

Occupational accidents in the manufacture of metal products for construction: descriptive analysis of its main variables

J.L. Fuentes-Bargues^{1*}, A. Sánchez-Lite², A. Romero-Barriuso³, B.M. Villena-Escribano³, C. González-Gaya³

¹ Project Management, Innovation and Sustainability Research Center (PRINS), Universitat Politècnica de València

² Department of Materials Science and Metallurgical Engineering, Graphic Expression in Engineering, Cartographic Engineering, Geodesy and Photogrammetry, Mechanical Engineering and Manufacturing Engineering, School of Industrial Engineering, Universidad de Valladolid

³ Construction and Manufacturing Engineering Department, National Distance Education University (UNED)

jofuebar@dpi.upv.es

Keywords: accidents rate, health & safety, Spain, metal products for construction

Abstract

Research on work accidents is important to determine the causes of occupational accidents to effectively prevent them in the future and improve workplace safety [1]. This kind of research must include the analysis of factors such as the technical and organizational conditions of companies, the adaptation of jobs to employees, and workers' attitudes toward occupational safety and health [2]. It is an essential first step in designing and implementing appropriate preventive measures to avoid similar accidents [3].

The metal sector is one of the productive sectors with the highest accident rate, both at the world, European and national level, as shown in the latest studies and research carried out in Spain [4-5]. Among the subsectors that make up the metal sector, the manufacturing of fabricated metal products for construction accounts for 30% of total and light accidents, 35% of serious and very serious accidents and 23% of fatal accidents. These important values require a more detailed analysis, which is the objective of this article. The aim is to explore the evolution of occupational accidents in the subsector of manufacturing of fabricated metal products for construction and analyse the relationship between the main key factors.

Data for the analysis are based on accidents in the subsector of manufacturing metal products for construction in Spain during the 2009-2022 period. This data comes from occupational accident reports, which are required to be sent to the relevant administrative body via the Delt@ (Electronic declaration of injured workers) IT system. The method used in this research is a descriptive analysis according to different variables. The study variables were selected from the official occupational accident forms according to similar studies [5-7]. The variables were grouped into five groups: temporal, personal, business, circumstances, and consequences.

The findings of this study can provide employers, workers, legislators, safety technicians, and researchers with valuable information to improve safety conditions at construction sites. This would help reduce the risk of minor, serious, or fatal accidents, thereby limiting the social and economic impact of such incidents.

References

- [1] Darda 'u Rafindadi, A., Shafiq, N., Othman, I., Ibrahim, A., Aliyu, M.M., Mikic', M., Alarifi, H. (2023). Data mining of the essential causes of different types of fatal construction accidents. *Heliyon* 9, e13389
- [2] Khanzode, V. V., Maiti, J., Ray, P. (2012). Occupational injury and accident research: A comprehensive review. *Saf. Sci.* 50, 1355–1367. <https://doi.org/10.1016/j.ssci.2011.12.015>
- [3] Salguero-Caparrós, F., Suarez-Cebador, M., Rubio-Romero, J.C. (2015). Analysis of investigation reports on occupational accidents. *Saf. Sci.*, 72, 329-336. <https://doi.org/10.1016/j.ssci.2014.10.005>
- [4] Díaz Aramburu, C. (2022). Informe de siniestralidad en el sector del metal. Instituto Nacional de Seguridad e Higiene en el Trabajo.
- [5] Fuentes-Bargues, J.L. Sánchez-Lite, A., González-Gaya, C., Rosales-Prieto, V.F., Reniers, G. (2022). A study of situational circumstances related to Spain's occupational accident rates in the metal sector from 2009 to 2019. *Saf. Sci.* 150, 105700. <https://doi.org/10.1016/j.ssci.2022.105700>
- [6] López-Arquillos, A., Rubio-Romero, J.C., Gibb, A., 2012. Analysis of construction accidents in Spain, 2003-2008. *J. Saf. Res.* 43, 381-388. <https://doi.org/10.1016/j.jsr.2012.07.005>
- [7] Suárez-Cebador, M., Rubio-Romero, J.C., Carrillo-Castrillo, J.A., López-Arquillos, A. (2015). A decade of occupational accidents in Andalusian (Spain) public universities. *Saf. Sci.* 80, 23–32. <https://doi.org/10.1016/j.ssci.2015.07.008>