T66-14: A Neural Network-based Method for Automated Assessment of Wellbeing Based on Personnel Screening Questionnaires

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Keywords: personnel screening, well-being, neural networks

Introduction:
There is a need for objective, simple methods to assess employees' well-being. Currently, a healthcare professional assesses this partly using experience-based knowledge, making it difficult to use explicit rules to automate this task. We aimed to develop classifiers learning from data from questions in personnel screening questionnaires. Our goals were: a) to define an efficient subset of questions and b) to develop a classifier for well-being grading.

Methods:
Screening data from occupational health checks in a random selection of the working population in various parts of Finland were used. Data contained 98 answers on medication usage, pain experience, psychological factors, stress, lifestyle etc. A healthcare professional scored well-being on a scale from 1 to 3 (indicating seriousness in decrease of well-being). 1063 subjects were used. For a), relationships between variables were assessed using correspondence analyses. For b), linear and non-linear regression and neural networks (back propagation networks) were used with as input the variables found from a) and as desired output the well-being scores. Final performance was assessed using an independent test set of 89 subjects.

Results:
Significant correspondences between different questions were found. A subset of 9 independent questions proved to be efficient. These questions relate to weight, dizziness, sports activities, pain experience, views on life, and personal assessment of the ability to continue work. A neural network gave the best results with an accuracy of 83% on the test set, and sensitivity 85% and specificity 83% for separating 'reduced' from 'no reduced' well-being.

Discussion:
It is possible to construct a classifier for severity of decrease in well-being that is in good agreement with a healthcare professional's opinion. That performance can be obtained with a relatively small number of questions. This allows implementation of a classifier in quick-to-complete questionnaires that can be used routinely.

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T66-15: Assessing the Risk of Aggression to Emergency Health Workers

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Keywords: violence in the workplace; work accidents; emergency health workers

Introduction:
The term "violence in the workplace" refers to any physical aggression, threatening behaviour or verbal abuse occurring at work (NIOSH). The US Bureau of Labor Statistics estimates that non-fatal aggression among health workers (HWs) reaches the rate of 9.3/10,000, compared to 2/10,000 among workers in private industry. Accidents in Italian hospitals in 2005 amounted to 429, of which 234 involved nursing staff and 7 doctors in the following areas: emergency services, hospital and district psychiatric structures, waiting areas, geriatric services, continuous assistance services.

Methods:
This study was designed to assess the risk of aggression, in line with Italian and European regulations, among emergency health workers (EHWs) in the ARES 118 unit, in the Lazio Region. Aggression to the Unit workers during working hours was examined by analyzing incidents reported by them between 1 January and 31 December 2007; the quantitative risk was evaluated on the basis of variables such as the days off work for each episode, the total number of aggressive attacks, the type of health intervention involved, etc.

Results:
The rate of accidents related to aggression during working hours at the ARES unit was 6%, which is significantly higher than the figure of 2% reported for the entire healthcare sector. Quantitative analysis enabled us to design preventive measures to limit these episodes.

Discussion:
EHWs, working mainly outside hospitals in contact with users in an "uncontrolled" environment, and using a variety of techniques, exposes them to a substantial risk of aggression. Managing this risk, which calls for early assessment, can involve a series of preventive measures: appropriate worker training and information, specific tools and scales for monitoring and rating the risk, use of safety and surveillance devices and, when accidents occur, immediate treatment and support for the HWs involved.

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