

Introduction The National Institute for Occupational Safety and Health (NIOSH) defines work related musculoskeletal disorders (WMSDs) as a group of disorders involving muscles, tendons and nerves. Symptoms of WMSDs are a common problem in the general population, and are considered the most common occupational disease causing limitations in daily activities. Even though there is an association between repetitive manual tasks, with short work cycles and force demanding tasks with the development of WMSDs, the particular cause of the physiological changes over a long period of time is a cause of debate. The study of the mechanisms underlying the physiological changes is essential for the early detection, diagnosis, and appropriate management of WMSDs.

Methods The study will include 30 healthy college students 18 year old and older with no previous history or exposure to repetitive or forceful tasks within the past eight weeks, and not receiving anti-inflammatory treatment. Participants will perform a manual task for 25 min daily for five days over a period of four weeks. A blood sample will be collected after the completion of the task on the fifth day. Blood serum levels of Interleukin 6 (IL-6), Interleukin 1 β (IL-1 β), Metalloproteinase 2 (MMP2) and Cyclooxygenase-2 (COX-2) will be measured using commercially available ELISA kits. Weekly levels of the biomarkers will be compared to baseline levels for significant differences.

Results Expected results of the study include an elevated expression of the targeted biomarkers before there is an inflammatory response, and an inflammatory response at the end of the intervention.

Conclusion The results of this study will help having a better understanding of the physiological changes resulting from repetitive manual tasks, and more importantly will provide the basis for the development of a rapid test to assess the risk to trigger an inflammatory response and prevent the development of WMSDs.

917 INJURED-BASED SPOT MAP AND ITS USE IN WORK DISABILITY PREVENTION

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Introduction Brazilian regulations oblige employers to prevent, track and make an early diagnosis of health problems related to work and to make a compulsory notification of occupational diseases. However, there is a great number of sub notification in Brazil, mostly due to ineffective programs of occupational hygiene and ergonomics. This paper suggests a strategy to make these programs more reliable for musculoskeletal condition prevention.

Methods This is a descriptive cross-section case study of an industrial plant in Nova Santa Rita, Rio Grande do Sul, Brazil. An intervention of Brazilian labour inspection due to a complaint of sub notification occurred in 2016, and secondary data source as official reports, ergonomic analysis and an injured-based spot map from 2010 to 2016 have been used. A spot map is used to display the location of each health-related state or event that occurs in a defined place and time. As an

evidence, it may highlight a possible link between injury and professional activities.

Results Non-notified musculoskeletal disorders and nerve injuries (101 cases) exceed the notified ones (52 cases) in 94,23%; in 4 of 15 industrial lines, the difference was even bigger: 210%. 13 non-notified cases had the same ICD-10 classification and workplace as 7 notified. An ergonomic study proved that non-notified injuries could be work-related, depending on individual anamnesis.

Conclusion Adopting a spot map is a strategy that helps the identification of worker's injury risks and the implementation of ergonomics solutions. It ends up preventing illness and minimising sub notification. By showing where injuries take place in a facility, occupational safety and health staff can prioritise control measures of identified ergonomics or other work-related risks. Authorities prerogatives, such as determine the alteration of working conditions to secure compliance with legal provisions on occupational safety and health, gain assertiveness if based on that organised data.

992 ERGONOMIC RISK EVALUATION IN AN AUTOMOBILE INDUSTRY FOR PREVENTING MUSCULOSKELETAL PROBLEMS

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Introduction A details ergonomics Risk assessment evaluation of some selected operation in an automotive plant was carried out. This evaluation was carried out with a view to assess the physiological cost of work among the operator during actual industrial operations, to assess the ergonomics risk factors at shop floor during actual operation with a view to minimise such risk factor through mechanisation or automation.

Methods Working heart rate of the workers were recorded manually to calculate the energy cost of work and workers ability to perform the shop floor operations. Risk factors were evaluated through extensive application of RULA and REBA at all pre-selected areas.

Results It could be observed from study that the mean working heart rate was found to be 112 \pm 1.3 beats.min⁻¹, oxygen uptake was computed to be 0.94 \pm 0.2 lit.min⁻¹. The concomitant energy expenditure was found to be 4.7 \pm 1.0 Kcal.min⁻¹ suggesting the job severity is varying from moderate to high. The sustainability of job @ 18.8 Kj.min⁻¹. Is well within physical capacity of operators. The average RULA score readings are varying from 3.43 \pm 0.84 suggesting that the immediate action is not warranted. The average REBA scale was found to be 4.32 \pm 0.89 which is in agreement with that of RULA.

Discussion The work stress, postural stress, and lifting index have shown positive results. The ergonomics risk factors is well within safe limits. Operators are safe, healthy and productive at this stage. The results of all three sections are assessed and the difference was not statistically significant thus the ergonomics risk factors are considered not serious can be continued. However any frequency (increase production) schedule change, distance variations as well as horizontal variations needs to keep constant in this present situation.