

Noise reduction to prevent hearing problems in workers

Abstract

Noise in the workplace is one of the most frequent occupational hazards for which almost all workers were once exposed to this condition.

Objective: Determine if preventive maintenance can reduce the noise to which workers are exposed. **Methodology:** Noise measurements were carried out with a previously calibrated 3M Sound Pro-SE Integrating Sound Level Meter before performing preventive maintenance on the machinery and after maintenance.

Results: An average of 71.8±9.6 dBA was obtained throughout the company. In the production area it was 86.9±5.2 dBA. After performing maintenance on the machinery, the average in the company was 70.1±8.7 dBA, and in the production area 81.9±8.1 dBA, being statistically significant $p=0.03$.

Conclusion: Preventive maintenance is of great importance since it gives us evidence that not only is the machinery functioning properly, but it also reduces the noise levels to which workers are exposed, reducing the probability of loss of work. hearing due to noise exposure.

Keywords: workers, machinery, reduce the noise, hearing loss, occupational diseases, mechanization of work

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Introduction

Exposure to noise is among the most common risks to which workers are exposed; recent studies show that at least 25% have had contact with noise at some point in their careers.¹ The prevalence of noise in the workplace and subsequent noise-induced hearing loss (NIHL) grew rapidly with the increase in mechanization of work processes.² Leaving hearing loss untreated can lead to difficulty communicating, stress, fatigue, and is associated with depression, dementia, and falls that end in hospitalization.³ Industrial noise exists in most companies as a result of the operation of machines and it is mainly those less equipped with technology that produce excessive noise. The NIHL, can only be prevented by eliminating or reducing the levels of noise exposure, being considered one of the most common occupational diseases and the second self-reported occupational injury. Fortunately, noise in the workplace is one of the easiest to prevent,⁴ that is why, the goal of this work was to determine if preventive maintenance can reduce the noise to which workers are exposed.

Methodology

A descriptive, longitudinal study was carried out to measure the noise level in the different work areas of an aerospace company, using a 3M Sound Pro-SE Integrating Sound Level Meter previously calibrated with the AcoustiCal AC-300. The noise levels were obtained from 7:00 a.m. to 5:00 p.m., all measurements were made before and after maintenance of the machinery. Once all the data was collected and captured, the information was analyzed with ArcGis 10.2.2 software, in its Arc Map extension. The sampling sites were located spatially by a UTM coordinate system WGS 84 projections. The data were analyzed with the t test for paired data in the origin 6.0 program considering significance with a p value ≤ 0.05 .

Results

Using the company's plans, the 72 sampling sites were located spatially by a coordinate system. In the first stage, an average value

of 71.8±9.6 dBA was obtained from the measurements throughout the company, once the after preventive maintenance of all machinery was carried out, a minimum decrease of 70.1±8.7 dBA was obtained ($p=0.001$). Since the reductions were found more notable in the production area (Figure 1), the values were analyzed obtaining 86.9±5.2 dBA before and 81.9±8.1 dBA after maintenance, this reduction being statistically significant ($p=0.03$), even though the work process involves beating of iron pieces.

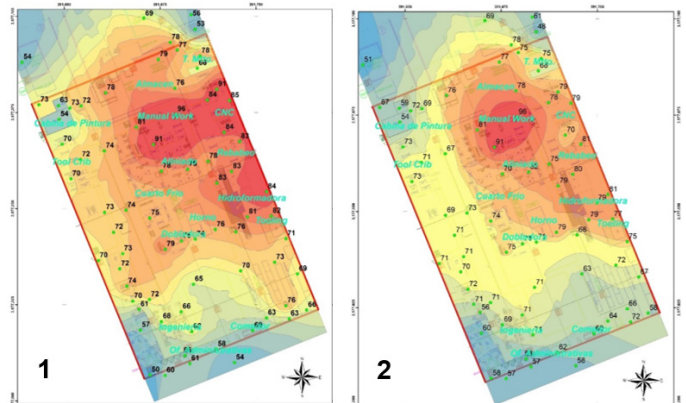


Figure 1 Noise measurements in decibels (dB A) before (1) and after (2) machinery maintenance.

Discussion and conclusion

The noise alone does not cause hearing loss if it is not higher than 75 dBA. In fact, if the exposure is temporary, normality is recovered in 16 to 48 hours. However, continuous exposure, such as in working conditions, to noise often leads to NIHL become permanent.⁵

Noise can provoke different auditory and extra-auditory responses in workers, depending on the frequency of exposure and intensity of the noise. We found that the production area is the most affected

by noise. The maintenance of machinery is an important part of the companies' agenda, since with this we are significantly reducing exposure to occupational risks and consequently reducing the probability of hearing loss due to exposure to noise.

Acknowledgments

None.

Conflicts of interest

The author declares there is no conflict of interest.

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