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Quality of care and resource use among mechanically ventilated patients before and after an intervention to assist nurse-nonvocal patient communication

Mary Beth Happ, PhD, RN, FAAN [a,b,c,*], Susan M. Sereika, PhD [d], Martin P. Houze, MS [d], Jennifer B. Seaman, PhD, RN [b,c], Judith A. Tate, PhD, RN [a], Marci L. Nilsen, PhD, RN [c], Jennifer van Panhuis, BSN, RN [e], Andrea Scuilli, MS [g], Brooke Paull, MS, SLP-CCC [g], Elisabeth George, PhD, RN, CCRN [g], Derek C. Angus, MD, MPH [b,e], Amber E. Barnato, MD, MPH, MS [e,f]

[a] The Ohio State University College of Nursing, Columbus, OH, USA
[b] The CRISMA Laboratory (Clinical Research, Investigation, and Systems Modeling of Acute Illness), Department of Critical Care Medicine, University of Pittsburgh, Pittsburgh, PA, USA
[c] Department of Acute and Tertiary Care, University of Pittsburgh School of Nursing, Pittsburgh, PA, USA
[d] Department of Health and Community Systems, University of Pittsburgh School of Nursing, Pittsburgh, PA, USA
[e] Department of Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA, USA
[f] Department of Health Policy and Management, University of Pittsburgh Graduate School of Public Health, Pittsburgh, PA, USA
[g] University of Pittsburgh Medical Center, Pittsburgh, PA, USA

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ABSTRACT

Objectives: Implement and test unit-wide patient-nurse assisted communication strategies (SPEACS).
Background: SPEACS improved nurse-patient communication outcomes; effects on patient care quality and resource use are unknown.
Methods: Prospective, randomized stepped-wedge pragmatic trial of 1440 adults ventilated ≥2 days and awake for at least one shift in 6 ICUs at 2 teaching hospitals 2009–2011 with blinded retrospective medical record abstraction.
Main results: 323/383 (84%) nurses completed training; their communication knowledge ($p < .001$) and satisfaction and comfort ($p < .001$) increased. ICU days with physical restraint use ($p = .44$), heavy sedation ($p = .73$), pain score documentation ($p = .97$), presence of ICU-acquired pressure ulcers ($p = .78$), coma-free days ($p = .76$), ventilator-free days ($p = .83$), ICU length of stay ($p = .77$), hospital length of stay ($p = .22$), and median costs ($p = .07$) did not change.
Conclusions: SPEACS improved ICU nurses' knowledge, satisfaction and comfort in communicating with nonvocal MV patients but did not impact patient care quality or resource use.

Abbreviations: ICU: intensive care unit; SPEACS: "Study of Patient–Nurse Effectiveness with Assisted Communication Strategies"; MV: mechanical ventilation; SLP: speech language pathologist; EMR: electronic medical record; APACHE: Acute Physiology and Chronic Health Evaluation; NCS: Nurse Communication Survey; ITT: intention to treat.

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* Corresponding author. The Ohio State University, 378 Newton Hall, 1585 Neil Ave, Columbus, OH 43210, USA. Tel.: +614 292 8336.
E-mail address: aeb2@pitt.edu (M.B. Happ).

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Intubation for mechanical ventilation (MV) precludes the ability to speak. Thus, intensive care unit (ICU) patients who are placed on MV suddenly acquire a profound communication disability, which can be a source of distress, frustration, anxiety, and agitation.[1,2] Communication disability among nonvocal ICU patients reduces the accuracy of pain and symptom assessment,[3,4] predisposes patients to preventable adverse events,[5] and may lead to increased use of immobilizing treatments such as sedatives or physical restraint.

These negative patient outcomes may be ameliorated by assistive communication strategies, such as tagged yes-no questions, communication boards, hearing amplifiers, writing tools. Yet nurses in the ICU lack training in assistive communication strategies, readily available communication materials, and access to communication experts (e.g., speech language pathologists).[6] In a prior clinical trial of ICU nurse training in the use of simple assistive communication techniques, communication tools provision, and speech pathologist support, the "Study of Patient–Nurse Effectiveness with Assisted Communication Strategies" (SPEACS),[7] we demonstrated improved communication between individual nurses and their nonvocal ICU patients.[8,9] Secondary analyses also suggested a positive relationship between communication process and patient outcomes, such as pain management and sedation level.[10] The training format used in SPEACS – a 4-h small group workshop – limited the feasibility of dissemination.

The purpose of the current study was to translate the multi-component SPEACS program into a disseminable format (SPEACS-2: web-based ICU nurse training in assistive communication techniques, provision of "low tech" communication tools, and expert consultation), then evaluate prospectively whether unit-wide implementation of the SPEACS-2 could improve nurse knowledge, satisfaction, and comfort in communicating with nonvocal mechanically ventilated patients and thereby improve patient-level quality of care and resource use.

Materials and methods

Design

We received University of Pittsburgh Institutional Review Board approval for the study, including approval for a waiver of informed consent for medical record review. We conducted a randomized crossover cluster (stepped-wedge) quality improvement trial of unit-wide implementation of SPEACS-2 in 6 intensive care units (ICUs) at 2 teaching hospitals between August 2009 and July 2011. Data collectors were blind to the intervention assignment.

Intervention

The original SPEACS training involved a 4-h course consisting of interactive lecture with PowerPoint slides and video exemplars, demonstration, role-play and instructor feedback on performance of communication strategies.[7,8] To facilitate unit-wide, scalable dissemination, we modified SPEACS into SPEACS-2. The SPEACS-2 communication skills training intervention involved 1 h of on-line training, including video exemplars of communication techniques, for all bedside nurses (http://go.osu.edu/speacs2; see Table 1). Experienced and novice clinicians and assistive communication experts pretested the on-line training version of SPEACS for feasibility, acceptability, and content. The intervention also included the provision of communication supplies (e.g., communication boards, notebooks, felt-tip pens, clipboards, hearing aid batteries, etc.), and weekly bedside teaching rounds with a speech language pathologist (SLP) on the unit for a period of 25 weeks (2 quarters). Unit "poster" displays reviewing a different component of the training program each week reinforced learning. We randomized each ICU to a 3-month intervention period across 6 consecutive quarters (18 months) beginning on November 1, 2009, February 1, 2010, May 1, 2010, August 1, 2010, November 1, 2010, or February 1, 2011 (Fig. 1). As soon as we deployed the intervention in a unit, we gave nurses access to the online training and encouraged them to complete this self-directed training.

Table 1
Components of the SPEACS-2 Intervention.

Intervention components
1. Six 10-min on-line educational modules involving narrated text slides and video exemplars of communication assessment and techniques (60 min).
2. Reference manual, pocket reference cards, assessment – intervention algorithm.
3. Communication cart in the ICU containing assistive communication tools and materials.
4. Communication resource nurses (champions) – minimum of 2 per ICU.
5. Weekly teaching posters "communication strategy of the week."
6. Weekly patient case conference with Speech Language Pathologist.

We measured fidelity to the intervention (delivery, receipt and enactment) by tracking the number of eligible nurses who completed the on-line course, attendance at weekly communication rounds conducted by the SLP, change in scores on a 10-item pre- and post-test knowledge quiz, and use of communication tools and strategies assessed by communication supply inventory and randomly scheduled weekly observations for communication tools in the room, patient communication support in accordance with the assessment-intervention algorithm, and bedside use of a written communication plan.

Study ICUs

The six specialty ICUs included in this study were naïve to the SPEACS and SPEACS-2 programs at the study onset. The units included: NeuroTrauma, Transplant, Medical, Cardiovascular, Trauma, Neurological. All study ICUs provided 1:2 to 1:1 nurse – patient ratios and 12-h shift rotations. The Critical Care Medicine service provided attending physician coverage for all 6 ICUs across two different hospitals in the academic health system. The SLP role was limited to dysphagia consultations and swallowing evaluations; consultations for communication support were rare.

Participants

Nurse sample

The eligible nurse sample included all permanent full and part-time staff nurses assigned to the study unit at the time of intervention deployment. Unit nurse managers and clinical nurse specialists provided endorsement of the study, introduction and access to the unit nursing staff. Managers recommended 2–3 individuals to serve as "nurse champions." Nurse champions received an additional in-person introduction to the program and review of the communication cart by study staff. Nurse champions to then liaised with the research team and encouraged and supported unit nurses to complete the training program and use the communication tools.

Patient sample

We retrospectively identified all potentially eligible control (pre-intervention) and intervention cases from consecutive