Team documentation influences clinic complexity and patient satisfaction

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ThreadNet is a novel, R coded, graph-theoretic methodology that converts threads of sequence data into event networks. We used ThreadNet to evaluate the impact of nurse "team documenters" on clinic visit routines and complexity. "Team documentation" is a new approach that enables clinical documentation of the visit in the electronic medical record (EMR) by a nurse assisting the physician. Ideally, team documentation should improve visit workflow for the physician. We applied ThreadNet to time-stamped audit data from EPIC EMR for 57,836 visits from five dermatology clinics at University of Rochester. Patient satisfaction ratings were calculated for each clinic using the mean CGCAHPS Summary Scores for the provider and clinic rating. Three clinics (Clinics A, B, C) utilized nurses (LPN) as "team documenters". Mean complexities were significantly lower in clinics with LPN team documenters, even after controlling for number of visits, unique diagnoses, physicians, and procedures per day (mean±SD: A=29.8±3.6; B=30.4±8.3; C=34.5±9.2 vs. D=53.3±10.5 and E=45.0±10.2; p<0.001). The percentage of actions performed by an LPN was drastically higher in Clinics A, B, and C (0.61, 0.21, 028 vs. 0.05 and 0.01; p<0.001). Average median wait times were lower in clinics with LPN team documenters (average median minutes: Clinics A, B, and C = 15.1 vs. Clinics D and E = 20.4). Patient satisfaction scores were higher for Clinics A, B, and C (mean±SD: A=94.5±3.3; B=91.3±1.6; C=86.9±4.9) utilizing LPN team documenters compared to Clinics D and E (D=71.6±5.4 and 73.8±7.3; p<0.001). We conclude that team documentation is associated with reduced visit complexity, decreased wait times, and greater patient satisfaction with clinical care. Overall, ThreadNet utilized EMR data to capture differences in clinic visit routines that can impact clinic efficiency. This work is supported by the National Science Foundation (SES-1734237).