

## Variable selection for latent class analysis with application to low back pain diagnosis

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The identification of most relevant clinical criteria related to low back pain disorders may aid the evaluation of the nature of pain suffered in a way that usefully informs patient assessment and treatment. Data concerning low back pain can be of categorical nature, in the form of a check-list in which each item denotes presence or absence of a clinical condition. Latent class analysis is a model-based clustering method for multivariate categorical responses, which can be applied to such data for a preliminary diagnosis of the type of pain. In this work, we propose a variable selection method for latent class analysis applied to the selection of the most useful variables in detecting the group structure in the data. The method is based on the comparison of two different models and allows the discarding of those variables with no group information and those variables carrying the same information as the already selected ones. We consider a swap-stepwise algorithm where at each step the models are compared through an approximation to their Bayes factor. The method is applied to the selection of the clinical criteria most useful for the clustering of patients in different classes. It is shown to perform a parsimonious variable selection and to give a clustering performance comparable to the expert-based classification of patients into three classes of pain.

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