, industry reports, and K3 regulations.	Effective K3 implementation reduces workplace accidents and increases satisfaction and productivity. The role of management is very important in fostering K3 culture.

No	Author Name, Year & Article Title	Research Objectives	Research Method	Instruments	Research Results
18	Wahyuni, R., & Sitorus, D., 2024. "Analysis of Occupational Safety and Health (K3) Implementation at PT Petro Gasindo." Indonesian Journal of Occupational Safety and Health, Vol. 10 No. 1.	Evaluating K3 policy implementation at oil and gas companies.	Descriptive qualitative.	Field observation, interviews, and HSSE documents.	K3 implementation found to be quite good but still lacking in training and routine internal audit aspects. Enhanced supervision and ongoing training recommended.
19	Lestari, S. et al., 2022. "Influence of OSHMS Implementation on Worker Productivity in Manufacturing Industry." Journal of Technology and Occupational Safety.	Analyzing the influence of OSHMS implementation on labor productivity.	Quantitative -- Linear Regression.	Questionnaire to 80 factory workers.	Results show OSHMS implementation significantly influences 52% productivity increase. Training and supervision aspects most influential.
20	Rahmadani, T., & Yuliani, A., 2021. "Evaluation of K3 Implementation in Public Building Construction Project Workers in Pekanbaru City." Indonesian K3 Scientific Journal.	Evaluating the effectiveness of K3 implementation in public construction projects.	Descriptive qualitative.	Observation and interviews with field workers and foremen.	Found 75% of workers already use PPE correctly. However, still deficient in safety signage provision and routine tool inspection.

DISCUSSION

Occupational Safety and Health (K3)

Occupational Safety and Health (K3) is a field concerning the protection of workers from risks of accidents and work-related diseases. K3 aims to create a safe, healthy, and productive work environment by identifying, evaluating, and controlling potential hazards in the workplace. K3 implementation involves various aspects, including policies, procedures, training, and use of Personal Protective Equipment (PPE), as well as commitment from all relevant parties, ranging from management to employees.

K3 is an integrated system in company operations and represents shared responsibility among all parties. Effective K3 implementation requires a holistic approach encompassing technical, managerial, and behavioral aspects. Beyond protecting employees from physical hazards, K3 also includes protection of workers' mental health and psychological well-being. In a modern context, K3 is viewed not merely as a legal obligation but also as a strategic investment that can increase productivity, reduce operational costs from accidents, and enhance company reputation [20].

Good K3 implementation creates a positive work culture, increases employee satisfaction, and ultimately contributes to the long-term success of the organization. K3 also plays an important role in meeting government regulatory requirements, international standards such as ISO 45001, and stakeholder expectations including customers, investors, and the community.

Workplace Accident Data

Data from BPJS Ketenagakerjaan in 2023 recorded more than 300,000 workplace accident cases occurring across various industrial sectors in Indonesia [3]. This figure indicates that awareness of K3 implementation remains low and has not yet become fully established as a workplace culture. This is supported by various empirical studies revealing that K3 implementation is often merely administrative in nature and has not yet adequately addressed safe work behavior and cultural aspects.

The high number of workplace accidents results in significant impacts, both in humanitarian and economic terms. Each workplace accident not only causes suffering for victims and their families but also results in financial losses for the company including medical costs, compensation, loss of productive working hours, equipment damage, and decreased employee morale. Further analysis shows that most workplace accidents are actually preventable through consistent and comprehensive K3 implementation [21].

Factors causing workplace accidents include insufficient K3 training, disregard for safety procedures, inadequate working environmental conditions, employee fatigue, and lack of supervision from management. Data also shows that the construction, manufacturing, and mining sectors have the highest workplace accident rates. Therefore, more serious and structured efforts are required to reduce workplace accident rates through sustained preventive and educational approaches.

Commitment to Occupational Safety and Health

Commitment to K3 must begin at the top management level. Management must demonstrate tangible support through provision of adequate resources, establishment of clear policies, and active involvement in K3 program implementation. This commitment must be effectively communicated to all employees to create mutual understanding and awareness regarding the importance of K3.

Additionally, K3 commitment must be realized through concrete actions, such as implementation of regular training, provision of quality PPE, and supervision and evaluation of K3 implementation in the field. Management should also provide incentives or rewards for employees who actively participate in K3 programs, as well as impose sanctions for violations of safety procedures [22].

Strong K3 commitment must be reflected in the company's vision and mission and integrated into every aspect of business operations. Top management must conduct regular reviews of K3 performance, allocate adequate budgets, and ensure that every business decision considers occupational safety and health aspects. Visionary leadership in K3 will inspire all employees to adopt safe work behavior as part of their personal values.

Two-way communication between management and employees is crucial in building K3 commitment. Employees should be encouraged to report potential hazards, near misses, and incidents without fear of negative consequences. A transparent and responsive reporting system will help identify problems early before they develop into serious accidents. Additionally, employee involvement in K3-related decision-making will increase their sense of ownership and responsibility toward safety programs [23].

Morning Exercise (Warm-up)

Morning exercise or warm-up before beginning work plays an important role in maintaining employee health and safety. Warm-up helps increase blood circulation, prepares muscles and joints, and reduces the risk of injury from sudden movements or non-ergonomic work positions.

Beyond physical benefits, morning exercise can also increase employee work spirit and motivation. The movements performed help eliminate drowsiness and increase concentration, enabling employees to be more prepared and focused in performing their tasks. Morning exercise can also serve as a means of social interaction among employees, which can strengthen work relationships and improve team cooperation [24].

Structured and consistent morning exercise programs provide long-term benefits for employee musculoskeletal health, particularly for those performing heavy physical work or static posture work for prolonged periods. Research shows that proper warm-up can reduce muscle and joint injury risk by 30-40%. Stretching movements performed in morning exercise also help improve body flexibility and reduce muscle tension commonly experienced by workers.

The psychological aspect of morning exercise is equally important. Group activity in the morning creates a positive atmosphere and increases team cohesion. Employees who feel connected with colleagues tend to have higher job satisfaction levels and are more concerned about each other's safety. Morning exercise can also serve as an opportunity to convey important K3-related information, remind safety procedures, or discuss learning from previously occurring incidents [25].

Timely Meal and Rest Breaks

Timely meal and rest breaks represent an important part of efforts to maintain employee health and productivity. Delayed meals can cause a drop in blood sugar levels, resulting in fatigue, decreased concentration, and increased risk of work errors.

Adequate rest is also important for restoring energy and reducing work-related stress. Employees who work without sufficient rest tend to become more easily fatigued, less focused, and more prone to workplace accidents. Therefore, companies must arrange work schedules

that allow employees to eat and rest appropriately, as well as provide adequate facilities to support these activities.

Scheduling of meals and rest must consider workload, shift duration, and type of work performed. Companies should provide comfortable rest areas that are clean and separate from the work area, enabling employees to truly disconnect from work pressure during rest time. Hygienic dining facilities with nutritious food options are also important to ensure employees receive adequate nutritional intake to maintain energy and concentration throughout the working day [26].

Ergonomic research shows that mental and physical fatigue represent major contributing factors in workplace accidents. Regular and quality rest helps reduce cumulative fatigue and increases alertness. Beyond meal breaks, micro-breaks or short rest periods of 5-10 minutes every 2 hours of work are also recommended, particularly for work requiring high concentration or monotonous work postures. With good work and rest time management, companies can create a safer and more productive work environment.

Safety Equipment for Employees

Safety equipment or Personal Protective Equipment (PPE) represents equipment that employees must use to protect themselves from potential hazards in the workplace. PPE includes helmets, goggles, masks, gloves, safety shoes, and protective clothing, customized according to the type of work and risks faced.

Proper and correct PPE usage can reduce the risk of injury or work-related disease. However, PPE is only effective if used correctly and in accordance with applicable standards. Therefore, companies must provide training to employees regarding proper use, maintenance, and storage of PPE. Additionally, companies must ensure that provided PPE meets established quality and safety standards [27].

PPE selection must be based on comprehensive risk assessment results for each type of work. PPE represents the last line of defense in the hierarchy of risk controls, after elimination, substitution, engineering controls, and administrative controls. Nevertheless, PPE still plays a crucial role in protecting employees from hazard exposure that cannot be completely eliminated through other control methods [28].

Companies must ensure adequate availability of PPE in sufficient quantities, good condition, and appropriate sizes for each employee. Uncomfortable or ill-fitting PPE will reduce compliance with usage and protection effectiveness. A good PPE management program includes procedures for regular inspection, replacement of damaged or expired PPE, and documentation of PPE distribution and usage. Employee involvement in PPE selection is also important to ensure user comfort and acceptance.

Beyond PPE provision, companies must implement monitoring and enforcement systems to ensure PPE usage compliance. Supervisors and safety officers must actively conduct field inspections, provide immediate feedback, and enforce PPE usage violations. However, an educational and persuasive approach is more effective than a purely punitive approach. Employees must understand the reasons behind each PPE requirement and the consequences of non-usage, enabling them to consciously choose to protect themselves [29].

Safety Culture

Safety culture represents the collective values, attitudes, and behaviors of employees and management that support safe and sustainable work practices. Strong safety culture is characterized by commitment from all parties, open communication, and recognition of safe work behavior.

Building safety culture requires time and consistent effort from the entire organization. Safety culture cannot be purchased or implemented instantly but must be developed through real examples from leaders, learning from experience, and positive reinforcement of desired behaviors. In a mature safety culture, safety becomes an integral part of daily work operations, not merely a formal procedure to be followed [30].

Indicators of good safety culture include high incident reporting rates (including near misses), active employee participation in K3 programs, low workplace accident rates, and management responsiveness to safety issues. Regular safety culture surveys can help organizations identify areas needing improvement and measure the effectiveness of interventions implemented.

Risk Management

Risk management is the process of identifying, evaluating, and controlling potential hazards in the workplace. Risk management involves various stages, ranging from hazard identification, risk assessment, to establishment of effective control measures.

The risk management process must be conducted systematically and involve workers with practical knowledge about the work. Hazard identification can be conducted through various methods such as workplace inspection, accident analysis, Job Safety Analysis (JSA), and employee consultation. After hazards are identified, risks are evaluated based on the probability of occurrence and severity of its impacts [31].

The hierarchy of risk controls must be followed in determining appropriate control measures, beginning with elimination, substitution, engineering controls, administrative controls, and lastly PPE usage. Effectiveness of each control measure must be monitored and reviewed regularly, with adjustments made according to changes in work conditions or emergence of new hazards. Proactive risk management will help prevent accidents before they occur, rather than merely reacting after incidents happen.

Training and Competency

Training and competency represent efforts to increase employee knowledge and skills so they can recognize hazards, apply safety procedures, and respond appropriately to work risks. Effective training must be tailored to the type of work and risks faced, and conducted regularly to ensure employees always possess current knowledge and skills [32].

K3 training programs must include safety induction for new employees, job-specific training, periodic refresher training, and specialized training for workers handling high-risk work. Training methods should vary and be interactive, including classroom training, on-the-job training, simulations, and experience-based learning. Evaluation of training effectiveness through knowledge tests, observation of work practices, and analysis of safety performance is very important to ensure training truly improves employee competency.

K3 competency is not limited to operational employees but must also be possessed by supervisors, managers, and K3 professionals. Competency certification from recognized organizations can be one way to validate individual ability in carrying out their K3 responsibilities. Investment in K3 competency development will provide significant returns in the form of accident reduction, increased productivity, and creation of a safer and healthier work environment [33].

CONCLUSION

Occupational Safety and Health (K3) is a crucial aspect in protecting workers from risks of accidents and work-related diseases. Effective K3 implementation involves identification, evaluation, and control of potential hazards in the workplace, as well as commitment from all relevant parties. Data from BPJS Ketenagakerjaan in 2023 shows that awareness of K3 remains low, with more than 300,000 workplace accident cases occurring across various industrial sectors in Indonesia. Factors causing workplace accidents include insufficient K3 training, disregard for safety procedures, inadequate work environmental conditions, and lack of supervision.

Commitment to K3 must begin with top management through provision of adequate resources, establishment of clear policies, and active involvement in K3 program implementation. Morning exercise, timely meal and rest breaks, and provision of safety equipment (PPE) represent important parts of efforts to maintain employee health and productivity. Strong safety culture is characterized by commitment from all parties, open communication, and recognition of safe work behavior. Proactive risk management, adequate training and competency, and regular evaluation of K3 program effectiveness are also necessary to create a safe and healthy work environment.

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