

Noise Exposure Among Workers in Small-Medium Enterprise at Rembau, Negeri Sembilan

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Structured Abstract

Background: Noise is derived from the Latin word ‘nausea,’ defined as ‘unwanted sound’ or ‘sound that is loud, unpleasant or unexpected’. Noise is an undesirable sound and a waste of energy that is released by a vibrating body and induces hearing through nerves when it reaches the human ear. High noise levels are recognized as a potential hazard to workers. There is serious noise pollution in the workplace that handles cement and steel. The complexity of noise sources, particularly in the cement sector, is well known. One of the aspects of noise pollution in cement plants is the high noise pressure level. In this study, we will focus on the service and other sectors on the small enterprise. A small business is widely known as vulnerable to severe occupational noise but have minimal means to detect such risk. Moreover, workers of SMEs are exposed to great risk of occupational hazard with a lower ability to mitigate the hazard has become a problem faced by SMEs.

Methods: To fulfill the first aim, Noise levels should be measured using the same machine type or model at various points during the task or in different locations to capture the variation in noise levels. Noise levels must be monitored and recorded from all sources, including noise created by equipment, particularly those in the manufacturing industry. The measurement of noise source levels ensures that noise controls are prioritized. Most loud machines produce noise that is like the patterns outlined. Data collection is carried out using primary data in order to obtain more in-depth and accurate information about the research problem and to be able to fulfill the research objectives. The survey was adjusted and altered from earlier. To map the boundaries between various noise levels, sound level meters were used. Four distinct colors were used to indicate the zone areas. From the noise mapping result, the Hearing Conservation Program (HCP) will be developed to find out the zone that needs to wear Personal Protective Equipment (PPE). In cases when noise levels vary considerably over a short period of time, an estimate line may be plotted instead. The data analyses were done using Statistical Package for Social Science (SPSS). In this study, descriptive analysis was employed. Information such as the respondent's background, it is analyzed using mode, percentage, and mean. In order to achieve the second objective, which is to evaluate the perception of safety culture elements among workers at the workplace, calculating the mean and standard deviation were used as a measuring scale. The mean value is obtained based on the answer score.

Results: The source of noise at Point 1 comes from Air Compressor 1; the average noise level is 80.7 dB(A), while Point 2 is Air Compressor 2 with a noise level of about 84.1 dB(A). At Point 3, the noise level was about 66.8 dB(A) which comes from the motor fan. Next, the noise source is 89 dB(A). The highest noise level in the production area comes from Point 4, which is 95.3 dB(A) while the lowest is 66.8 dB (A). The source of noise for Point 5 is a metal cut-off saw, while the source of noise for Point 6 is an angle grinder. Next, the source of noise for Point 7 and Point 8 comes from the marble cutter and welding. An average noise level has been calculated for the production work area. For point 5, the noise fluctuates. The mean Leq observed were 97.8 dB(A), 85.3 dB(A), 85.1 dB(A) and 83.3 dB(A) respectively. The noise level in this work area is within the permissible limit as it stays between 83 dBA and 98 dBA. The summary of findings from the demographic of respondents. Over 71.4% of the

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workers were local. Table 1 depicts demographic characteristics as well as HPD use. More than 70% of workers reported using Hearing Protection Device (HPD). The relative frequency is 0.7. This means 71% of workers' age ranged between 25- 44 years whereas another 28 % were below 25 years. In terms of education, 28.6% (n = 2) of respondents had a high school certificate, while 42.9% (n = 3) reported having a diploma while another 28.6% had basic education. 14.3% (n=1) of respondents had worked there for fewer than a year, while 57% had spent between five and ten years working there. Risk perception substantially correlated with knowledge about hearing protection ($p = 0.45$), Hearing protection uses ($p = 0.07$), according to the correlations between a number of variables. The metal cut-off saws produce the noise with the greatest leading level (97.8 dBA), followed by the nozzle and angle grinder air supply with 89. 7dBA. For machines at Point 1, Point 2, Point 3, and Point 8, the noise level was between 66- 84.1 dB(A) and does not exceed the limit stated in the Occupational Safety and Health (Noise Exposure) Regulation 2019. It is necessary to take action in order to reduce noise in the areas where the noise levels were over the acceptable threshold.

Conclusion: The area of noise at the selected small medium enterprise (SME) has been identified and our data collected has shown that there is a concern with noise pollution in the work area that can affect workers' productivity. There are places with high and low noise levels, according to the noise mapping that was done using the data collected. The findings showed that from the noise assessment, the noise exposure level was between 66.4 dB(A) to 97.8 dB(A). About a quarter of workers also stated that they experienced daily conversation disrupted only as the noise level is at the medium stage only. According to the 2019 Occupational Safety and Health (Noise Exposure) Regulation, the daily noise exposure level is 85 dB(A). Workers are aware of the risk that hearing loss could occur over time if they are exposed to noise levels exceeding 85 dBA. However, we can see that many machines had more than 80 dBA. This is due to the type of work process that involves cutting the metals. Moreover, the company has operated for more than 10 years. Therefore, most of the equipment requires little maintenance and is outdated. This is one of the factors contributing to each machine's relatively loud noise output. In order to provide a favorable working environment and maintain employees' safety, health, and welfare, it is advised that management and workers take steps to lower the noise levels generated from work settings and adopt hearing conservation programs (HCP).

Keywords: Noise, Hearing, Noise Mapping, Risk Perception, SME

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