The Leadership Inventory for Medical Education (LIME): A Novel Assessment of Medical Students’ Leadership Skills

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Healthcare is becoming more team-oriented: healthcare workers need leadership skills
ACGME has called for leadership training (Swing, 2007). The Canadian Medical Association has called for more leadership skills in healthcare (Collins-Nakai, 2006).

We designed the LIME to measure healthcare workers’ leadership skills
A review of leadership literature in healthcare, business, and policy and interdisciplinary discussion of leadership identified 4 aspects of leadership:

- Communication: Sensitivity to others’ perspectives and ability to facilitate the sharing of ideas.
- Team Building: Ability to manage groups of people and fostering their effectiveness.
- Systems-Based Practice: Awareness of and facility with the policies and processes of healthcare.
- Problem-Solving: Facility with systematic approaches to identify and overcoming barriers.

4 Factor model fits the data
The 12-item LIME was derived from language defining the 4 aspects of leadership:
- 4-point frequency scale
- 3 items per subscale, intermixed
- Single page, approx 3 minutes to complete
- Paper or online

Each item measures an aspect of one aspect:
- Communication
- Systems-Based Practice
- Team Building
- Problem-Solving

Sub-scores correlate with other psychosocial measures
Significant correlations after correcting for familywise error (Holm’s step-down procedure within each LIME scale)

Total LIME score: Seeking Social Support (r = .27), Problem-Solving (r = .21), Emotional Stability (r = .30)

Communication: Positive Social Support (r = .29), Plural Problem-Solving (r = .23), Emotional Stability (r = .30)

Team Building: Seeking Social Support (r = .30), Positive Social Support (r = .25), Emotional Stability (r = .25)

Systems-Based Practice: Seeking Social Support (r = .32), Emotional Stability (r = .25)

Problem-Solving: Plural Problem-Solving (r = .17), Negative Social Support (r = .13)

Sub-scores correlate best with Team-Building

Communication correlates best with Team-Building

The LIME appears to be a reliable, scalable measure of leadership in healthcare contexts
The LIME is brief and broad. We are comparing qualitative information with these data to find further evidence of the validity of the LIME.

The LIME shows test-retest reliability and convergent validity in our sample of 660 undergraduate medical students from 4 cohorts at 4 curricular timepoints
These data serve as a baseline. As the University of Michigan adopts its new curriculum, we will continue to measure student leadership abilities over time. The LIME will be useful for assessing changes in leadership behavior at the individual and cohort levels.

Future directions
These results are from only one institution and the LIME is designed to measure leadership as defined by thought leaders at that same institution. Analysis of the LIME’s performance in other institutions would be informative.

The confirmatory factor analysis results could show a better fit. Some scale refinement may improve the instrument.

The LIME has only been used in undergraduate medical students. It should be effective for measuring leadership behaviors of residents, attendings, nurses, public health workers, and workers in other health domains.

These data are only quantitative. Qualitative work with high- and low-scorers will elucidate these findings and the usefulness of the LIME.

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