A Social Network Analysis Perspective of Comorbid Conditions with Chronic Kidney Disease

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Introduction

Comorbidity presents health management challenges to patients, healthcare professionals and organizations at large. Comorbid patients impose a high treatment burden in terms of understanding and self-managing their conditions, attending multiple appointments, and managing complex drug regimens[1]. Kidney disease is a common condition that occurs in patients with other chronic medical problems or complications[2]. Therefore, providing support for self-management of chronic kidney disease is crucial to patient care. Social media is increasingly influencing people's daily life and their health behavior[3]. In particular, community Q&A sites provide a venue for generally asking questions and posting answers. However, researchers have yet to fully utilized Q&A sites to understand comorbid diseases and online patient community beyond what is already known in the healthcare setting. This study approaches the comorbid conditions that involve chronic kidney disease (CKD) through analyzing online Q&A data from a social network perspective.

Methods

We collected data from Quora, a popular community Q&A site. In addition to the questions, we also collected data based on the topics and subjects of the questions. We first compiled a list of topics related to the kidney disease using the snowball sampling strategy and then selected questions related to kidney disease, chronic kidney disease, kidney failure, dialysis, kidney-stones, polycystic kidney disease, CKD, dialysis patients, kidney infection, and pyelonephritis, etc. The dataset consisted of 1,312 questions in which were collected based on the selected topics. We grouped the topics into disease categories by mapping them to the general categories of ICD-10. The mapping results were further validated by a researcher with the medical background. Each node in the graph network represented a disease category and the size of the node indicates a higher weighted degree of the disase. The thickness of the edge indicates the strength of connection between two diseases that were mentioned along with CKD. We then used Gephi for analyzing and visualizing the disease network.

Findings

The network consisted of 42 comorbid diseases. The common comorbidities included in these findings were diabetes, hypertension, anemia, heart disease, depression, and thyroid disorder. The weighted degree were as following: diabetes= 80, hypertension=73, anemia= 31, heart disease= 21, depression=11, and thyroid disorder= 2. Hence, the two signficant comorbid diseases were diabetes and hypertension. The findings complement previous research that involved medical records for kidney patients discharged from hospital with comorbid conditions[4]. Thus, our preliminary results demonstrate that social media serves as a useful source of information for patients. The social network analysis revealed a promising perspective for uncovering and understanding the underlying common diseases associated altogether. Additionally, the results complement the existing body of knowledge based on clinical findings. At the end, our research helps to give more realistic view on the complex nature of comorbidity associated with CKD.

References

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