BRIEF REPORT

Toward Spanning the Quality Chasm: An Examination of Team Functioning Measures

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Abstract

Objective: To examine the effect of 5 measures of team functioning on patient outcomes.

Design: Observational, exploratory, measurement. Team functioning surveys and patient outcomes collected 1 year apart in a clinical trial were analyzed. The findings are discussed in context of the domains of team functioning, team effectiveness, and quality improvement.

Setting: 27 Veterans Affairs medical centers.

Participants: Staff (t1: N=356; t2: N=273) on inpatient teams and patients (t1: N=4266; t2: N=3213) treated by the teams.

Interventions: Not applicable.

Main Outcome Measures: Five measures of team functioning (Physician Engagement, Shared Leadership, Supervisor Team Support, Teamness, and Team Effectiveness scales) and 3 measures of patient outcomes (functional improvement, discharge destination, and length of stay) were assessed at 2 time points with hierarchical generalized linear models to evaluate the association between team functioning measures and changes in patient outcomes.

Results: Associations ($P<.05$) between team functioning measures and patient outcomes were found for 3 of the 15 analyses over the study period. Higher Physician Engagement scale score was associated with lower length of stay ($P=.017$), and increased scores on Teamness and Team Effectiveness scales correlated with higher rates of community discharge ($P=.044$ and .049, respectively).

Conclusions: This exploratory analysis revealed trends that team functioning corresponds with patient outcomes in clinically relevant patterns. An increase in community discharge and a decrease in length of stay were associated with higher scores of team functioning. Here, we find evidence that modifiable attributes of team functioning have a measurable effect on patient outcomes. Such findings are promising and support the need for further research on team effectiveness.

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This study continues our examination of measures of team functioning. In a series of studies called the Veterans Affairs Rehabilitation Team Project, we developed measures of team functioning to describe the basics of team care that predict outcomes for patients with stroke,[1] and then used these measures as part of a staff training intervention in a national clinical trial of

process improvement.[2] This study provides evidence that team functioning can be modeled and studied empirically, team functioning can be measured reliably, aspects of team functioning predict patient outcomes, and training in team functioning correlates with greater functional gains in patients.[1-4] By using an exploratory analysis of data collected at 2 time points in the trial, here we examine the association of team functioning measures with the outcomes of all patients receiving inpatient rehabilitation services and discuss the findings in reference to our broader work on team effectiveness.

Five team functioning measures developed from our work have acceptable measurement properties, capture validated components

of team functioning,[3] and were selected to study. The Physician Engagement scale measures the extent to which the physician actively participates in and facilitates the work of the team. The Shared Leadership scale assesses the leadership function of teams consistent with a concept of leadership as arising from specific situations and the expertise of individuals, and less from the formal organizational structure. The Teamness scale emphasizes how well team members work together, whereas the Team Effectiveness scale gauges how well the team performs work. The Supervisor Team Support scale measures the support of a discipline-specific supervisor of a given team member with respect to team-based activities. The staff survey measures are 7 to 11 items in length and consist of Likert scales (1−7) for 4 measures and true-false responses for 1 measure (appendix 1).

Our research uses a conceptual framework, now called the Team Effectiveness Model,[4-6] in which the team mediates between system inputs (organizational culture, treatments/technology, and participants) and patient outcomes. In this model, team functioning derives from domains of leadership, managerial practices, social climate, and professional networks, and these domains serve as organizing principles for our initial work and the ongoing measurement development. In general, higher functioning teams have better patient outcomes.[1,2] In this analysis, we hypothesize that changes in team functioning measures predictive of patient outcomes will be consistent with the model (ie, patients treated by higher functioning teams have improved outcomes).

Methods

This is a secondary analysis of data collected from a cluster randomized trial in 29 Veterans Health Administration (VHA) medical centers.[2] As part of the trial, we collected pre- and postintervention staff surveys (t1=356; t2=273) and patient outcomes (t1=4266; t2=3213). Patient outcomes were extracted from the VHA Functional Status Outcomes Database and consisted of the first 13 items of the FIM,[7] length of hospital stay (LOS), and discharge to the community. In the current analysis, we assess whether the change in these team functioning measures was associated with changes in patient outcomes. For the original clinical trial, Human Subjects approval was obtained from the local VHA research committees and the affiliated institutional review boards (Clinical Trial Registration No.: NCT00237757).

Data

Representatives from medicine, nursing, occupational therapy, physical therapy, speech language pathology, and social work or case management who identified themselves as team members were eligible to participate. They were surveyed at 2 time periods 12 months apart (see Table 1 for demographic characteristics).

Survey responses were used to construct 5 measures of team functioning (Physician Engagement, Shared Leadership, Supervisor Team Support, Teamness, and Team Effectiveness scales). We used hierarchical generalized linear models (HGLMs) to assess the independent association of changes (from t1 to t2) in these 5 team functioning measures with changes in each of the 3 patient outcomes.

List of abbreviations:

HGLM	**hierarchical generalized linear model**
LOS	**length of stay**
VHA	**Veterans Health Administration**

Measures of team functioning

Because only t1 data were analyzed previously,[3] items on each scale were then evaluated for differential item functioning over time; 2 items showed differential item functioning and were eliminated.[8] These items were "How effective do you find your team to be at coordinating team activities" on the Teamness scale (previously called the Team Basics/Communication scale) and "How effective is your team leadership at promoting open discussion on conflicts and disagreements" on the Shared Leadership scale (previously called the Leadership scale). Subsequently, item response theory models described were refit.[9] Then, to assess the association between changes in team functioning measures (from t1 to t2) to changes in patient outcomes (from t1 to t2), we used HGLMs. Team scores for each team functioning measure were calculated at each time point by averaging scores over each team. (See appendix 1 for further details.)

Association with patient outcomes

We then estimated for each outcome and each team functioning measure an HGLM incorporating all patient observations at each site, including team functioning measure, time period, and their interaction as independent variables and controlling for patient function-related group[10] on admission. Linear response models were used for change in motor FIM score and LOS (log transformed); a logistic response model was used for discharge destination.

Results

The results of the HGLM analysis are presented in table 2; among the 15 models, only 3 found an association between change in team functioning measure and change in patient outcomes: there was an inverse relation between gains on the Physician Engagement scale score and LOS ($P=.017$) because increased gains in score on this scale predicted decreased LOS over the study period. In addition, gains in scores on Teamness and Team Effectiveness scales were

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Table 1   Respondents' characteristics

Characteristic	t1 (n=352)	t2 (n=273)
Age (y)	44.3±10.7	43.7±11.0
Sex: female	275 (78.1)	212 (77.7)
Years at facility	9.2±7.5	8.9±7.8
Years on team	5.1±5.2	5.1±5.3
Race/ethnicity		
African American	34 (9.7)	20 (7.3)
Asian	41 (11.7)	28 (10.3)
Hispanic	13 (3.7)	11 (4.0)
White	206 (58.5)	184 (67.4)
Other	7 (2.0)	4 (1.5)
Unknown	51 (14.5)	26 (9.5)
Professional training		
Occupational therapy	67 (19.0)	53 (19.4)
Physical therapy	72 (20.5)	73 (26.7)
Social worker/case management	28 (8.0)	21 (7.7)
Speech-language pathologist	30 (8.5)	23 (8.4)
Nursing	121 (34.4)	79 (28.9)
Attending physician	34 (9.7)	24 (8.8)

NOTE. Values are mean ± SD or n (%).