

Data mining for the identification of metabolic syndrome status

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Abstract

Metabolic syndrome (MS) is a condition associated with metabolic abnormalities that are characterized by central obesity (e.g. waist circumference or body mass index), hypertension (e.g. systolic or diastolic blood pressure), hyperglycemia (e.g. fasting plasma glucose) and dyslipidemia (e.g. triglyceride and high-density lipoprotein cholesterol). It is also associated with the development of diabetes mellitus (DM) type 2 and cardiovascular disease (CVD). Therefore, the rapid identification of MS is required to prevent the occurrence of such diseases. Herein, we review the utilization of data mining approaches for MS identification. Furthermore, the concept of quantitative population-health relationship (QPHR) is also presented, which can be defined as the elucidation/understanding of the relationship that exists between health parameters and health status. The QPHR modeling uses data mining techniques such as artificial neural network (ANN), support vector machine (SVM), principal component analysis (PCA), decision tree (DT), random forest (RF) and association analysis (AA) for modeling and construction of predictive models for MS characterization. The DT method has been found to outperform other data mining techniques in the identification of MS status. Moreover, the AA technique has proved useful in the discovery of in-depth as well as frequently occurring health parameters that can be used for revealing the rules of MS development. This review presents the potential benefits on the applications of data mining as a rapid identification tool for classifying MS.

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