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Latent class analysis for identification of occupational accident casualty profiles in the selected Polish manufacturing sector

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ABSTRACT

The objective of the analysis is identifying profiles of occupational accident casualties as regards production companies to provide the necessary knowledge to facilitate the preparation and management of a safe work environment. Qualitative data characterizing employees injured in accidents registered in Polish wood processing plants over a period of 10 years were the subject of the research. The latent class analysis (LCA) method was employed in the investigation. This statistical modelling technique, based on the values of selected indicators (observed variables) divides the data set into separate groups, called latent classes, which enable the definition of patterns. A procedure which supports the decision as regards the number of classes was presented. The procedure considers the quality of the LCA model and the distinguishability of the classes. Moreover, a method of assessing the importance of indicators in the patterns description was proposed. Seven latent classes were obtained and illustrated by the heat map, which enabled the profiles identification. They were labelled as follows: very serious, serious, moderate, minor (three latent classes), slight. Some recommendations were made regarding the circumstances of occupational accidents with the most severe consequences for the casualties.

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Izvirni znanstveni članek

Analiza latentnih razredov za prepoznavo resnosti delovnih nesreč v izbranem poljskem proizvodnem sektorju

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POVZETEK

Cilj analize je opredelitev profilov delovnih nesreč v proizvodnih podjetjih za pridobitev potrebnega znanja ter za lažjo pripravo in zagotavljanje varnega delovnega okolja. Predmet raziskave so bili kvalitativni podatki, ki označujejo zaposlene, poškodovane v nesrečah, zabeleženih v poljskih lesnopredelovalnih podjetjih v obdobju 10 let. V raziskavi je bila uporabljena metoda analize latentnih razredov (LCA). Ta tehnika statističnega modeliranja na podlagi vrednosti izbranih kazalnikov (opazovanih spremenljivk) razdeli nabor podatkov v ločene skupine, imenovane latentni razredi, ki omogočajo definiranje vzorcev. Predstavljen je bil postopek, ki podpira odločitev glede števila razredov. Postopek upošteva kakovost modela LCA in razločno ločljivost razredov. Poleg tega je bila predlagana metoda ocenjevanja pomembnosti kazalnikov v opisu vzorcev. Dobljenih je bilo sedem latentnih razredov, ki so prikazani s toplotno karto, kar je omogočilo identifikacijo profilov. Označeni so bili takole: zelo resni, resni, zmerni, manjši (trije latentni razredi), rahli. Podana so bila nekatera priporočila glede okoliščin nezgod pri delu z najhujšimi posledicami za poškodovance.

PODATKI O ČLANKU

Ključne besede:
Proizvodna industrija;
Nesreče pri delu;
Prepoznava resnosti nesreče;
Modeliranje;
Analiza latentnih razredov (LCA);
Analiza gruč;
Izbira modela

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