Parkinson's disease: network analysis of publications' activity

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Work of any researcher involves a continuous need to obtain information on research topics over the world. It is important to understand what has already been done and what is most relevant in the research thematic area. Such kind of information can be obtained using huge knowledge bases, however, new approaches to their analysis are required. The presented models of network analysis of publications on various aspects of Parkinson`s disease allow to reveal the links between research clusters, rank its importance and track changes. Recently developed network analysis algorithms including new centrality indices have been applied for publications databases on different aspects of Parkinson's disease. Articles with keywords "Parkinson's disease" were analyzed. Data were taken from Web of Science publications database and consist of more than 75000 articles dated from 1980 to 2017. Networks of publications are modeled as graphs, where the nodes are identification numbers (and other information, which can be received from the database), and the edges of the graph carry the information about the citations between them. New approaches and methods of centrality analysis are used to identify pivotal works. The key advantage of these approaches with comparison to existing methods is that we consider long-distance connections as well as special attributes of papers and group influence on them. This allows to detect hidden key publications: while classical measures detect explicit powerful works our methods also detect works that influence other papers in groups.