Communication Training in Adult and Pediatric Critical Care Medicine

A Systematic Review

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ABSTRACT

Background: Interpersonal and communication skills are essential for physicians practicing in critical care settings. Accordingly, demonstration of these skills has been a core competency of the Accreditation Council for Graduate Medical Education since 2014. However, current practices regarding communication skills training in adult and pediatric critical care fellowships are not well described.

Objective: To describe the current state of communication curricula and training methods in adult and pediatric critical care training programs as demonstrated by the published literature.

Methods: We performed a systematic review of the published literature using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses checklist. Three authors reviewed a comprehensive set of databases and independently selected articles on the basis of a predefined set of inclusion and exclusion criteria. Data were independently extracted from the selected articles.

Results: The 23 publications meeting inclusion criteria fell into the following study classifications: intervention ($n = 15$), cross-sectional survey ($n = 5$), and instrument validation ($n = 3$). Most interventional studies assessed short-term and self-reported outcomes (e.g., learner attitudes and perspectives) only. Fifteen of 22 publications represented pediatric subspecialty programs.

Conclusion: Opportunities exist to evaluate the influence of communication training programs on important outcomes, including measured learner behavior and patient and family outcomes, and the durability of skill retention.

Keywords:
communication; medical education; fellowship; training; critical care

Communication skills are necessary for physicians to provide high-quality care and have been associated with improved satisfaction and clinical outcomes of patients and family members (1–9). In adult and pediatric critical care settings, physician communication skills are important to facilitation of family meetings, delivery of bad news, clinical consultations, and multi- and interdisciplinary care planning.

Given the importance of communication in clinical practice, the Accreditation Council for Graduate Medical Education (ACGME) has required fellowship programs to track and report learner development of "core competency" skills in communication since 2014 (10), with specific milestones including leadership of multidisciplinary care teams, facilitating family meetings, and communicating with patients (11).

Despite the essential nature of these skills, few studies have described communication training methodology in adult, pediatric, and neonatal critical care fellowship programs. Thus, we aimed to describe the landscape of structured communication training across subspecialty fellowships in adult and pediatric critical care medicine by conducting and reporting a systematic review of the literature.

METHODS

We used the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) checklist (12) to report the methods of this review. The published literature was searched for communication training of fellows in graduate medical education using strategies created by a medical librarian (M.D.). The search strategies used a combination of standardized terms and keywords, including (but not limited to) "fellowships," "fellows," "communication," "delivering bad news," "education," "training," and "ACGME competency surveys." Strategies were implemented in Ovid MEDLINE 1946–, Embase 1947–, Scopus 1960–, Academic Search Complete 1975–, Communications Abstracts 1977–, ERIC (ProQuest) 1966–, Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, MedEdPortal, and clinicaltrials.gov. All searches were completed in November 2018.

Results were exported to EndNote (Clarivate Analytics) for a total of 3,572 results (Figure 1). The automatic duplicate finder in EndNote was used, and 1,283 duplicates were assumed

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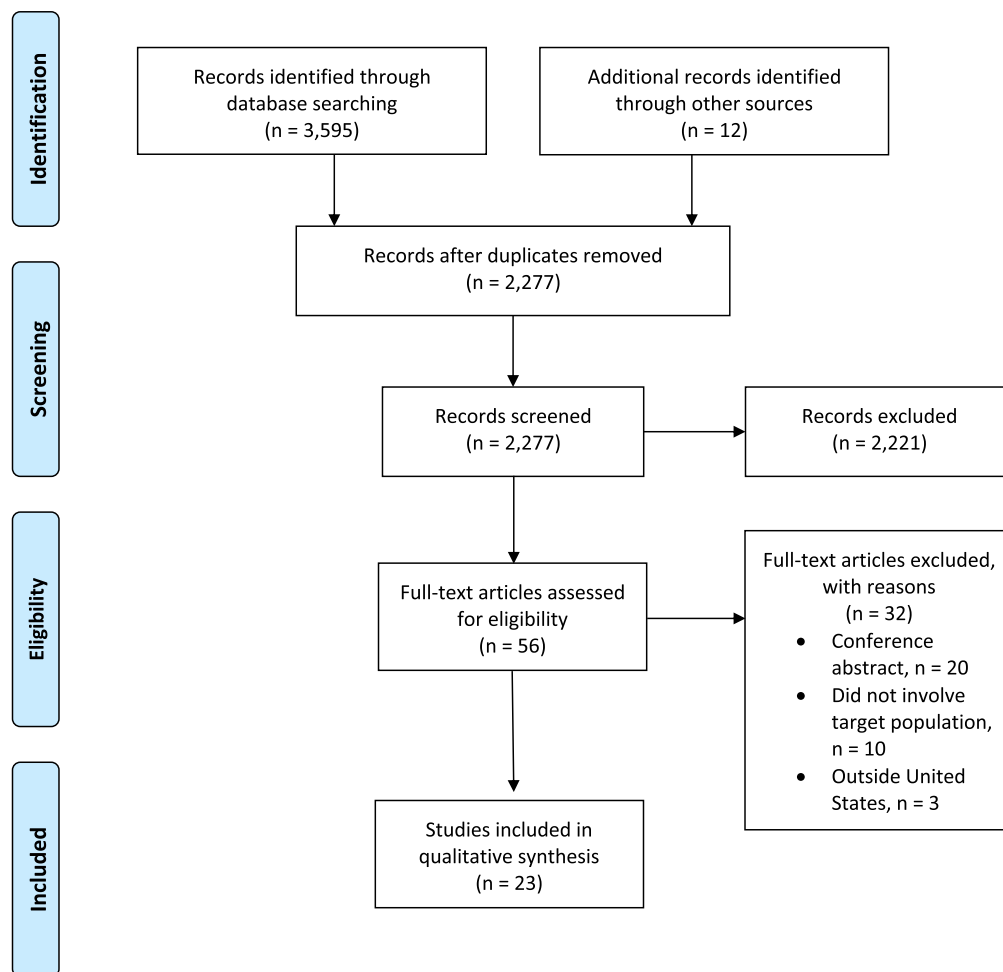
Figure 1. Preferred Reporting Items for Systematic Reviews and Meta–Analyses (PRISMA) inclusion diagram.

to be accurately identified; 37 duplicates were further identified by a medical librarian, for a total of 2,252 unique citations. An updated search was run in Ovid MEDLINE, Scopus, and Embase in February 2020 to include articles from MedEdPortal. In this search, 23 new citations were found; after removal of 10 duplicates, a total of 13 additional citations were evaluated. Full search strategies are provided in the data supplement.

Two reviewers (M.P.M. and H.P.) used Rayyan software (13) to screen article titles and abstracts on the basis of

inclusion/exclusion criteria (Table 1). Citations involving the population of fellows in critical care medicine in both adult and pediatric settings were included. Citations involving skills training and education in communication were included. Studies conducted outside the United States were excluded. Publication types were restricted to peer-reviewed publications and excluded review articles.

Screening identified 43 articles for full-text review. A member of the study team (J.T.) manually searched these articles' reference lists and identified 12 additional

Table 1. Eligibility criteria

Criterion	Inclusion	Exclusion
Language	English	Not English
Location	United States	Not United States
Type of article	Peer-reviewed journal article	Conference paper, abstract, not peer reviewed
Type of study	Quantitative (e.g., controlled studies or before–after studies); qualitative (e.g., surveys or interviews)	Reviews, commentaries (e.g., letters or editorials)
Focus of study	Communication training, as reported by authors	Communication training mentioned but not focus
Population	Adult and pediatric fellows in pulmonary and/or critical care subspecialties	Not fellow related (e.g., only residents, students, or faculty)

citations for full-text review. Of 54 full texts reviewed, 20 were conference abstracts, 2 were not performed in the United States, 6 did not have critical care fellows, and 4 did not specify whether any fellows were included. After these exclusions, a total of 23 articles met inclusion criteria.

RESULTS
Study Populations

The review included 23 articles published from years 1999 to 2018 (Table 2), of which 8 involved fellows in adult medicine (7 in pulmonary and critical care and 1 in surgical critical care) and 15 involved pediatric fellows (10 included neonatology fellows and 7 included pediatric critical care medicine fellows, with 3 including fellows from both pediatric critical care and neonatology programs). Nine articles included nonfellow participants (four included attendings, three included nurse practitioners, and three included residents). In total, 777 fellow participants were represented in the analysis; it was not possible to determine whether any trainees were represented more than once.

Cross-Sectional Survey Studies

We identified five cross-sectional survey studies in the literature review, all of which related to pediatric fellowship trainees. Three studies described the modalities used to describe communication training during fellowship. A survey of pediatric critical care and hematology-oncology fellowship graduates found that observing senior physicians (100%), direct observation with feedback (78%), reading (56%), and lectures (46%) were the most common teaching methods used, with role playing (20%), workshops (16%), and simulation (13%) used less frequently (14). Another study surveyed pediatric critical care fellowship program directors, similarly finding that faculty role modeling, direct observation with feedback, and didactics were the most common modalities used to teach communication (15). However, this study also found that 75% of the required elements of communication evaluated were not specifically taught by all programs. Finally, one survey of pediatric critical care fellows reported perceived deficiencies in all areas of communication education, including not being taught how to communicate as a member of a nonclinical

Table 2. Study characteristics and results

Authors	Participants	N	Design	Intervention	Completion (%)	Outcomes Measured	Study Results	Limitations
Arnold and colleagues, 2015 (27)	Adult pulmonary and critical care medicine fellows	38 total 38 PCCM fellows	Pre–post survey of self-rated communication skills	3-d communication skill workshop: 1) didactics with role playing, 2) simulation with standardized patients, and 3) informal practice	95	Self-assessed training and preparedness to communicate in family decisions	• Median self-ratings increased for all skills (P<0.001) but did not improve for self-assessments of a competency not taught in the workshop • Improvements in self-reported preparedness for communication tasks ranged from 69% to 92% • 1 mo follow-up surveys: 85% perceived comfort with all tasks	• Small sample size • Single institution • Potential selection bias • Self-reported outcomes • Short-term outcomes • Needs-standardized patients
Bateman and colleagues, 2016 (20)	Pediatric critical care fellows	13 total 6 PICU fellows 7 pediatric emergency medicine	Postsimulation semistructured interview	High–fidelity simulation	100	Descriptive themes based on interviews	• 85% of participants initiated end-of-life discussion* • 46% of participants asked about "doing everything"* • 23% of participants offered comfort care*	• Small sample size • Single institution • Potential selection bias • Focus on end of life
Boys and colleagues, 2014 (28)	Adult pulmonary and critical care medicine fellows	145 total 6 PCCM 114 internal medicine residents 17 NPs 8 other fellows	Pre–post skills assessment	Codetalk communication workshop with standardized patient simulation	52*	Observed specific communication skills (i.e., SPIKES or NURSE) in standardized patient encounter	• Scores improved for 8 of 11 coded behaviors* • Only intervention and study site predicted performance*	• Single institution • Potential selection bias • Skill checklist does not ensure performance quality
Boss and colleagues, 2009 (17)	Pediatric neonatology fellows	140 total 140 NICU fellows	Web–based national survey	None	72	Self-assessed training and preparedness to communicate in family decisions	• 41% recalled no communication skills training during fellowship • 46% recalled attending feedback after family meetings • Respondents believed fellows prioritize communication training more than faculty • 93% reported that communication training should be improved	• Self-reported outcomes • Potential recall bias
Boss and colleagues, 2012 (21)	Pediatric neonatology fellows	20 total 4 NICU fellows 6 NICU attending physicians 10 did not complete	Postsimulation semistructured interview and survey	Standardized patient simulation	50*	Descriptive themes based on interviews and qualitative inquiry	• Physicians focused on medical information but spent ∼25% of time building relationships* • 80% broached quality of life, but infrequently elicited parents' related values* • 60% declined requests for treatment recommendations, although 100% were certain about what should be done*	• Small sample size • Single institution • Short-term outcomes
Boss and colleagues, 2013 (32)	Pediatric neonatology fellows	13 total 5 NICU fellows 7 NPs	Pre–post survey	3-d communication skill course: 1) didactics with role playing, 2) simulation with standardized patients, and 3) informal practice	100	Self-assessed preparedness and competence in communication skills	• 85% had no prior communications training* • Mean perceived preparedness improved (2.6–4.5 on Likert scale; 5 = very well prepared)* • Use of new skills highly reported at 1 mo (mean Likert scores 4.3–4.7 for individual skills; 5 = a great deal)*	• Small sample size • Single institution • Self-reported outcomes • Short-term outcomes

Table 2. Study characteristics and results (continued)

Authors	Participants	N	Design	Intervention	Completion (%)	Outcomes Measured	Study Results	Limitations
Brock and colleagues, 2017 (23)	Pediatric critical care medicine fellows and NICU fellows	35 9 PICU fellows 6 NICU fellows 20 other pediatric fellows	Quasi-experimental pre–post: simulation vs. didactics	3 simulations and a videotaped panel	100	Pediatric Palliative Care Questionnaire, modified Kalamazoo Communication Assessment Tool, palliative care consultation rates	• Improved fellow comfort and perceived adequacy of communication education ($P < 0.005$)* • Short-term gains in communication skills were not sustained at 3 mo* • Palliative care consultations increased 64%	• Small sample size • Only two centers • Self-reported data • Potential selection bias
Brown and colleagues, 2018 (19)	Adult pulmonary and critical care medicine fellows	477 total 25 fellows† 192 internal medicine residents 32 NPs or NP students 228 did not complete	Randomized controlled trial	Codetalk communication workshop with standardized patient simulation	45	Self-assessed competence discussing palliative care with patients	• Improved overall self-assessment of competence in communication skills ($P < 0.001$)* • Improved self-assessment for three of four skills (express empathy, discuss spiritual issues, and elicit care goals; $P < 0.001$)*	• Only two centers • Potential selection bias
Calhoun and colleagues, 2009 (38)	Pediatric critical care medicine fellows and NICU fellows	7 total 5 PICU fellows 2 NICU fellows	Instrument validation	None	100	Interrater reliability Instrument validity Gap analysis	• Identification of 30 communication strengths/areas for improvement and 24 gaps, indicating self-underappraisals, 38% of which overlapped • Instrument was logistically feasible and well received	• Small sample size • Single institution • Focus on end of life
Gustin and colleagues, 2016 (39)	Adult pulmonary and critical care medicine fellows	16 total 16 PCCM fellows	Instrument validation	Simulated family meeting	100	Interrater reliability Instrument validity	• FMBSC showed internal consistency + structural reliability in assessing skills • Interrater reliability superior to SEGUE (ICC, 0.57 vs. 0.32)	• Small sample size • Single institution • Short-term outcomes • Skill checklist does not ensure performance quality
Harris and colleagues, 2015 (36)	Pediatric neonatology fellows	28 total 14 NICU fellows 9 NICU attending physicians 5 nurses	Pre–post survey of curriculum effectiveness	3-h lectures plus weekly multidisciplinary rounds	Unclear	Self-assessed comfort and familiarity	• 79% believed attending role modeling for end-of-life conversations was suboptimal* • 97% reported curriculum as useful* • Increased fellow knowledge of comfort care eligibility ($P = 0.03$)*	• Small sample size • Single institution • Focus on end of life
Hope and colleagues, 2015 (29)	Adult pulmonary and critical care medicine fellows	31 total 31 PCCM fellows	Development of formal communication skills curriculum: simulation and didactics	Family meeting simulations plus didactic lectures and case discussions	90	Self-assessed comfort Faculty-measured communication quality in simulations	• Improved agenda setting, summarizing meeting takeaways, and providing follow-up plan ($P < 0.03$) • 96% improved comfort with family meetings	• Small sample size • Single institution • Self-reported outcomes • No a priori testing of faculty raters • No pre/post blinding of assessors
Johnson and colleagues, 2017 (30)	Pediatric critical care medicine fellows	38 total 38 PICU fellows	Pre–post survey	3-d communication skills course: 1) didactics with role playing, 2) simulation with standardized patients, and 3) informal practice	100	Self-assessed training and preparedness to communicate in family decisions	• 70% had no prior training • Participants reported increased confidence discussing end of life, religious issues, and critical care ($P < 0.05$) • 90% recommended the course be required in fellowship	• Small sample size • Single institution • Self-reported outcomes
Kersun and colleagues, 2009 (14)	Pediatric critical care medicine fellows	345 total 158 PICU fellows 187 pediatric hematology–oncology fellows	Online survey (national)	None	50*	Recollection/perceptions of training experiences	• Respondents had varying prior experience with observation (78%), literature (56%), didactics (46%), role playing (20%), workshops (16%), and simulation (16%)* • Only workshops associated with feelings of preparedness ($P = 0.02$)*	• Potential response bias • Potential recall bias

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Table 2. Study characteristics and results (continued)

Authors	Participants	N	Design	Intervention	Completion (%)	Outcomes Measured	Study Results	Limitations
Lechner and colleagues, 2016 (22)	Pediatric neonatology fellows	28 total 28 NICU fellows	Pre–post survey	Simulated family meetings + didactic curriculum	89	Self-assessed preparedness and competence in communication skills	• Simulations were rated very positively • Simulation group reported increased comfort • Simulation group more frequently acquired strategic pauses and body positioning	• Small sample size • Single institution • Self-reported outcomes • Potential recall bias • Potential response bias
McCallister and colleagues, 2015 (31)	Adult pulmonary and critical care medicine fellows	16 total 16 PCCM fellows	Quasi-experimental pre–post: novel curriculum vs. historical control	Workshop + simulated family meetings + didactic curriculum	100	Family Meeting Behavioral Skills Checklist (blinded trained objective observer) Self-Confidence in Communication Skills Survey	• Intervention group displayed improved communication skills vs. preintervention (51–65% total observed skills; $P < 0.01$) and historical control subjects (49% total observed skills; $P < 0.01$) • Intervention group reported improved self-confidence (77–89%; $P < 0.01$)	• Small sample size • Single institution • Short-term outcomes • Skill checklist does not ensure performance quality
Orgel and colleagues, 2010 (18)	Pediatric critical care medicine fellows and neonatology fellows	453 9 PICU fellows 6 NICU fellows 88 pediatric residents 51 other fellows 299 pediatric attending physicians	Online survey (single center)	None	80*	Self-assessed preparedness, competence, and knowledge in communication skills.	• 73% of trainees reported "less than adequate" quantity of formal teaching* • 60% of fellows assessed their knowledge as insufficient • 85% of fellows reported comfort delivering bad news* • Barriers described included lack of time, training emphasis, attending physician modeling, trainee interest, and resources	• Single institution • Self-reported outcomes • Focus on breaking bad news
Janice–Woods Reed and Sharma, 2016 (26)	Pediatric neonatology fellows	Not specified	Description of curriculum and pre–post survey	Simulation	Not reported	Self-reported comfort	• Average self-reported comfort improved from 5.8 to 7.5 on 10-point Likert scale	• Unknown sample size • Unknown completion rate • Self-reported outcomes • Potential selection bias • Focus on bad news conversations
Sawyer and colleagues, 2017 (24)	Pediatric neonatology fellows	12 total 3 NICU fellows 9 NICU attending physicians	Pre–post survey	Workshop with simulated family meeting	83*	Self-assessed competence with antenatal counseling	• 90% perceived improved counseling quality at 3 mo*	• Small sample size • Single institution • Self-reported outcomes • Potential selection bias • Focus on antenatal counseling
Schmitz and colleagues, 2008 (37)	Adult surgical critical care fellows	19 total 2 critical care fellows 17 surgical residents	OSCE validation	None	100	Internal consistency Interrater reliability Discriminant validity	• ICC range 0.912–0.952 across groups (self-rated, clinician rated, and family raters)* • Interrater reliability ranged from 74% to 82%	• Small sample size • Single institution • No trainee outcomes
Turner and colleagues, 2013 (15)	Pediatric critical care medicine program directors	66 total NA	Online survey (national)	None	67	Self-reported modalities used to teach ACGME requirements	• 75% of communication elements were not specifically taught by all programs • Faculty role modeling and direct observation were the most common modalities used to teach communication for 88% of required elements	• Self-reported outcomes • Potential recall bias • Potential response bias

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Table 2. Study characteristics and results (continued)

Authors	Participants	N	Design	Intervention	Completion (%)	Outcomes Measured	Study Results	Limitations
Turner and colleagues, 2015 (16)	Pediatric critical care medicine fellows	283 total 283 PICU fellows	Online survey (national)	None	47	Self-reported engagement in ACGME/ABP requirements for communication teaching	• Trainees reported deficiencies in formal teaching in all 11 areas of communication assessed (e.g., nonclinical communication "not formally taught" for 24%) • A wide range of techniques to teach communication were reported by fellows, with direct observation by faculty (65%), conferences (64%), and faculty role modeling (63%) most commonly cited • Fellows perceived faculty role modeling (29%), direct observation by faculty (23%), and simulation (23%) as most effective ways to teach communication	• Self-reported outcomes • Potential recall bias • Potential response bias • Does not address prior training
Vaidya and colleagues, 1999 (25)	Pediatric critical care medicine fellows	7 total 7 PICU fellows	Self-controlled crossover study	Role playing standardized patients	100	Standardized patient feedback External rater communication performance across five categoriesPatient Perception Questionnaire	• Improvement in overall communication performance and in each communication category (P < 0.01)	• Small sample size • Single institution • Short-term outcomes • Unclear minimally important difference for some measures

Definition of abbreviations: ABP = American Board of Pediatrics; ACGME = American College of Graduate Medical Education; FMBSC = Family Meeting Behavioral Skills Checklist; ICC = intraclass correlation; NA = not applicable; NICU = neonatal ICU; NP = nurse practitioner; NURSE = name emotion, understand emotion, respect the patient, support using powerful words, explore emotion; OSCE = objective structured clinical examination; PCCM = pulmonary and critical care medicine; PICU = pediatric ICU; SEGUE = set the stage, elicit information, give information, understand the patient's perspective, end the encounter; SPIKES = six-step protocol to deliver bad news (set up, assess perception, obtain invitation, give knowledge, emotions and empathy, summarize strategy).
*Not possible to differentiate fellow results from those of other participants.
†Not possible to differentiate PCCM fellow results from those of other fellows.

group (24%), across socioeconomic and cultural backgrounds (19%), or in consultation outside the intensive care unit (17%) (16).

Two studies explored perceptions of communication training. One survey of neonatology fellows found that 94% of fellows were "sometimes" or "always" responsible for leading family meetings, but only 40% of fellows recalled attending physician presence at these meetings and feedback to fellows (17). In addition, 14% of respondents reported never receiving feedback from any attending physician after any family meeting. Finally, a survey of pediatric residents, fellows, and attending physicians at an academic hospital reported that trainees believed they were insufficiently knowledgeable to deliver bad news independently (18). This study also elicited barriers to effective education from respondents, which included time constraints, lack of educational emphasis, lack of positive modeling, and limited awareness of existing resources.

Interventional Studies

Fifteen studies in this review directly examined interventions to improve communication skills. One was a randomized controlled trial (19) comparing a multisession workshop with no intervention, and the remaining studies had pre–post designs. Seven studies evaluated training experiences based on simulation and/or standardized patient/family encounters (20–26). An additional seven studies described multicomponent workshops or curricula, many of which involved combinations of didactic lectures, role playing, and simulation (19, 26–32). Notably, five (19, 27, 29–31) of these seven studies involved workshops based on training objectives and content from the VitalTalk program (33), a well-

known communication training program for clinicians that has been adapted to specialties, including oncology (34) and nephrology (35) as well as critical care (27).

All of these studies reported at least one improved outcome in the intervention group. Outcomes reported were heterogeneous and included both self-reported outcomes (10 studies reported self-reported comfort, competence, or preparedness [19, 22, 24–27, 29–32, 36]) and demonstrations of behavior change (five studies reported scored simulation encounters, with some overlap [23, 25, 28, 29, 31]). Interventions were reported as well received in essentially all studies.

Only 3 of the 14 studies evaluated whether communication training interventions impacted long-term outcomes. One study found that a 3-day communication skills course led to a high self-report of participants using workshop skills at 1 month (32). After a similar multiday training course, another study found that perceived comfort with difficult communication was high, both immediately after the course and at 1 month (27). Finally, another group found that short-term gains in objectively measured communication skills measured on the day of the course were not present 3 months later by the same format (23).

Instrument and Process Validation Studies

Three studies evaluated the validity and reliability of tools and processes that may be used to assess the communication skills of critical care fellows during simulated patient encounters. One study found that observed structured clinical encounter ratings of communication-focused vignettes were reliable across groups and

adequately discriminative (37). Another study reported the development and testing of a multirater assessment paired with a gap analysis for evaluating pediatric critical care trainees' communication skills; this group described strong utility and feasibility of this process (38). Another group described the creation and validation of the Family Meeting Behavioral Skills Checklist and compared it with the existing SEGUE Framework (set the stage, elicit information, give information, understand the patient's perspective, end the encounter) (39, 40). The Family Meeting Behavioral Skills Checklist had

Table 3. Barriers to training fellows in communication skills

Authors	Barrier
Boss and colleagues, 2009 (17)	Needs active simulation center
Calhoun and colleagues, 2009 (38)	Needs active simulation center
Harris and colleagues, 2015 (36)	Lack of dedicated palliative care language
	Poor attendance by on-service physicians
Hope and colleagues, 2015 (29)	Need dedicated faculty
Lechner and colleagues, 2016 (22)	Lack of emotional support from clinical mentors
	Time constraints
	Trainee's fear of the process
Orgel and colleagues, 2010 (18)	Time constraints
	Lack of role models
	Lack of educational emphasis
	Limited awareness of existing resources
	Administrative interest
Janice-Woods Reed and Sharma, 2016 (26)	Time constraints
Schmitz and colleagues, 2008 (37)	Needs active simulation center
Vaidya and colleagues, 1999 (25)	Cost

strong consistency and better reliability than the SEGUE.

Barriers to Communication Training

Most studies describing interventions commented on barriers to training fellows in communication skills. The most commonly described barriers included time constraints, resource limitations (in particular, active simulation centers), and faculty with relevant training and expertise (Table 3).

DISCUSSION

Our review identified 23 published studies regarding the training of adult and pediatric critical care medicine fellows in communication skills. The majority (63%) of studies described interventions that included simulation with trainee self-perception of acquired skills as an endpoint. A minority (22%) of studies used instruments designed to objectively quantify trainee acquisition of skills. This finding is particularly notable, given the importance of these skills for critical care physicians in clinical practice and the existence of ACGME core competency and milestone requirements for training programs in these fields. It is also worth noting that there are almost twice the number of studies of the pediatric training programs as there are of adult programs, despite a smaller footprint of pediatric programs and trainees nationally.

Perhaps most surprisingly, no cross-sectional assessment of adult critical care medicine fellowship training practices in communication skills exists. Such an examination would be an important opportunity to characterize how programs currently train and evaluate fellows in this area and to align them with existing training milestone and core competency standards. Moreover, given the need for high-quality

communication skills in most fields, a clear understanding of effective and sustainable programs to teach durable communication skills would likely be desirable for interprofessional educators of many backgrounds. Finally, although we constrained our search to publications specific to critical care training programs, there are many examples of existing communication skills curricula within other medical specialties (e.g., palliative medicine certificates) that might have applications for critical care training programs.

Gaps Identified

Many of the included studies provided, overall, low levels of evidence for the interventions they described. All were small, and many were conducted in a single center, which may limit their generalizability. Furthermore, most measured self-reported perceptions rather than objective skills, which may increase bias, limit interpretation of results, and restrict generalization to objective performance. Only one study described the effects of an educational intervention on clinical performance, and most focused on low-level learning objectives at the first Kirkpatrick level (41). Thus, one gap identified is the need for more objective outcomes about measured learner behavior, ideally including patient and family outcomes.

Most studies did not assess the durability (retention over time) of their intervention's impact on communication skills. For example, several studies described the use of similar multicomponent, multiday workshops. In addition, although the standardization and scalability of these programs may be a strength, none of the studies reported data on sustainability (ability to provide continued support) of these interventions over time. Thus, evaluation of the durability of learned skills over time as

well as the sustainability of communication training in these programs is an important gap in the studies in this review.

Last, three studies used validated rating tools to objectively rate a trainee's acquisition of communication skills. These tools offer a more robust method of assessment that can be useful in assessing competency in an objective and longitudinal manner. However, it is unlikely that the use of these tools is widespread or standardized across training programs. Thus, another gap is the lack of broader national consensus on the necessary tools to measure competency among programs and the core communication skills required to deem a fellow competent.

Strengths and Weaknesses

Our review has multiple strengths. First, to our knowledge, this is the first systematic review on the important topic of communication skills training for either adult or pediatric critical care fellows. In addition, we adhered to PRISMA guidelines and used rigorous methodology to identify and screen articles, including our search strategy and the use of snowballing to identify additional articles. Finally, we used a novel software program to facilitate abstract screening and ultimate determinations related to article inclusion or exclusion.

Our findings should also be interpreted in light of our review's limitations. First, because of the small number of studies identified, we were unable to consolidate results for quantitative evaluation. The small number of studies we found may also reflect publication bias. Second, to maximize the number of articles to be evaluated, we chose a broad scope for our review within critical care subspecialties: We did not specify the domain of communication being studied (e.g., clinician–patient, clinician–clinician, or clinician–interdisciplinary), nor did

we restrict our review to only adult or pediatric trainees. Although this broad scope may limit consistency among included works (i.e., we evaluated instrument validation studies, cross-sectional surveys, and interventional studies), it does offer the advantageous perspective of multiple specialties. Given the similarities in critical care practice, regardless of patient age (e.g., multidisciplinary rounds, the need to consult with clinicians across the spectrum of disciplines, and the need to conduct delicate conversations involving prognosis and bad news), results from one critical care subspecialty may very well apply to others. Finally, our review was unable to ascertain details of relevant communication skills training not reported in the included studies; for example, multidisciplinary teamwork curricula such as TeamSTEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety) (42) may be part of some hospitals' or training programs' culture and may not be studied as specific educational interventions in communication training.

In conclusion, the majority of communication skills training programs for critical care fellows described in the literature are simulation-based interventions that demonstrated improvements in learner confidence and short-term skill acquisition. There is no existing data on what specific skills are important to achieve competency or how to maintain and grow those skills over time. There is a need to better describe the current state of communication skills training in graduate medical education to define which outcomes are important and what specific skills need to be taught to meet those outcomes. We conclude that important next steps in this area may involve

evaluating objective performance of communication skills, adapting and evaluating well-developed programs from other fields (e.g., VitalTalk), characterizing and addressing important barriers to the implementation of effective communication skills training curricula, and linking these curricula to important patient- and family-centered outcomes.

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