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Title

Machine Learning Analysis of Serious Illness Conversations Predicts Patient Reports of Feeling Heard & Understood

Priority 1 (Research Category)

Big Data

Presenters

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Abstract

Context: The National Quality Forum recently endorsed the first Patient-Reported Outcome Performance Measure specifically for serious illness & end-of-life care, the degree to which seriously ill persons feel Heard & Understood by their clinical team. Scalable methods are urgently needed for large, diverse sample epidemiological studies to understand how conversation content and patient context foster environments where persons feel Heard & Understood. Objective: To develop and test a scalable algorithm that identifies both dominant and non-dominant conversation feature patterns (i.e., equifinality) of naturally occurring palliative care consultations that associate with patients feeling Heard & Understood in advanced cancer. Study Design and Analysis: Direct observation with patient self-rated outcomes. All patients reported the degree to which they felt Heard & Understood in the hospital environment the morning after the consultation. Setting or Dataset: Multi-site cohort study of directly observed hospital encounters at two geographically distant medical centers. Population Studied: 203 audio-recorded and transcribed naturally occurring hospital palliative care consultations involving unique patients with advanced cancer. Intervention/Instrument: We used an evolutionary algorithm (EA) to explore complex patterns in de-identified conversational dynamics (turn-taking and pause characteristics) that were associated with patients feeling more Heard & Understood post-consultation. Outcome Measures: Single-item, ordinal measure of feeling Heard & Understood in the hospital environment based on structure of Dartmouth COOP Charts. Results: Discrete patterns in conversational turn-taking demonstrated favorable Receiver Operator Curve parameters for distinguishing higher postconsultation ratings of feeling Heard & Understood. The EA achieved maximum sensitivity of 90.9% when using information from 6 discrete classes, maximum specificity of 73.3% when using 4 classes, and best balance in sensitivity (80.3%) and specificity (73.3%) when using 3 classes. Conclusions: An Evolutionary Algorithm can distinguish which patients will report feeling more Heard & Understood following palliative care consultation using de-identified measures of conversation dynamics.