Using Hospital SOPS To Evaluate the Impact of Team Training in a Collaborative of 24 Critical Access Hospitals

Katherine Jones, PT, PhD and Anne Skinner, RHIA

April 20, 2010

12 CAHPS & 2nd SOPS User Group Meeting

Track: SOPS Survey Administration & Interpretation of Results
Session: Interpreting SOPS Data To Focus Improvement Efforts
Funded by

- AHRQ Partnerships in Implementing Patient Safety Grant (1 U18 HS015822)
- Nebraska Department of Health and Human Services
- AHRQ Office of Communications and Knowledge Transfer
  And
- Hospitals in Nebraska, Iowa, Louisiana
Our Team…Interdependent Skills

- Katherine Jones, PT, PhD…HSR
- Anne Skinner, RHIA…data management
- Robin High, MA, MBA…statistical support
- Andrea Bowen, BA…data entry
- Roni Reiter-Palmon, PhD…I/O psychology…interpretation of findings
Objectives

• Identify teamwork as an essential component of safety culture
• Describe a collaborative approach to implementing TeamSTEPPS in multiple Critical Access Hospitals (CAHs)
• Recognize adaptations to SOPS used to evaluate the impact of TeamSTEPPS training on safety culture
• Identify factors that impact evaluation of large scale patient safety improvement efforts
• Use Kirkpatrick’s Taxonomy of Training Criteria, Diffusion of Innovations theory, and the concept of “decision frame” to interpret longitudinal changes in SOPS results as a result of specific patient safety interventions
What is a Culture of Safety?

• Enduring, shared beliefs and behaviors that reflect an organization’s willingness to learn from errors *

• Beliefs present in a safe, informed culture**
  – Our processes are designed to prevent failure
  – We are committed to detect and learn from error
  – We have a just culture that disciplines based on risk
  – People who work in teams make fewer errors


Joint Commission Standards & Alerts

• Joint Commission 2010 Leadership Standards for hospitals (Standard LD.03.01.01)
  – Leaders create and maintain a culture of safety
  – Leaders evaluate the culture on a regular basis
  – Leaders encourage teamwork; they create structures, processes, and programs to support it

• Sentinel Event Alerts
  – Issue 40: Behaviors that undermine a culture of safety
  – Issue 43: Leadership committed to safety (9/09)

http://www.jointcommission.org/SentinelEvents/SentinelEventAlert/
Teamwork: Essential Component of safety culture

INFORMED = SAFE = HRO

SENSEMAKING

LEARNING

FLEXIBLE

JUST

REPORTING

TeamSTEPPS


Implementing TeamSTEPPS

- Rural collaborative training in 3 Cycles
  - April 2008 (24)
  - August 2009 (15)
  - April 2010 (19)

- Maintained community. . .monthly conference calls & annual “Lessons Learned” conference
  - Share TeamSTEPPS Tools
  - Share implementation strategies
  - Share Master Trainers

- Evaluation with rural-adapted Hospital Survey on Patient Safety (HSOPS) Culture

- 46 unique Hospitals 307 MTs
Implementation Cycle

Cycle I  2007 – 2009  24 CAHs
Cycle II  2009 – 2010  15 CAHs
Cycle III  2010 – 2011  18 CAHs

Evaluate Culture w/ HSOPS

TeamSTEPPS Train the Trainer

Lessons Learned Conference

Additional Training for Coaches

Supporting Calls
Diffusion of TeamSTEPPS in Nebraska

- NE TeamSTEPPS 39/65 CAHs, 2 Network Hospitals, 5 IA CAHs, 1 LA CAH
What impacts evaluation of improvement efforts?

• Implementation variability...program fidelity
  – Standardized training of TeamSTEPPS master trainers for 24 CAHs by UNMC
  – Variable implementation of TeamSTEPPS by master trainers within the 24 CAHs

• Baseline variability...how did the 24 trained CAHs differ in their pre-TeamSTEPPS HSOPS scores?
  – Organizations with low maturity in safety culture may gain more from a program than those with greater initial maturity
  – Standardized administration and interpretation of HSOPS by UNMC

Kirkpatrick’s Taxonomy of Training Criteria
Diffusion of Innovations
Decision Frame
EVALUATION FRAMEWORKS
Kirkpatrick’s Taxonomy of Training Criteria

RESULTS
(Patient & Organizational Outcomes)

TRANSFER
(Measurable aspect of job performance)

LEARNING
(Knowledge retention & skill demonstration)

REACTIONS
(Affective...did you like training? Utility...will you use training to make changes in practice?)

Safety Culture as measured by HSOPS

Items added to HSOPS to measure transfer/adoption of new behavior

Items added to HSOPS to measure learning/knowledge

Diffusion of Innovations—Framework to understand adoption/transfer of new behaviors

“Getting a new idea adopted, even when it has obvious advantages, is difficult...a common problem for many individuals and organizations is how to speed up the rate of diffusion of an innovation.”

The finding that perceptions of attitudes and behaviors are less positive after a training program is consistent with an altered “decision frame.”¹ A decision frame refers to the mental structures that people use to organize the world, and a key element of the frame is the reference point. ² If a reference point changes—such as knowledge of specific skills required to produce a desired behavior—then it is likely that respondents may be less positive than previously about attitudes and observed behaviors that are not consistent with their new frame of reference.

2. Wright G. Goodwin, P. Eliminating a framing bias by using simple instructions to 'think harder' and respondents with managerial experience: Comment on 'breaking the frame'. Strategic Management Journal, 2002;23:1059-1067.
SECTION H: Teamwork Skills

Please answer the following questions about your knowledge and practice related to teamwork. For each question, mark the ONE best answer. If you are unsure of an answer, please mark "Don't Know".

1. Indicate your experience in teamwork training.
   ○ a. I have no formal team training experience
   ○ b. I have some experience in team skills but not with the TeamSTEPPS program
   ○ c. I have completed SOME training in the TeamSTEPPS modules
   ○ d. I have completed training in ALL of the TeamSTEPPS Fundamental modules
   ○ e. I am a TeamSTEPPS Master Trainer

2. Which one of the following tools allows team members to assign roles, establish expectations, and discuss contingency plans for unusual circumstances?
   ○ a. Don't Know
   ○ b. Check-back
   ○ c. Debrief
   ○ d. Huddle
   ○ e. Brief
   ○ f. Call-out

3. SBAR provides a structured framework for communication among team members and stands for...
   ○ a. Don't Know
   ○ b. Situation, Background, Action, Recommendation
   ○ c. Situation, Background, Assessment, Recommendation
   ○ d. Situation, Behavior, Assessment, Results
   ○ e. Setting, Background, Action, Results
   ○ f. Status, Background, Action, Recommendation

4. Which one of the following tools allow any team member to speak up to those with more authority without provoking a conflict or confrontation?
   ○ a. Don't Know
   ○ b. Call-Out
   ○ c. CUS
   ○ d. STEP
   ○ e. Handoff
   ○ f. I PASS THE BATON

5. A nurse is setting up for a procedure and notices that the physician seems to be on the wrong side of the patient. This physician is often short tempered and has a history of not taking suggestions well. The BEST action for the nurse is to:
   ○ a. Don't Know
   ○ b. Call for a supervisor to come into the room and clarify
   ○ c. Observe and wait for the doctor to double-check
   ○ d. Observe and wait for the patient to correct the doctor
   ○ e. State her concern to the doctor and clarify why she is uncomfortable
   ○ f. Ask the doctor if he knows the correct side

Items 2 – 5 are internally consistent (alpha = 0.71)
<table>
<thead>
<tr>
<th>Item</th>
<th>Question</th>
<th>Never</th>
<th>Rarely</th>
<th>Sometimes</th>
<th>Most of the time</th>
<th>Always</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.</td>
<td>When people in your department communicate information that requires immediate attention and action, how often do they use a structured communication tool like SBAR?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>7.</td>
<td>When people in your department recognize that another member of your team is stressed, how often do they offer help?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>8.</td>
<td>When people in your department hand off information to a different department, how often do they use a structured communication tool such as SBAR or I PASS THE BATON?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>9.</td>
<td>When information or work loads change in your department, how often do team members call a huddle to adjust plans?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
<tr>
<td>10.</td>
<td>When things don't go according to plan in your department, how often does your team conduct a debrief afterwards to discuss what should be improved?</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
<td>☐</td>
</tr>
</tbody>
</table>

Items 6 – 10 are internally consistent (alpha = 0.83)
Results: Rural HSOPS Spring 2009

• Population Surveyed
  – 24 Hospitals evaluate impact of TeamSTEPPS Implementation 2008 – 2009 on HSOPS (n=2,137)
  – 13 Hospitals obtain baseline HSOPS prior to TeamSTEPPS Implementation (n=1,328)
  – Added Teamwork Related Items to HSOPS

• Response Rates
  – Aggregate 3465/4601 = 75.3%
  – Median for 24 Post-TS CAHs = 81%
  – Median for 13 Pre-TS CAHs = 76%
  – Range across 37 CAHs 51% - 96%

p=0.825 from Wilcoxon Two-Sample Test
Results: Does TeamSTEPPS Impact HSOPS?

HSOPS 2009 Composite Positive Responses for 24 CAHs Post-TeamSTEPPS Training and 13 CAHs Pre-TeamSTEPPS Training

- 10th %ile 2009 National Database
- 90th %ile 2009 National Database
- 24 Post-TS CAHs (n=2137)
- 13 Pre-TS CAHs (n=1328)

*Statistically significant difference between Pre- and Post-TeamSTEPPS Groups
WHAT ABOUT VARIABILITY OF IMPLEMENTATION AND BASELINE HSOPS RESULTS?
Categorize Trained CAHs by Adoption Status

Adoption of Team Behaviors in 24 Critical Access Hospitals

<table>
<thead>
<tr>
<th>Adoption Categories Based upon Five Team Behaviors</th>
<th>Number of CAHs</th>
</tr>
</thead>
<tbody>
<tr>
<td>False Start (2.8% - 9.2% of Staff Report Behavior)</td>
<td>6</td>
</tr>
<tr>
<td>Early/Late Majority (10.5% - 21.8% of Staff Report Behavior)</td>
<td>12</td>
</tr>
<tr>
<td>Early Adopter (22.2% - 31.0% of Staff Report Behavior)</td>
<td>6</td>
</tr>
</tbody>
</table>
How do “Adoption Groups” differ?

<table>
<thead>
<tr>
<th>Hospital &amp; Respondent Characteristics</th>
<th>6 Early Adopters (n=574)</th>
<th>12 Early/Late Majority (n=1195)</th>
<th>6 False Start (n=368)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Hospital Participation in 17 Support Calls</td>
<td>48.0%</td>
<td>51.0%</td>
<td>14.7%</td>
</tr>
<tr>
<td>Tenure at Hospital</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 5 yrs</td>
<td>42.3%</td>
<td>42.7%</td>
<td>36.6%</td>
</tr>
<tr>
<td>6 – 15 yrs</td>
<td>39.3%</td>
<td>30.6%</td>
<td>35.5%</td>
</tr>
<tr>
<td>16 + yrs</td>
<td><strong>18.5%</strong></td>
<td>26.7%</td>
<td>27.9%</td>
</tr>
<tr>
<td>Tenure in Profession</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 – 5 yrs</td>
<td>34.0%</td>
<td>27.3%</td>
<td>24.3%</td>
</tr>
<tr>
<td>6 – 15 yrs</td>
<td>36.1%</td>
<td>33.8%</td>
<td>32.5%</td>
</tr>
<tr>
<td>16 + yrs</td>
<td>29.9%</td>
<td>32.5%</td>
<td><strong>43.1%</strong></td>
</tr>
</tbody>
</table>

- Early Adopters & Early/Late Majority participated in ½ of calls
- Early Adopters have a smaller proportion of staff with 16+ yrs tenure at hospital than Early/Late Majority or False Start hospitals
- False Start hospitals have greater proportion of staff with 16+ yrs tenure in profession than Early Adopters or
Results: Variation in Implementation by Adoption Status

TeamSTEPPS Training, Knowledge, and Behavior for 24 CAHs
April 2009

- Completed Training in SOME/ALL TeamSTEPPS Modules
- Correctly Answered 3/4 TeamSTEPPS Knowledge Questions
- Reported Performing 4/5 Team Behaviors Most of Time/Always

<table>
<thead>
<tr>
<th>Adoption Status</th>
<th>Percentage Distribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early Adopter (n=6)</td>
<td>77% 42% 25%</td>
</tr>
<tr>
<td>Early/Late Majority (n=12)</td>
<td>59% 28% 16%</td>
</tr>
<tr>
<td>False Start (n=6)</td>
<td>32% 15% 6%</td>
</tr>
</tbody>
</table>

Legend:
- Black: Completed Training
- Gray: Correctly Answered
- Light Gray: Reported Performing 4/5 Behaviors

Early/Late Majority (n=12)
Informed: It is just by chance that more serious mistakes don’t happen around here.

Learning: Hospital management seems interested in patient safety only after an adverse event happens.

Learning: Mistakes have led to positive changes here.

Flexible: Problems often occur in the exchange of information across hospital departments.

Flexible: Important patient care information is often lost during shift changes.

Flexible: Staff feel free to question the decisions and actions of those with more authority.

Flexible: We work in “crisis mode” trying to do too much, too quickly.

Flexible: Staff worry that mistakes they make are kept in their personnel file.

Just: Staff worry that mistakes they make are kept in their personnel file.

Reporting: When a mistake is made, but is caught and corrected before affecting the patient, how often is this reported?
Generalized linear mixed models were used to account for the clustering of respondents within hospitals and repeated measurement of respondents over time.

RESULTS REVEAL FRAMING AND THAT ADOPTION OF NEW BEHAVIORS CHANGES CULTURE; NOT TRAINING OR NEW KNOWLEDGE IN ISOLATION
Results: Framing Effects

Change in HSOPS Percent Positive Scores for 24 CAHs by Post-TeamSTEPPS Adoption Status

- Reporting: When a mistake is made, but is caught and corrected before affecting the patient, how often is this...
- Just: Staff worry that mistakes they make are kept in their personnel file.
- Flexible: When one area in this department gets really busy, others help out.
- Flexible: We work in “crisis mode” trying to do too much, too quickly.
- Flexible: Staff feel free to question the decisions and actions of those with more authority.
- Flexible: Important patient care information is often lost during shift changes.
- Flexible: Problems often occur in the exchange of information across hospital departments.
- Learning: Mistakes have led to positive changes here.
- Learning: Hospital management seems interested in patient safety only after an adverse event happens.
- Informed: It is just by chance that more serious mistakes don’t happen around here.

*Statistically significant change p<0.05
EVERY 5% Increase in proportion of staff ADOPTING team behaviors is associated with an increase of 

- 20% in odds of responding that near misses reported “Most of time/Always”
- 11% in odds of disagreeing that “Staff worry that mistakes they make are kept in their personnel file.”
- 15% in odds of agreeing that others help out when it gets busy
- 11% in odds of agreeing that staff feel free to question decisions/actions of those with more authority
- 22% in odds of disagreeing that important patient information is lost during shift change
- 19% in odds of agreeing that “Mistakes have led to positive changes here.”
- 24% in odds of disagreeing that “Hospital mgt seems interested in patient safety only after an adverse event happens.”
- 25% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”
EVERY 5% Increase in proportion of staff KNOWING team skills is associated with an increase of ….

- 5% in odds of responding that near misses reported “Most of time/Always”
- 6% in odds of disagreeing that “We work in “crisis mode” trying to do too much, too quickly.”
- 6% in odds of agreeing that “Mistakes have led to positive changes here.”
- 7% in odds of disagreeing that “Hospital mgt seems interested in patient safety only after an adverse event happens.”
- 5% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”
EVERY 5% Increase in proportion of staff TRAINED in team skills is associated with an increase of ....

- 4% in odds of agreeing that “Mistakes have led to positive changes here.”
- 7% in odds of disagreeing that “It is just by chance that more serious mistakes don’t happen around here.”
Conclusions

• Adoption of team behaviors positively impacts all components of safety culture; esp. leadership support & organizational learning

• Training and new knowledge without adoption of new behaviors has less impact on culture; must use successful implementation strategies

• Evaluation of interventions intended to change safety culture requires measurement of implementation and baseline HSOPS variability

• Organizations with more mature safety cultures may gain less from an intervention than those with less mature cultures

• Changing frames of reference may create dissatisfaction & create the urgency to support future change

• Organizations resistant to change may have long term, passive employees that simply accept the status quo (Zhou & George, Academy of Management Journal 2001;44:682-696)
Need for Future Research

- Baseline HSOPS
- Train-the-Trainer
- Action Plan
- Support Implementation
- Evaluate Change in Knowledge and Behavior with HSOPS
- Determine Impact on Patient Level Outcomes

Determine Impact on Patient Level Outcomes → Baseline HSOPS → Train-the-Trainer → Action Plan → Support Implementation → Evaluate Change in Knowledge and Behavior with HSOPS → Determine Impact on Patient Level Outcomes
Contact Information

Katherine Jones, PT, PhD
kjonesj@unmc.edu

Anne Skinner, RHIA
askinner@unmc.edu

Web site where Rural-Adapted TeamSTEPPS SOPS is posted
www.unmc.edu/rural/patient-safety