Characterization of Musculoskeletal Disorders in the manufacturing industry in Sonora Mexico

Enrique Javier de la Vega Bustillos, Francisco Octavio López Millán, Gerardo Meza Partida, Karla Patricia Lucero Duarte

*División de Estudios Superiores e Investigación, Instituto Tecnológico de Hermosillo, Hermosillo Sonora, MÉXICO; Departamento de Ingeniería Industrial, Instituto Tecnológico de Hermosillo, Hermosillo Sonora, MÉXICO

1. Introduction

Currently, more than half of the countries do not provide adequate statistics on occupational diseases and the available data relate mainly to injuries and deaths. This not only makes it difficult to identify specific injuries or diseases of men and women, but also hinders the development of effective measures for all prevention. Many countries have social security systems including compensation schemes for occupational accidents and diseases, however, its coverage is limited to workers in the formal economy, where it is not effective because systems for recording and reporting are deficient. Therefore, it is reported and indemnifies few number of occupational accidents. The situation regarding occupational diseases is even more complicated. In fact, in most countries, it is only covered a portion of the actual cases, reflecting the difficulty of definition, recognition and reporting. (ILO, 2013)

In Mexico there is little information and it is not well classified, as seen in the data submitted in 1998-2002 by the Instituto Mexicano del Seguro Social (IMSS, 2004) where it appears that the total of Musculoskeletal Disasters (MSD) were 217 for a total of 12,232,301 affiliates workers.

1.1 Objective

Given the lack of information it was decided to go to the original data source, the local medical units of the IMSS and identify the dependent and independent study variables and certificates injury cases were obtained and characterized it by number of lesions, type of injury by industry and gender.

On the other hand, 706 workstations representing 3543 operators of the manufacturing industry of Sonora were evaluated to determine the risk of MSD. This evaluation was done using the Rodgers Muscle Fatigue Analysis (Chengalur et all, 2004). Subsequently, the degree of correlation was sought between the two results.

2 Method

The research was limited to the years 2010-2014, and only for the manufacturing industry that is predominant in the region. The dependent variable was the MSD and the independent variables were: Classification of company, type and anatomical region of injury and gender. First, we have the IMSS data and moreover we have data obtained by the Rodgers method. With these data we may characterize the MSD of manufacturing industry of Sonora, in addition we can test the hypothesis of relationship between dataset

3 Results

In the period between the years 2010-2014 its shows the increase of MSD, from 84 in the year 2010 to 310 in 2014. The prevalence of injury is greater in women than in men. In the early years (2010-2012) the shoulder was the most affected part of the body, but in the entire series of years, the wrist has a positive trend that exceeds the shoulder in recent years. In reviewing injuries by industry can be seen that the wrist has prevalence in the electronics industry, the shoulder in the automotive industry, but MSD injuries decreased in the textile industry.
In addition, we are interested in testing the hypothesis that data from IMSS and data from Rodgers Muscle Fatigue Analysis are independent. Table 1 shows data obtained using Rodgers method. If we reject this hypothesis, we conclude there is some interaction between the two data set (Montgomery & Runger, 2003). So the result is:

Pearson chi-square = 14.162, FD = 4, P Value = 0.007

So we can conclude that there is a relationship between the two datasets. Another aspect that is of interest is to know the degree of relationship between the data sets. For this job is necessary to use the correlation coefficient (Montgomery & Runger, 2003) and is obtained a value of 0.758 indicating a weak relationship between both datasets.

4 Discussion

The lack of reliable information does not allow occupational health policies that reduce MSD and improve the quality of life of workers. Currently in Mexico the importance given to Ergonomics issues is very little when designing products or processes in manufacturing companies because there is no appropriate legislation and this lack of interest causes the growth of MSD. In 2015 it will be introduced the new Regulation of Health and Safety at Work, a federal law. This new law establishes the obligation for all companies to make a map for ergonomic risks (MSD) and an improvement plan, which would diminish the MSD in a short term.

References