SOCIAL NETWORK ANALYSIS FOR FAMILY MEDICINE EDUCATORS

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Family Medicine Focus

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Social network analysis (SNA) offers a way to explore relational dynamics in health care and educational settings.[1] By mapping **nodes** (individuals, groups, or institutions) and **edges** (interactions or relationships), educators can identify patterns of communication, collaboration, and resource flow; understand how these patterns shape behavior; and suggest interventions to achieve specific educational outcomes.

APPLICATIONS

- Study collaboration among learners, faculty, and interprofessional teams[2]
- Evaluate mentorship structures and their impact on learner development[2]
- Investigate diffusion of curricular innovations across departments[3]

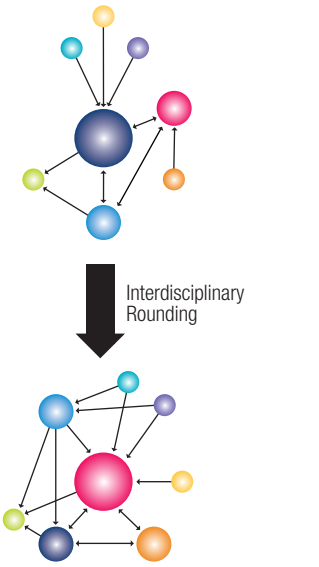
APPROACH

- **Defining the network:** Select **nodes** and specify **edges** based on the research question. Edges can be directed (connections between nodes have a defined direction) or undirected (connections between nodes that lack directionality)
- **Data collection:** Gather relational data via network surveys, interviews, or observational tools
- **Visualization:** Use tools (eg, Gephi, UCINET) to generate network graphs that reveal clusters and key personnel.
- **Metrics:** Choose individual-level metrics (eg, degree, betweenness, closeness, centrality) or network-level metrics (size, density, centralization, clustering) relevant to study objectives

DATA ANALYSIS

Metrics for family medicine contexts include:

- **Degree centrality:** identifies highly connected individuals
- **Betweenness centrality:** Measures brokerage roles by counting shortest paths passing through a node (eg, identifying gatekeepers)
- **Closeness centrality:** Assesses efficiency of information flow by averaging distances to all nodes
- **Network density:** Ratio of existing to possible edges; indicates overall cohesion
- **Centralization:** Degree to which connections focus on central person(s); reflecting hierarchy
- **Clustering:** Detects community subgroups within a network



STRENGTHS

- Visualizes interdisciplinary interactions across departments, roles, and institutions
- Enables longitudinal evaluation of interventions, showing changes in relational structures
- Highlights silos of underutilized and overutilized connections
- Supports targeted interventions, identifying highly connected individuals

WEAKNESSES

- Captures structure, but not quality or content
- Dynamic teams of rotating learners and faculty make interpretation difficult
- Requires contextual interpretation to translate metrics into action

THEORETICAL EXAMPLE

You choose to use SNA to assess the impact of interdisciplinary rounding on your inpatient family medicine service. You use pre- and postsurveys to identify connections your residents have during their inpatient rotation between interdisciplinary team members. Your results indicate that postintervention, family medicine residents showed a 45% increase in degree centrality, indicating more frequent connections across disciplines. They became key nodes in the network for clinical decision-making and discharge planning. Interprofessional clusters (eg, nursing-pharmacy-resident triads) became more prominent, reflecting improved interdisciplinary collaboration. The overall network density rose from 0.31 to 0.47, indicating a richer web of interactions.

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