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EDITORIAL

Comprehensive Analysis of Occupational Health, Safety, and Risk Factors: Examining Exposure, Ergonomics, Fatigue, Rule-Breaking, Safety Performance, and Fire Protection, Work-Related Musculoskeletal Disorders Across Diverse Work Environments

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The challenge of workers being protected from health and safety issues is still an issue in some sectors of employment. There is a need for comprehensive research analyzing risk factors that can cause workers to experience various kinds of problems in the workplace so the workers can be more productive as will be explained in the following articles.

The first is the exposure of lead in fuel station workers. The effect of lead (Pb) can harm health, with fuel stations posing a high risk due to fuel and vehicle emissions. This study examines the impact of Pb exposure on hemoglobin levels and lung function in fuel station workers. While urinary Pb levels and lung function were normal, higher Pb levels significantly reduced the FEV1/FVC ratio. These findings highlight the need for preventive measures and further research on Pb exposure in at-risk populations (Taufiqurrahman, *et al.*, 2024).

Human factors such as workers who often do not comply with the standards applied in the workplace can also be one of the triggers for unwanted things to happen in the workplace. The 2022 National OHS Profile in Indonesia highlights human factors as key contributors to workplace accident risks, with a 100% increase in mining accidents reported in 2022. PT. XYZ, a mining contractor, assessed its safety maturity at a calculative level, indicating that while OHS systems are in place, unsafe behaviours and conditions persist. This paper examines research on employees' internal factors contributing to workplace rule-breaking. Internal factors such as acceptance of risk-taking behaviour, normalization of minor accidents, and decisions to take risks have a positive and significant impact on rule-breaking acts in the workplace (Ikhwanuddin and Djunaidi, 2024).

Meanwhile, to implement workers safety performance, in addition to personality and individual characteristics, safety management also has an important role to protect workers. PT PAL Indonesia, one of the largest shipyards in Indonesia, faces unsafe acts and conditions, as indicated by survey results. This study analyzes the impact of personality, individual characteristics, and safety management practices on worker safety performance in its Commercial Ship Division. Factors such as conscientiousness, personality, age, working period, safety management practices, and safety training all affect worker safety performance at PT PAL Indonesia in 2023, enabling companies to design more effective safety strategies (Aderilla *et al.*, 2024).

In addition to several occupational health and safety issues that can stem from human factors and management commitment, there are several types of jobs that in carrying out their daily work must be in awkward conditions and are at risk of experiencing musculoskeletal-related problems. Work-related musculoskeletal disorders (WRMDs) are a significant health issue for physical therapists treating neurological patients. This study aims to identify the risk factors for WRMDs among physical therapists in South Korea. The findings revealed that these therapists are at high risk of developing WRMDs. As a result, changes to their working patterns are necessary, along with more detailed

evaluations of ergonomic risk factors. (Jeon and Lee, 2024).

Other research related to ergonomics issues has also been carried out at the brick-making workers. The work process to make brick in Indonesia remains largely manual, involving repetitive tasks over long periods and awkward postures. This study aims to assess and mitigate the risk factors associated with these manual tasks that may lead to musculoskeletal disorders (MSDs). The combined use of the WERA and KIM methods proves effective in assessing manual material handling (MMH) risks in brick-production MSMEs, offering insights for targeted ergonomic interventions (Pratiwi and Setyawan, 2024).

Issue related with Musculoskeletal Disorders also experience by office workers such as Non-Teaching Staff in the Universities. An individual's health in paid employment is influenced by factors such as workplace settings, furniture, work design, and tools. This study explores how workplace ergonomics and work-related musculoskeletal disorders affect the health of non-teaching staff in Nigerian public universities. The study concludes that university management must address work-related musculoskeletal disorders through workplace ergonomics to support staff health and job performance. (Akinbode *et al.*, 2024).

Management in a workplace also needs to pay attention to fire protection systems, especially in places with many vulnerable groups such as hospitals. Hospital fires pose higher risks of casualties, injuries, and property loss due to the presence of vulnerable individuals. This study aims to assess the fire protection system, life-saving facilities, and fire management at Hospital X. Hospital X has made significant efforts in fire prevention, achieving 60% compliance with established standards, although some facilities still do not fully meet these requirements. Recommendations for improvement include replacing room doors with gap-free, fire-resistant doors, installing automatic door closers, and replacing gypsum walls with fire-resistant materials. (Andanar and Erwandi, 2024).

To prevent the hazard and to make programs, the management in the workplace should conduct risk assessment. Typically, workplace tend to use qualitative risk assessment, bu in this research they dis a qualitative risk assessment. An oil and gas refinery processes flammable liquids, making it prone to hazards such as leaks that can lead to pool fires. A quantitative risk assessment (QRA) was conducted to identify risks, evaluate potential consequences, and implement mitigation measures. This QRA employed the individual risk per annum method and potential loss of life calculations, revealing that the HVO export facility posed unacceptable risks. Mitigation measures, including the addition of safeguards and the reduction of working hours, successfully reduced all risk criteria to acceptable levels. (Tjahjono and Ramadhani, 2024).

In other sectors, for instance in manufacture sector, the commitment to implement occupational health and safety system management is still become a big issue. Medium-sized firms globally face challenges hindering their growth, with lack of global best practices in health and safety being a key issue. This study examines health and safety conditions in selected medium-sized manufacturing firms in Nigeria. Health and safety issues hinder Nigerian medium-sized manufacturing firms. Addressing this is crucial to strengthen the industry, with a focus on promoting hygienic health systems and a safety culture among workers and management (Akinbode *et al.*, 2024).

Further topic is psychological hazard. These kind of hazards are not easy to realize it since it come from the inner factor from each individual. People who do the monotonous activity tend to experience work fatigue. This problem happened often overlooked due to its non-specific and invisible symptoms, contributes to over 60% of workplace accidents. This study analysis the impact of physical activity and muscular strength on fatigue incidence among sedentary workers at Kalla Group in Makassar, South Sulawesi. Workers need to do light muscle stretching so that workers do not get tired easily when working in a static position for a long time and workers also need to adopt a healthy lifestyle (Arini *et al.*, 2024).

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