PSYCHOMETRIC PROPERTIES OF A SURVEY ON PATIENT SAFETY CULTURE (SOPS)-BASED TOOL FOR EMS

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BACKGROUND

METHODS  RESULTS  DISCUSSION  CONCLUSION

Disclosures

• None

Safety Culture

• Attitudes, perceptions, and behaviors of workers related to their organization’s commitment to safety.
• Related to safety outcomes including errors/adverse events.
• Monitoring safety culture is important in high-risk settings like EMS.

EMS Safety Culture Tool
## Safety Culture Measurement

- Two major instruments:
  - Safety Attitudes Questionnaire (SAQ)
  - Survey on Patient Safety Culture (SOPS™)

- Comparable psychometric qualities

- EMS-SAQ developed in 2008

- No SOPS™ instrument specific for EMS

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## Survey on Patient Safety Culture (SOPS™)

- Agency for Healthcare Research and Quality (AHRQ)

- Introduced in 2004 for hospital setting

- National comparative database

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## Objective

Evaluate the psychometric properties of an EMS-adapted safety culture measurement tool based on SOPS™ domains.
**Instrument Development**

- 10 domains from existing SOPSTM
- 1 new domain
- 37 items
- +2 outcome items
  - Overall safety grade
  - Frequency of event reporting

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**Design & Study Population**

- Design
  - Cross-sectional electronic questionnaire
- Target population
  - Nationally-certified EMS professionals
- Sample
  - All 332,584 nationally-certified EMS professionals

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**Data Analysis**

- Domain Structure
  - Confirmatory Factor Analysis (CFA)
    - Polychoric correlation matrix
    - Robust weighted least squares adjusted for mean and variance (WLSMV) estimator
- Reliability
  - Cronbach’s alpha (α)
- Validity
  - Pearson’s correlation coefficient (r)
**Analytic Sample**

- **EMS Safety Culture Tool**
- **Calibration**
  - Calibration Half: n=11,515
  - Calibration Half: Validation Half: n=11,514
  - Total Respondents: 23,029

**CFA Results: Model Fit**

- CFA supported the 11-domain model overall

<table>
<thead>
<tr>
<th>Variable</th>
<th>EMS Instrument</th>
<th>SOPS™ Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CFI</td>
<td>0.94</td>
<td>&gt;0.90</td>
</tr>
<tr>
<td>TLI</td>
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<td>&gt;0.90</td>
</tr>
<tr>
<td>RMSEA</td>
<td>0.08</td>
<td>0.05-1.0: acceptable fit</td>
</tr>
</tbody>
</table>
CFA Results: Factor Loadings

- Hospital SOPS™ Benchmark: >0.4
- Observed Factor Loadings: 0.51-0.98

Survey items are related to their assigned Safety Domains

CFA Results: Factor Variance

- Hospital SOPS™ Benchmark: >0.5
- Observed Factor Variances: 0.26-0.83

Safety Domains explain variation in respective survey item responses

CFA Results: Factor Variance

- 3 domains exhibited factor variance <0.5 threshold
  - Staffing (0.32)
  - Below 0.5 in Hospital SOPS™
  - Communication about incidents (0.26)
  - Demonstrated highest correlation with frequency of event reporting
  - Handoffs (0.26)
  - May be different in EMS
  - Occur between multiple organizations/cultures
CFA Results: Validation Data Set

• Comparable to calibration data set results

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<tr>
<td>Factor Variance</td>
<td>0.26-0.83</td>
<td>0.25-0.85</td>
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Reliability & Validity

• Reliability
  • Cronbach’s alpha > 0.6 for all 11 domains (range: 0.65-0.88)

• Validity

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<th>Outcome</th>
<th>EMS Instrument (range)</th>
<th>Hospital SOPS (range)</th>
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<td>Overall Safety Rating</td>
<td>(r: 0.44-0.72)</td>
<td>(r: 0.38-0.66)</td>
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<tr>
<td>Frequency of Event Reporting</td>
<td>(r: 0.31-0.48)</td>
<td>(r: 0.23-0.48)</td>
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Limitations

• Individual-level data
• Response bias
• Self-reported outcome variables
Conclusions

- Overall, EMS-adapted SOPSTM-based tool performed similarly to existing instruments.
- Future work is needed to explore properties of the tool at the agency level.
- EMS-adapted instrument will be freely available.

THANK YOU!