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Influence of Occupational Health and Safety System Implementation on Occupational Diseases to Factory Workers

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ABSTRACT

Occupational health and safety system (OHS) is expected to prevent occupational diseases, incidents during work, and to guarantee the protection of workers. They should integrate the OHS system in its management. As a result, there is a feasibility of minimizing occupational diseases in factory workers because of the efficiency protection from the OHS division. The study used a literature review that aims to identify the implementation of OHS system and to lessen ocupational diseases on factory workers. The utilized database programs were Google Scholar, PubMed, Science Direct, and PEDro using the keywords Ergonomic, OHS, and occupational diseases. There were found 10 articles related to the topic that was published from 2019 to 2021. Six of them were from Indonesia's journal while the rest were from international journal.Many big factories had already applied the OHS system in Indonesia to ensure the safety of their workers whereas the OHS meeting was less important to be discussed in Sweden.There was a particular disease that could not be avoided such as hearing disorders due to the continuously high-intensity noise exposure. However, OHS system had succeed to measure the danger level of an activity at work and minimize the casualties.

Keywords: ergonomic, occupational diseases, occupational health and safety (OHS)

INTRODUCTION

According to government regulation number 50 of 2012, every factory that employs at least 100 employees or has high potential danger processing production are expected to implement occupational health and safety (OHS) program in order to secure the safety of the people. Santoso (2004) conveys that administering and controlling work accident can be achieved by conducting risk management to reduce the accident at work or even prevent the worst case scenario. Meanwhile, Tarwaka (2008) states that the end goals of OHS program are to increase the welfare of the workers comprehensively. OHS is the system that helps to organize the standard operating, safety equipment, and health socialization at the factory to maintain the workers productivity. If by any chance there are accidents during work, the production will stop that makes the factory to be in the loss side. OHS program helps to reduce 33.05% work-related accident (Binwasnaker, 2020). Essentially, OHS gives benefit for both sides the factory and the workers.

According to International Labour Organizaton ILO (2021), there are around 2.3 million people suffered during work or from occupational diseases cases. Musculoskeletal disorders are also included in the type of occupational diseases. It can be happened because there is an inefficiency of posture and unproper repetitive movement in the workstations. There is a string of connection between the workstation oganization and musculoskeletal disorders (So et al, 2019). Russo (2020) found that the pain of the lower body were significantly influenced by the workers workplace, body position, operative

duration, and shift period. Integrating OHS system is the key to increase the safety of the workers. Yoon et al (2013) states that there is a reduction in the mean level of coincidence because of implementing OHS system. This study aims to identify how the implementation of occupational health and safety system and ergonomic on occupational diseases in factory workers.

METHODS

This study uses a literature review research design. Sources of data are obtained through journals to present ideas, ideas, and facts that occur in the field so as to reduce the bias caused and strengthen the analytical data obtained. The articles or journals were searched using a boolean operator system (And, Or, and Not) with the keywords *Ergonomi*, Ergonomics, *Kesehatan dan Keselamatan Kerja (K3)*, Occupational Health and Safety (OHS), *Penyakit akibat Kerja*, and Occupational Diseases. PIO strategy framework was used as a media to find the information dealing with the topic. The inclusion conditions are that the journal is published in the three years between 2019 and 2021, the journal types are classified into qualitative, quantitative, or survey, it is written in English or Indonesian language, it is published by accredited institutions, and the journals are related to ergonomics, OHS, or occupational diseases. Meanwhile, the exclusion conditions are that the journal is published under 2019, access is denied for full text, the articles are written without credible journal references, and paid access is required to view articles.

Descriptive analysis was applied to process the data that had been collected. Explain empirical facts, describe opinions, and analyze data based on needs, so that appropriate conclusions are obtained. The initial selection was carried out using the latest research results for the past three years through systematic and comprehensive databases such as: PubMed, Science Direct, Google Scholar and PEDro. Firstly, it was started by studying the abstracts of the found articles, categorizing the formulation of the problem, aranging the variables concerned, or things that are still relevant to the research data. In addition, providing a quotation from the argument to avoid plagiarism used in the article. Lastly, the next step was to review obtained articles using inclusion and exclusion criteria and conducting in-depth analysis in order to obtain accurate information and credible results.

RESULTS

After selecting from 83 journals using inclusion, exclusion conditions, eliminating duplicate articles, and choosing variables that match the research, it was found that 10 journals consisting of national and international journals were the main sources of analysis in this study. The comparison of the used journals was 60% national journals and 40% international journals. Journals derived from the Google Scholar database have the largest portion of six journals, all of which were national journals, while four journals were obtained from other sources. Of the four journals, two were obtained from the PubMed database, one was obtained from Science Direct, and the last one was found on the PEDro website. The used articles as review material were journals with a combination of three keywords or just using one keyword. Based on the research data selection process, 10 articles came from national and international journals with a percentage of four Indonesian-language journals and six English-language journals.

The focus of the search for articles refered to the application of OHS principles and ergonomics for factory workers to occupational diseases, but not all articles had ergonomics and occupational diseases variables. Therefore, occupational diseases and ergonomics became independent variables in the application of OSH principles to factory workers. There was one article in an international journal from four journals that discussed decision making regarding OSH policies in large companies because there was no independent variable regarding occupational diseases. The research design of 10 articles included qualitative, quantitative, survey and observation research. The survey method was from international journals because it could reach many respondents that was applied over a long period of time. The national research generally applied the observation method by making direct observations and requesting official data from the company or referring to the obtained data by confirming it to the officers or authorities in the field.

Robinson et al (2020) found that the continuous exposure of high noise level impacted significantly on hearing loss for miners and OGE workers. Functionally limited lung, hypertension, and self reported poor or fair health status were some issues that they might encounter in this occupation and could be much worse even after they retired. Russo et al (2020) argued OSH should organize a

system that could feasibly assess ergonomic risk level accurately in order to lower the risk perceiving by the workers. Meanwhile, Lornuds et al (2021) showed that board executive members at company gave influence to the decision-making related to OHS system. According to So et al (2019), ergomotor OHS intervention helped to reduce pain in the lower back body and lower part of the body. The workers age affected their health level, so as the workers getting older the effectiveness and occupational diseases would come to them such as getting hearing loss due to interactions with PLTD engines (Sahupala dan Cipto, 2019).

Imran (2020) states there was always a potential danger in the production activities that were differentiated based on the risk level. According to Fajrianti (2020), improvement on health facilities, maintenance of personal protective equipment (PPE), and constant inspections on OHS management system would minimize occupational diseases and accidents at factory. There was a significant relationship between the history of previous skin diseases, personal hygiene, clean water supply and the use of PPE with the incidence of occupational skin diseases (Ahyanti, 2019). Mayadilanuari (2020) conveys that administrative controls regarding the amount of allowed load must be adhered by all officers to maintain the quality of container equipment and to reduce the risk of equipment damage which could cause injury to workers. Finnaly, Ponda (2019) says that occupational hazards and diseases could be triggered by every activity at work and could be minimized by maintaining the administrative procedure and the procurement of PPE.

DISCUSSION

Implementation of Occupational Health and Safety (OHS) on Factory Workers

The implementation of Occupational Health and Safety (OHS) in every factory needs to be implemented so that employees have a sense of security while working as well as from the company's point of view in order to get an effective and an efficient production results. Basically, the implementation of OHS has a positive impact on the company because it reduces the accidents risk and occupational diseases of the workers, so they can work optimally and increase their attendance at work. In Indonesia, the application of OHS is integrated in the company's occupational health and safety management system, commonly referred to as SMK3. This system has also been regulated and ratified by the state based on Government Regulation of the Republic of Indonesia Number 50 of 2012 concerning the implementation of SMK3.

On the other hand, the OHS implementation also has an international standard that must be owned by every company if it wants to be recognized by the International Organization for Standardization (ISO). The Occupational Health Safety and Assessment Series (OHSAS) is an internationally used operational standard regarding the implementation of OHS policies. According to Akbar and Purwanggono (2020), OHSAS 18001 has started to be replaced with ISO 45001:2018 with three years deadlines for companies if they want to switch to the latest standard based in 2018.

Lornudd et al (2021) suggest that the board of directors has a strong influence in determining and selecting policies related to the implementation of the OHS system in Swedish companies. Decision making by the president director of a Swedish company is influenced by the interests of the board of directors, thus the policies that are deemed to be less profitable or to have no serious problems for the company would not be implemented which was decided at the board of directors meeting. Furthermore, the results of the board of directors meeting must be carried out by the president director and forwarded to the company's field staff, whose progress is continuously monitored. Simanjuntak (2019) explains that there are several elements that influence the decision making related to OSH by the company, namely the personal characteristics of the leader, the characteristics of the company, and the condition of the company.

The OHS system needs to be carried out according to procedures starting from the stages of hazard identification, assessment, and hazard risks controlling (PP Number 52 of 2012 Regarding to SMK3). Therefore, it was utilized an appropriate preventive measures to minimize the occurrence of accidents and occupational diseases. Sahupala and Cipto (2019) added that OHS will provide a sense of safety in terms of physical and spiritual protection for workers. In the process of working, there are several factors that can trigger the occurrence of hazards such as coming from human negligence himself, inadequate and inappropriate equipments, raw materials containing hazardous substances or requiring special handling, inappropriate production processes, absence of operating standards, and the poor work environment (Ponda and Fatma, 2019).

The hazard identification process will produce an overview of the hazards posed by each stage of the work. Physical hazards, chemical hazards, mechanical hazards, biological hazards, electrical hazards, and ergonomic hazards can occur after carrying out a thorough hazard identification stage (Mayadilanuari, 2020). Potential physical hazards can occur due to dim lighting, hot work climates, and radiation from computer screens. Manufactured dust or powder is an example of a hazard. Mechanical hazards can take the form of scratches, pinches, injuries, falling on company materials and tools. Potential biological hazards come from insects, mosquitoes, gases or chemicals in the production raw materials. Incorrect sitting position and prolonged periods experienced by the operator or administrative personnel can result in ergonomic hazards. So et al (2019) showed that consultation to professional physiotherapists regarding postural habit at workplace gave positive results on patients with muscoskeletal disorders.

The potential hazard will then be assessed based on the level of given risk (Imran, 2020). The risk level is divided into three types, namely low, medium, and high, which are obtained after calculations related to the likelihood and consequence values. In the research that he conducted, the highest risk assessment results were at a moderate risk level of 52%, low risk 26%, and high risk 22%. After the work risk assessment stage, the risk control stage is applied to prevent risks that might occur. The systematic stages of work risk control are: elimination, substitution, engineering, administration, and the use of personal protective equipment (PPE).

In its application, OHS applies to companies with a minimum member of 100 employees or there are jobs with high risk level. On the other hand, it is necessary to implement labor protection measures that make workers comfortable, safe, and productive even though the company does not have 100 employees or does not have a high risk level. OHS staff are supposed to have a division or a differrent management to be integrated into the company's system. The person in charge of monitoring and implementing OHS for workers has an unit and members to functionally work (Fajrianti, 2020).

Occupational Health and Safety (OHS) Implementation on Occupational Diseases (PAK) in Factory Workers

Fajrianti (2020) describes that there are several factors that can be used to assess the relationship between monitoring the implementation of OHS to minimize occupational diseases (PAK) and work accidents based on worker knowledge, company attitudes, motivation, facilities and infrastructure, and policy commitments. The company's attitude that cares about the OHS system can be seen from the knowledge of its employees who are motivated by the company through the socialization provided, it should be strengthened by complete and proper personal protective equipment (PPE) for using by workers and fully supported by the company's policy commitment in implementing OHS.

Based on a survey conducted by Robinson et al (2020), it was proved that the physical burden of retired mining workers, and oil and gas extraction tends to affect their health levels higher than other retirees except for cancer. Retired mining workers had a significant prevalence value in hypertension, hearing loss, respiratory disorders, and had a low or poor health level, while oil and gas retirees had a significant prevalence value in hearing loss and had poor health levels than retirees from other occupations. Hearing loss was a PAK owned by retired mining and oil and gas workers due to the very loud noise from the company's machines.

Ergonomics in OHS also needs to be considered carefully because it can cause musculoskeletal disorders and worsen the health of workers which have an impact on decreasing the level of productivity and efficiency of workers in the field. Russo et al (2020) in their survey found that there was prevalence values for low back pain, shoulder pain, neck pain, pain in the upper and/or lower body of Italian workers. Furthermore, in the study, female workers tended to be more often affected by musculoskeletal disorders because of differences in biology, activity, and social. In addition to this, they also had an indication of a higher risk of exposure to chronic diseases than male workers. Health and safety training could be used to protect oneself from back pain and pain in the upper body which of course required preventive care strategies (Russo et al, 2020). According to So et al (2019), ergomotor intervention with the therapists supervision could aid to minimize the impact of incorrect repetitive body movement and body posture at work.

Ahyanti and Purwono (2019) in their study stated that there was a relationship between a history of skin disease, the level of personal hygiene, the provision and availability of clean water, and personal protective equipment to minimize PAK for workers in plantation and rubber processing companies. The previous skin diseases of the workers were triggered by the activities at work that made them to interact

with ammonia and ant acid without any protective equipment. Moreover, they were exposed to the chemical substance in the water by standing on it for ten-hours. Skin diseases are also included in the occupational diseases. Aalto-korte (2020) discovered that allergic contact dermatitis (ACD) are commonly occurred on the construction workers in Finnish as high as 70%. It was assumed that the allergic came from chrome and isothiazolinones substances. There was always a risk on the every occupation related to the factory workers, but there were occupational diseases that cannot be hindered such as hearing disorders due to the high level noise mining, oil and gas extraction section, and skin diseases from plantation and rubber company.

CONCLUSION

Several large companies have implemented OHS principles in accordance with existing regulations, but their implementation must still be monitored by checking the safety of workers, machines, tools, and the adequacy of personal protective equipment that is suitable to be used on a regular basis. There are several risks of occupational diseases that cannot be avoided because the impact can only be felt in the long term. For further researchers, they can use the application of OHS related to nurses or government workers variables by also examining age, gender, salary, which have an impact on occupational diseases or it could be by examining work accidents at the company.

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