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Measuring the family physician's role in the health care for individual patients – results from a pilot study

Wolfram Herrmann, C Heintze

Charité-Universitätsmedizin Berlin, Institute of General Practice, Germany

Corresponding author: Dr Wolfram Herrmann, Charité-Universitätsmedizin Berlin, Institute of General Practice, Berlin, Germany. E-mail: wolfram.herrmann@charite.de

Background & Aim: What is the impact of primary health care and family medicine? This has been mainly researched in ecological studies so far. However, to prove the effect of primary health care on individuals' health, the family physician's role in health care provision has to be measured. The actual health care provider networks of individual patients can be derived from health care utilization data. Our approach is to measure the family physician's role in such health care networks. Therefore, we apply social network analysis to these networks of individual patients. Our goal was to assess the feasibility and validity of measures from social network analysis for the role of family physicians.

Method: We conducted a pilot study based on the individual networks of nine heterogeneous patient scenarios. For each patient's network, we computed seven different centrality measures for the assigned role of the family physician. These measures stem from social network analysis and measure the centrality of specific actors. Eight academic family physicians rated the centrality of the family physician in each of the networks on a scale from 0 to 1. The validity was checked by Pearson and Kendall correlation between the calculated measures and the expert ratings.

Results: For one case, Betweenness-Centrality could not be computed. Inter-rater-correlation was in mean 0.79. In both correlation measures, Betweenness-Centrality had the highest correlation ($r > 0.9$) and Kleinberg's Hub-Centrality the lowest correlation ($r > 0.55$).

Conclusions: Centrality measures from social network analysis show a high consistency with expert ratings on the role of family physicians in individual patients' health care provider networks. From the preliminary results, we favor Closeness-Centrality as a measure because it shows a good correlation with expert votes, is easy interpretable and can be calculated for all possible individual networks. Alternatively, a combination of Closeness and Betweenness-Centrality could be used.