


ORIGINAL



Key mechanisms by which post-ICU activities can improve in-ICU care: results of the international THRIVE collaboratives

Kimberley J. Haines^{1,2*}, Carla M. Sevin³, Elizabeth Hibbert⁴, Leanne M. Boehm⁵, Krishna Aparanji⁶, Rita N. Bakhru⁷, Anthony J. Bastin⁸, Sarah J. Beesley^{9,10,11}, Brad W. Butcher¹², Kelly Drumright¹³, Tammy L. Eaton¹², Thomas Farley¹⁴, Penelope Firshman¹⁵, Andrew Fritschle¹⁶, Clare Holdsworth⁴, Aluko A. Hope¹⁷, Annie Johnson¹⁸, Michael T. Kenes¹⁹, Babar A. Khan²⁰, Janet A. Kloos²¹, Erin K. Kross²², Belinda J. MacLeod-Smith²³, Pamela Mactavish²⁴, Joel Meyer¹⁵, Ashley Montgomery-Yates²⁵, Tara Quasim^{24,36}, Howard L. Saft²⁶, Andrew Slack¹⁵, Joanna Stollings²⁷, Gerald Weinhouse²⁸, Jessica Whitten¹⁶, Giora Netzer^{29,30}, Ramona O. Hopkins^{10,31,32}, Mark E. Mikkelsen³³, Theodore J. Iwashyna^{34,35} and Joanne McPeake^{24,36*} 

© 2019 The Author(s)

Abstract

Objective: To identify the key mechanisms that clinicians perceive improve care in the intensive care unit (ICU), as a result of their involvement in post-ICU programs.

Methods: Qualitative inquiry via focus groups and interviews with members of the Society of Critical Care Medicine's THRIVE collaborative sites (follow-up clinics and peer support). Framework analysis was used to synthesize and interpret the data.

Results: Five key mechanisms were identified as drivers of improvement back into the ICU: (1) identifying otherwise unseen targets for ICU quality improvement or education programs—new ideas for quality improvement were generated and greater attention paid to detail in clinical care. (2) Creating a new role for survivors in the ICU—former patients and family members adopted an advocacy or peer volunteer role. (3) Inviting critical care providers to the post-ICU program to educate, sensitize, and motivate them—clinician peers and trainees were invited to attend as a helpful learning strategy to gain insights into post-ICU care requirements. (4) Changing clinician's own understanding of patient experience—there appeared to be a direct individual benefit from working in post-ICU programs. (5) Improving morale and meaningfulness of ICU work—this was achieved by closing the feedback loop to ICU clinicians regarding patient and family outcomes.

*Correspondence: Kimberley.haines@wh.org.au; Joanne.mcpeake@glasgow.ac.uk

¹ Department of Physiotherapy, Western Health, Sunshine Hospital, Melbourne, Australia

²⁴ Glasgow Royal Infirmary, NHS Greater Glasgow and Clyde, Glasgow, Scotland, UK

Full author information is available at the end of the article

Disclaimer This does not necessarily represent the views of the U.S. government or Department of Veterans Affairs.

Conclusions: The follow-up of patients and families in post-ICU care settings is perceived to improve care within the ICU via five key mechanisms. Further research is required in this novel area.

Keywords: Post-intensive care syndrome, Intensive care unit follow-up clinics, Peer support

Introduction

Recognition of adverse post-intensive care unit (ICU) outcomes has prompted clinicians to extend their practice beyond the physical location of the ICU [1–4]. In some settings, this post-ICU care takes the form of ICU follow-up clinics [1, 3, 5] or peer support programs [2, 6]. Such post-ICU programs have been coordinated by the Society of Critical Care Medicine's (SCCM) THRIVE initiative [7].

Most reports of post-ICU programs focus on the mechanisms by which such programs benefit patients and families dealing with ICU survivorship. However, an expert panel suggested that ICU care itself might change if clinicians knew more about outcomes beyond ICU discharge [8].

Yet no multi-center studies have identified generalizable mechanisms by which post-ICU programs could deliberately and systematically drive improvements in the quality of care delivered in the ICU. The aim of this study was to identify such mechanisms. It began using as a data source the perspectives of clinicians delivering post-ICU programs. We took advantage of the unique opportunity presented by the SCCM THRIVE Initiative to systematically probe for such feedback mechanisms among post-ICU programs in diverse health systems on three continents.

Methods

Setting and ethical approval

The institutional ethics committee of the principal investigator (KH) approved the study (HREC/17/WH/170) and consent was implied through participation.

Study design

Qualitative inquiry was used to understand complex phenomena of post-ICU care [9, 10]. We chose qualitative inquiry rather than structured site surveys because there was scant prior literature on which to formulate close-ended questions, and we wished to hear participants describe their experiences in sufficient detail, that we could identify common underlying mechanisms.

Participants, sampling and recruitment

Participants were recruited from the in-person meetings of the THRIVE collaborative sites for follow-up clinics

Take-home message

ICU recovery programmes may offer benefits across the entire critical illness journey, for both clinicians and patients.

and peer support, at the 2018 SCCM Annual Congress. Congress was chosen as a point for data collection as it presented a unique opportunity to bring the international multidisciplinary research team together in-person. Purposive sampling strategies were employed to understand a range of experience within a variety of post-ICU programs.

The THRIVE collaboratives were established by the SCCM in 2017 (Post-ICU Clinic) and 2015 (Peer Support), to bring together critical care clinicians working to improve patients' and family members' outcomes. It was advertised internationally and has recruited new sites over the last 4 years, with four recruitment waves for the Peer Support Collaborative and two for the Post-ICU Clinic Collaborative.

Within the THRIVE Collaborative, six general models of peer support are utilised and represented within this study: Community based models; Psychologist-led outpatient models; Models based within ICU follow-up clinics; Online models; Group-based models based within ICU and peer mentor models [2]. All programs involved in the THRIVE Post-ICU Clinic collaborative utilized a multi-disciplinary team approach.

Data collection and generation

Data were collected via two separate, in-person focus groups with each collaborative. Sites not represented at the in-person meeting were purposively sampled and interviewed via video conference ($n=2$). Participants were informed of the focus groups prior to the Congress meetings and invited to participate on the day of the meeting.

A semi-structured interview guide was used (Supplementary File 1), with prompting questions. Questions were generated by examining previous literature and through iterative discussion with the research group. The guide was externally reviewed by a senior qualitative research expert. Data were audio-recorded and transcribed verbatim.

Data analysis and rigor

Framework analysis was used to analyze the data [11]. There are seven stages to framework analysis: (1) transcription; (2) familiarization with the interview; (3) coding; (4) developing a working analytical framework; (5) applying the analytical framework; (6) charting data into the framework matrix; (7) interpreting the data [11].

Two researchers (KH, EH) undertook preliminary sweeps of the data to familiarize themselves with the content and develop initial coding. The data were grouped manually. The two researchers then jointly developed a working analytical framework [11]. The analytical framework with the major themes identified was rechecked against the preliminary analyses and raw data and final supporting quotes were selected (Supplementary File 2). To ensure rigor, regular crosschecking of analyses and data was undertaken by the research team (KH, JM, EH, CS). Full review of the analysis and presentation of the paper, was undertaken by an ICU family member, who also served as an author on this paper (BM).

The lead researchers (KH, JM, EH, CS) had monthly meetings to discuss any issues related to study conduct and analysis. The researchers were previously involved in the collaboratives and, therefore, known to members.

Role of the funder

This analysis was funded by the SCCM. The scientific questions, analytic framework, data collection, and analysis were undertaken independently of the funder. The Executive Council of SCCM reviewed the manuscript and offered input regarding readability and presentation, prior to finalization.

The Consolidated Reporting of Qualitative Research (COREQ) checklist [12] was used for this study.

Results

Overall, 28 participants contributed data: 11 and 15 participants from the peer support and post-ICU clinic focus groups, respectively (Table 1), and a further two peer support participants via follow-up interviews (unable to attend Congress). These contributors collectively represented various international sites (United States, United Kingdom, and Australia) and professions (nursing, medical, allied health).

Each focus group lasted between 60 and 90 min. A wide variety of experiences were available during the focus groups, with some sites having more prior experience of post-ICU programs, than others (Supplementary File 3). There was good representation from each THRIVE collaborative, with 11 out of 15 sites for the peer support collaborative and 10 out of 10 sites for the post-ICU clinic collaborative, present (Table 1). There was

Table 1 Participant demographics

| | ICU follow-up clinic (n = 15, participants) | Peer support (n = 13, participants) |
|---|--|--|
| Age (years), mean (SD) | 41.3 (8.6) | 44.1 (8.7) |
| Gender, n (%) male | 7 (46.7) | 3 (23.1) |
| Years of practice in critical care (years) Mean (SD) | 11.1 (6.9) | 16.3 (10.4) |
| Discipline, n (%) | | |
| Medical | 8 (53.3) | 6 (46.2) |
| Nursing | 2 (13.3) | 4 (30.8) |
| Pharmacist | 4 (26.7) | 1 (7.7) |
| Allied health | 1 (6.7) | 2 (17.4) |
| Sites represented, n (%) of total collaborative sites | 10 (100) | 11 (73) ^a |

^a 11 out of 15 available sites were sampled, with no response for follow-up interview from the remaining four sites

representation from all prior recruitment waves of the THRIVE collaboratives.

The working analytical frameworks were first developed separately for follow-up clinics (Fig. 1) and peer support (Fig. 2); commonalities were further identified via framework analysis (Fig. 3). The quotes presented acknowledge the area where the information emerged from (Supplementary File 2).

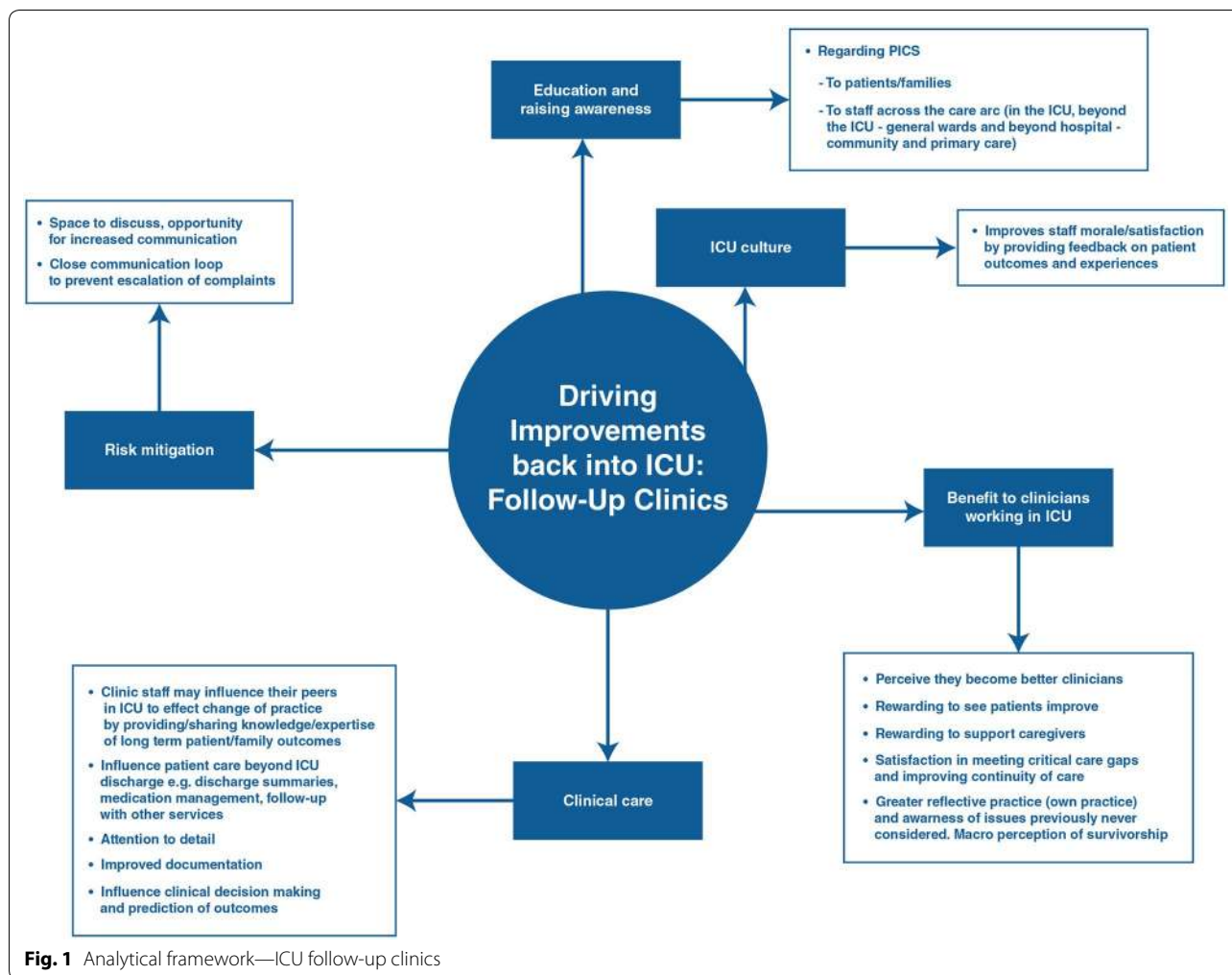
We identified five key mechanisms by which post-ICU activities have resulted in perceived improvements in care in the ICU: three at a formal/organizational level, and two at an informal/intra-clinician level (Fig. 3).

Formal/organizational mechanisms to drive improvements back into the ICU

1. Identifying otherwise unseen targets for ICU quality improvement or education programs

Through caring for patients in post-ICU programs, participants noted aspects of care that mattered to patients and their families, but which they had not previously considered important. For example, they prompted colleagues to include important details in ICU discharge summaries:

Clinic: "When I'm on service, I scrutinize the discharge summaries to make sure they remember to say put a stop date for the anticoagulation, for the DVT."



Participants appeared better informed about supporting transitions of care. The informational needs of patients and families were identified and ideas to address the current gaps were discussed, such as creating an information packet on what to expect following ICU discharge, and providing information to the primary care provider:

Peer Support: "...A letter to the General Practitioner (GP) explaining that the patient has had an ICU stay and that they may be experiencing some aspects of Post Intensive Care Syndrome (PICS)."

Participants felt that by gaining a better understanding of patient and family ICU experiences in post-ICU settings, they could more readily identify areas for improved care in the ICU:

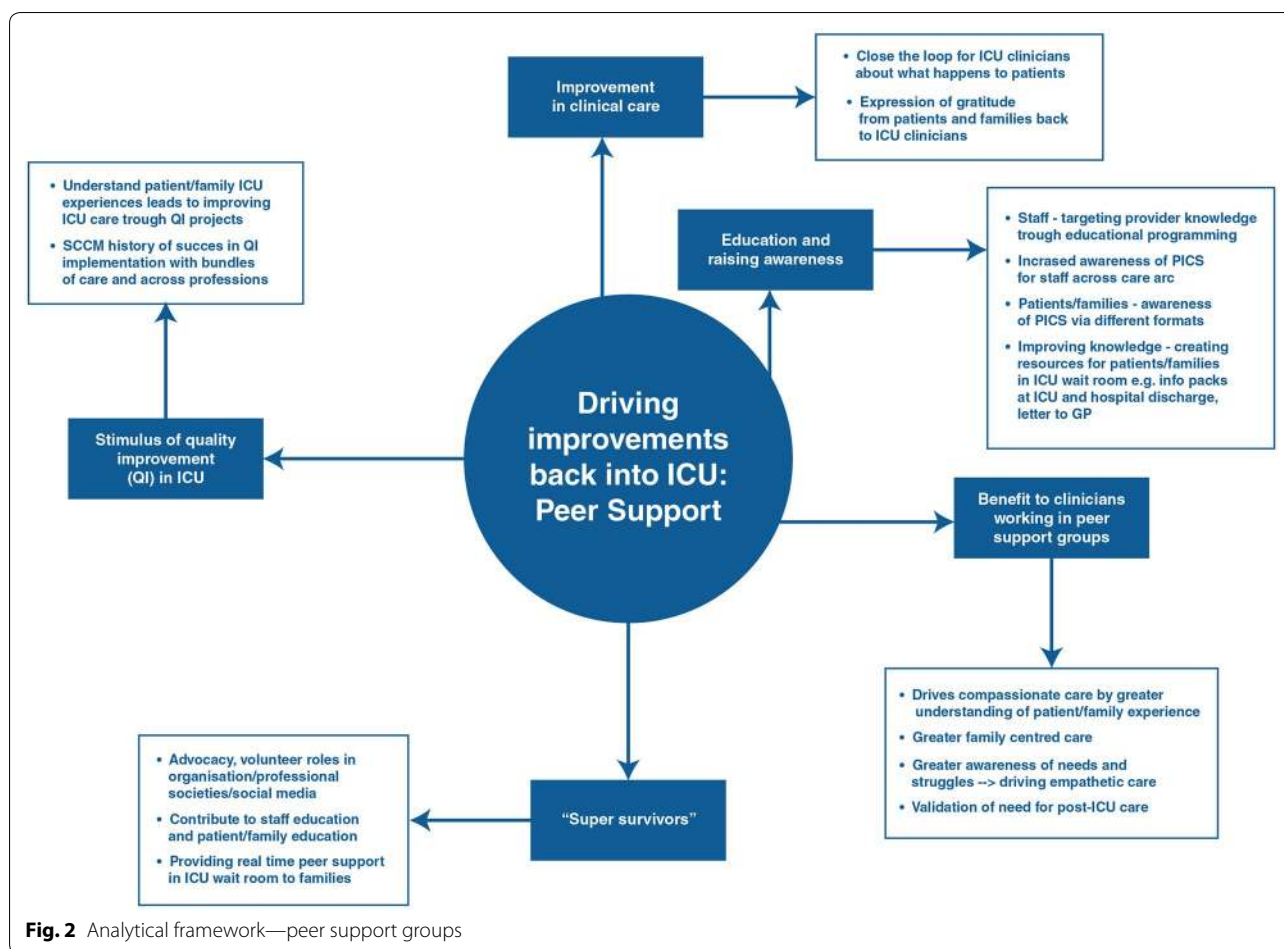
Peer Support: "...Little things like the 'all about me' boards. So I like to be called this, when I'm not in the intensive care unit I enjoy doing this, etc. I know a

lot of places had these already, we hadn't quite got to doing that till we got the feedback from patients and relatives."

2. Creating a new role for survivors in the ICU

Some former patients and families were able to take on a role of "super survivor," where they adopt an advocacy role in professional societies and social media to raise awareness. The benefits of this were reported to be twofold: survivors advocate not only for themselves and their fellow patients, but also created impetus for ICU follow-up programs. Former patients and families in a "super survivor" role also contributed to staff education:

Peer Support: "One patient and his wife came to the hospital grand round and talked about their experiences and there were 150 people in the audience, and it was quite amazing that they did that... it was good for them, they enjoyed the experience,



they felt like they were helping, and giving something back."

Other former patients and families went on to adopt a volunteer role in the ICU, within the organization that cared for them:

Peer Support: "We've had one or two people volunteering for shifts on the ICU, just answering the door, and showing people in, that kind of stuff."

Others provided real-time peer support in the ICU waiting room:

Peer Support: "we've heard from our support group, that they can come back to the ICU and be that inspiring person."

Peer volunteer roles appeared to harness the altruistic nature of survivors who expressed gratitude for surviving their critical illness and the wish to give something back to the health service. This mechanism of "super survivor" roles not only closed the knowledge gap for clinicians, about what happens to patients after ICU,

but provided reassurance and hope for patients and families.

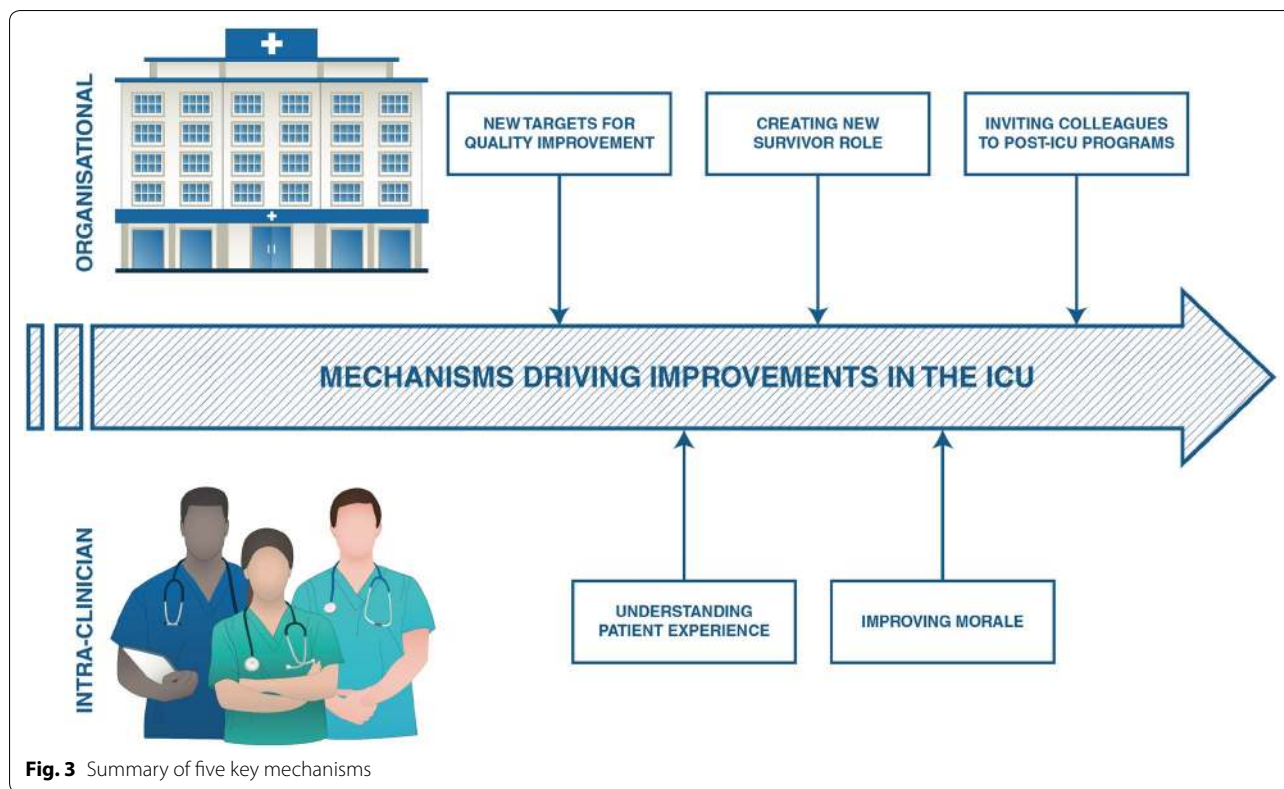
3. Educating ICU colleagues by having them visit the post-ICU program

Participants reported inviting peers to attend the post-ICU program to provide insights into how patients are cared for following ICU. This was reported to be a particularly helpful strategy for those sceptical about providing ICU follow-up services:

Clinic: "We've invited a lot of clinicians from the floor to see what we do and the things that we initiate through our own clinic... which is a great thing."

This knowledge was seen to inform clinical decision making in the ICU:

Clinic: "...Sometimes there's a push on palliative care, but sometimes you have a young otherwise healthy reversible disease and people are trying to push toward palliative care a little early... So



showing, I think from an education and trainee standpoint, that these folks actually do get out, maybe having them see some of the patients in the clinic too, but just at least giving the stories back to them is helpful.”

Working in clinics also changed inter-professional dynamic in the ICU, helping emphasize the expertise possessed by other clinicians:

Clinic: “Our pharmacist has said it’s been really helpful [working in clinic] because that affected his influence, his practice within the ICU and it’s the same for us...”

Informal/intra-clinician mechanisms to drive improvements back into the ICU

4. Changing clinician’s own understanding of patient experience

Participants also described a direct individual themselves. They reflected on becoming better clinicians by gaining greater insights into patient experience:

Clinic: “Seeing patients post-ICU has made me a better intensivist. It’s not just the training; it’s made me much more aware of things that I never gave thought to. Passing an NG tube and how excruciating that might be...”

Participants described a sense of fulfillment from working in clinics where they could deliver continuity of care, and partner with patients in helping them recover and improve their health:

Clinic: “The big plus for me has been watching people get better and watching them want to help.”

Participants described how they were being able to recognize, anticipate and pre-empt patient and family needs post-ICU, during the ICU admission:

Peer Support: “We can start the ball rolling before they actually leave intensive care. If we can predict that they’re going to be in for a while we get their benefits sorted.”

It appeared that participants were surprised that families held relatively low expectations, and by extending small gestures of acknowledgments and help, they could achieve a reasonable level of impact:

Clinic: "...It's clearly a service that's required because every patient that I speak to, or relative, goes; I'm so pleased you phoned. There's a sort of relief that someone is there to help them, because there is nothing and they're just popped out in the ocean to sink or swim."

5. Improving morale

Participants discussed that programs offered the opportunity to close the feedback loop to ICU staff, about positive outcomes of challenging cases mitigated the risk of burnout for some clinicians:

Clinic: "Staff morale's been boosted because of the feedback to nurses, a lot of nurses have responded saying.....hearing they're making progress has been really helpful."

They also described they were more empathetic when they practiced in the ICU, with a greater focus on family-centered care:

Peer Support: "And just appreciating that you hear about the struggles of maintaining home, life, work, and transportation and how if it's an hour and a half to get to the hospital, and the financial burden as well. It just meant that in my conversations with updating families I ask now a lot earlier how far have you got to travel, do you want accommodation at the hospital?"

By delivering post-ICU programs, participants felt validated that there was a need for some form of longitudinal care:

Peer Support: "People are saying things like thank god I found this site, I'm so glad to know I'm not the only one. A lot of people are saying that I'm not alone; I thought I was going crazy, I'm so glad I found this forum."

Discussion

Most evaluations of post-ICU care emphasize its patient and family-centered benefits, either via direct traditional patient care, or as a way to achieve closure for patients and families about unresolved questions from their illness. There has been much less focus on the ways in which such systems provide feedback to the health service and clinicians. We found five mechanisms by which post-ICU care is perceived by clinicians, to improve care within the ICU. Broadly, those mechanisms were: identifying new targets for quality improvement, creating new roles for survivors, educating ICU colleagues via visits to

post-ICU programs, understanding patient experience, and improving clinician morale. Overall, we found that post-ICU programs provide clinicians with a perspective that was not otherwise visible to teams when working only in the ICU.

Some of the practice changes that participants reported were transformational—for example, the integration of a new survivor volunteer role into the ICU and hospital setting. Yet many were incremental—elements that seem like common medical approaches. These elements had not been identified by the clinicians as part of their ongoing practice, but through interactions with patients after the ICU. This is consistent with literature in implementation science demonstrating ubiquitous challenges to implementing best practices [13]—including low tidal volume ventilation [14] and the administration of timely antibiotics [15]. The claim of this paper is not that engagement with post-ICU programs is necessary for these practice improvements to occur. Instead, post-ICU activities are an additional approach to drive practice improvements. In the view of study participants, engagement with post-ICU activities was an effective mechanism that drove improvements that may not have otherwise occurred. We did not find a consistent difference in our data between the mechanisms that came from clinician engagement with follow-up clinics as compared to peer support activities—the between institution variance was greater than the variance between these two types of activities, which frequently co-occur among these study participants. This suggests future research should not solely focus on specific post-ICU activities, but also develop feedback mechanisms for improving ongoing ICU care and measuring the impact of these activities on ICU care improvement.

A recurrent theme was that work in the post-ICU setting addressed contemporary workforce issues such as clinician burnout and compassion fatigue [16], both directly (for those staffing the clinic) and indirectly (by providing feedback to others). There is growing evidence supporting the link between clinician wellbeing and patient experience [17, 18] with recent data demonstrating that burnout is associated with lower quality care and patient satisfaction [19]. These concepts are congruent with Safety-I and Safety-II theories, where “safety management should move from ensuring that ‘as few things as possible go wrong’ to ensuring that ‘as many things as possible go right’ and where people in the system are viewed as an asset to achieve system flexibility and resilience” [20, 21]. Given the challenges of mitigating burnout, this benefit may be of value to some hospital systems.

Of interest, none of the participants had developed a separate reporting mechanism back to the ICU. Rather they integrated post-ICU experiences as another data

stream into existing (usually informal) ICU processes for uncovering opportunities for improvement. Systematic reporting mechanisms might offer yet further benefits and help understand the challenges of developing meaningful outcomes for patients. At present the literature in this field has focused on outcomes around health related quality of life and other individual level outcomes [22, 23]. This work should act as a catalyst for re-thinking outcomes; there may be other mechanisms by which ICU aftercare improves safety and effectiveness. However, this work examines clinician views in isolation; future work should explore this from a patient and caregiver perspective.

There are limitations to these data. The mechanisms perceived by clinicians have not been proven to be effective, nor directly measured, but should be. The post-ICU programs reported here were part of an international collaborative; programs run in isolation might have different effects. Although this unique international collaboration helped develop innovation generation in this area; it may be subject to bias as the participants are already motivated to conduct this work and improve care. We have used contemporary qualitative methods, including specific approaches to enhance reproducibility, such as a rigorous analytical process across an international team and extensive member-checking. Nonetheless, other interpretations may be possible.

Conclusions

While the evidence for post-ICU programs has not been established [6, 22], these data suggest an appropriate evaluation should include other benefits to such programs beyond the specific enrolled patients. We identified five key mechanisms by which post-ICU care is perceived by clinicians to drive improvements in care in the ICU: at a formal/organizational level and at an informal/intra-clinician level). Intentional effort to optimize these mechanisms may drive further improvements in patient and family-centered care in the ICU.

Electronic supplementary material

The online version of this article (<https://doi.org/10.1007/s00134-019-05647-5>) contains supplementary material, which is available to authorized users.

Author details

¹ Department of Physiotherapy, Western Health, Sunshine Hospital, Melbourne, Australia. ² Australian and New Zealand Intensive Care Research Centre, Monash University, Melbourne, Australia. ³ Division of Allergy, Pulmonary and Critical Care Medicine, Department of Medicine, Vanderbilt University Medical Center, Nashville, TN, USA. ⁴ Department of Physiotherapy, Western Health, Melbourne, VIC, Australia. ⁵ School of Nursing, Vanderbilt University, Nashville, TN, USA. ⁶ Critical Care Medicine, Springfield Clinic, Springfield, IL, USA. ⁷ Section of Pulmonary, Critical Care, Allergy and Immunology, Department of Internal Medicine, Wake Forest University School of Medicine, Winston Salem, NC, USA. ⁸ Department of Peri-operative Medicine, St Bartholomew's Hospital, Barts Health NHS Trust, London, UK. ⁹ Pulmonary Division, Department of Medicine, Intermountain Medical Center, Murray, UT, USA. ¹⁰ Center

for Humanizing Critical Care, Intermountain Health Care, Murray, UT, USA.

¹¹ Pulmonary Division, Department of Medicine, University of Utah, Salt Lake City, UT, USA. ¹² Department of Critical Care Medicine, University of Pittsburgh Medical Center, Pittsburgh, USA. ¹³ Tennessee Valley Healthcare System VA Medical Center, Nashville, TN, USA. ¹⁴ School of Nursing, University of California San Francisco, San Francisco, CA, USA. ¹⁵ Guy's and St Thomas' NHS Foundation Trust, London, UK. ¹⁶ Department of Pharmacy, Eskenazi Health, Indianapolis, IN, USA. ¹⁷ Division of Critical Care Medicine, Albert Einstein College of Medicine of Yeshiva University, New York, USA. ¹⁸ Pulmonary and Critical Care Medicine, Mayo Clinic, Rochester, MN, USA. ¹⁹ Department of Pharmacy, Wake Forest Baptist Medical Center, Winston Salem, NC, USA. ²⁰ Indiana University School of Medicine Research Scientist, Regenstrief Institute Inc., Indianapolis, IN, USA. ²¹ University Hospitals Cleveland Medical Center, Cleveland, OH, USA. ²² Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, Harborview Medical Center, University of Washington, Seattle, WA, USA. ²³ Department of Health and Human Services, Safer Care Victoria, Melbourne, Australia. ²⁴ Glasgow Royal Infirmary, NHS Greater Glasgow and Clyde, Glasgow, Scotland, UK. ²⁵ Division of Pulmonary, Critical Care and Sleep Medicine, University of Kentucky, Kentucky, USA. ²⁶ Division of Pulmonary, Critical Care and Sleep Medicine, Department of Medicine, National Jewish Health, Denver, CO, USA. ²⁷ Department of Pharmaceutical Services, Vanderbilt University Medical Center, Nashville, TN, USA. ²⁸ Division of Pulmonary and Critical Care, Department of Medicine, Brigham and Women's Hospital, Boston, MA, USA. ²⁹ Division of Pulmonary and Critical Care Medicine, University of Maryland School of Medicine, Maryland, USA. ³⁰ Department of Epidemiology and Public Health, University of Maryland School of Medicine, Maryland, USA. ³¹ Pulmonary and Critical Care Division, Department of Medicine, Intermountain Medical Center, Murray, UT, USA. ³² Psychology Department and Neuroscience Center, Brigham Young University, Provo, UT, USA. ³³ Division of Pulmonary, Allergy, and Critical Care Medicine, Hospital of the University of Pennsylvania, Philadelphia, USA. ³⁴ Division of Pulmonary and Critical Care, Department of Medicine, University of Michigan, Ann Arbor, MI, USA. ³⁵ Center for Clinical Management Research, VA Ann Arbor Healthcare System, Ann Arbor, MI, USA. ³⁶ School of Medicine, Dentistry and Nursing, University of Glasgow, Glasgow, Scotland, UK.

Acknowledgements

The authors would like to acknowledge and thank the following individuals who collectively contributed to the review of the original Grant application: Dr Daniela Lamas, Dr James C. Jackson, Ms Kate Cranwell, Dr Craig French, Dr Carol Hodgson.

Author contributions

Conception and design: KH, JM, TIJ, MM, CS. Data Collection: KH, JM, LB, CS. Primary analysis: KH, JM, EH, CS. Analysis and interpretation: JM, KH, CS, EH, TIJ. Drafting and revising the manuscript for important intellectual content: ALL.

Funding

K Haines, J McPeake, L Boehm, C Sevin and Tara Quasim are currently receiving funding from SCCM to undertake this work. L Boehm is funded by NIH/NHLBI (K12 HL137943) as is T J Iwashyna National Institutes of Health (US) (K12 HL138039).

Compliance with ethical standards

Conflicts of interest

No conflicts of interest declared by other authors.

Role of the funder

This analysis was funded by the Society of Critical Care Medicine (SCCM). The scientific questions, analytic framework, data collection, and analysis were undertaken independently of the funder. The Executive Council of SCCM reviewed the manuscript and offered input prior to finalization.

Open Access

This article is distributed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, distribution, and reproduction in any medium, provided you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license, and indicate if changes were made.

Publisher's Note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

Received: 17 January 2019 Accepted: 24 April 2019

Published online: 4 June 2019

References

- Lasiter S, Oles SK, Mundell J et al (2016) Critical care follow-up clinics: a scoping review of interventions and outcomes. *Clin Nurse Spec CNS* 30(4):227–237
- McPeake J, Hirshberg E, Christie L, Drumright K, Haines K, Hough T, Meyer J, Wade D, Andrews A, Bakhr RN, Bates S, Barwise J, Bastarache JA, Beesley SJ, Boehm LM, Brown S, Clay A, Firshman P, Greenberg SB, Harris W, Hill C, Hodgson C, Holdsworth C, Hope AA, Hopkins RO, Howell D, Janssen CJA, Jackson JC, Johnson A, Kross EK, Lamas D, MacLeod-Smith B, Mandel R, Marshall J, Mikkelsen ME, Nackino M, Quasim T, Sevin CM, Slack A, Spurr R, Still M, Thompson C, Weinhouse G, Wilcox ME, Iwashyna TJ (2019) Models of peer support to remediate post-intensive care syndrome: a report developed by the SCCM International Peer Support Collaborative (THRIVE). *Critical Care Med* 47(1):E21–E27
- Sevin CM, Bloom SL, Jackson JC et al (2018) Comprehensive care of ICU survivors: development and implementation of an ICU recovery center. *J Crit Care* 46:141–148
- Williams TA, Leslie GD (2008) Beyond the walls: a review of ICU clinics and their impact on patient outcomes after leaving hospital. *Aust Crit Care Off J Confed Aust Crit Care Nurses* 21(1):6–17
- McPeake J, Shaw M, Iwashyna TJ et al (2017) Intensive care syndrome: promoting independence and return to employment (InS:PIRE). Early evaluation of a complex intervention. *PLoS One* 12(11):e0188028
- Haines KJ, Beesley SJ, Hopkins RO, McPeake J, Quasim T, Ritchie K, Iwashyna TJ (2018) Peer support in critical care: a systematic review. *Crit Care Med* 46(9):1522–1531. <https://doi.org/10.1097/CCM.00000000000003293>
- Medicine SoCC (2017) THRIVE Peer Support Collaborative and Post ICU Clinic Collaborative. <http://www.sccm.org/Research/Quality/thrive/Pages/default.aspx>. Accessed 9 May 2018
- Angus DC, Carlet J (2003) Brussels Roundtable P. Surviving intensive care: a report from the 2002 Brussels Roundtable. *Intensive Care Med* 29(3):368–377
- Polkinghorne D (2005) Language and meaning: data collection in qualitative research. *J Couns Psychol* 52(2):137–145
- Hammarberg K, Kirkman M, de Lacey S (2016) Qualitative research methods: when to use them and how to judge them. *Hum Reprod* 31(3):498–501
- Gale NK, Heath G, Cameron E et al (2013) Using the framework method for the analysis of qualitative data in multi-disciplinary health research. *BMC Med Res Methodol* 13:117
- Tong A, Sainsbury P, Craig J (2007) Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care J Int Soc Qual Health Care/ISQua* 19(6):349–357
- McGlynn EA, Asch SM, Adams J et al (2003) The quality of healthcare delivered to adults in the United States. *N Engl J Med* 348(26):2635–2645
- Bellani G, Laffes JG, Pham T et al (2016) Epidemiology, patterns of care, and mortality for patients with acute respiratory distress syndrome in intensive care units in 50 countries. *JAMA* 315(8):788–800
- Seymour CW, Gesten F, Prescott HC et al (2017) Time to treatment and mortality during mandated emergency care for sepsis. *N Engl J Med* 376:2235–2244
- van Mol MM, Kompanje EJ, Benoit DD et al (2015) The prevalence of compassion fatigue and burnout among healthcare professionals in intensive care units: a systematic review. *PLoS One* 10(8):e0136955
- Maben J, Adams M, Peccei R et al (2012) 'Poppets and parcels': the links between staff experience of work and acutely ill older peoples' experience of hospital care. *Int J Older People Nurs* 7(2):83–94
- Robert G, Cornwell J, Locock L et al (2015) Patients and staff as codesigners of healthcare services. *BMJ* 350:g7714
- Panagioti M, Geraghty K, Johnson J (2018) Association between physician burnout and patient safety, professionalism, and patient satisfaction. *JAMA Intern Med* 178(10):1217–1330
- Braithwaite J, Wears RL, Hollnagel E (2015) Resilient health care: turning patient safety on its head. *Int J Qual Health Care J Int Soc Qual Health Care* 27(5):418–420
- Hollnagel E, Wears R, Braithwaite J (2015) From safety-I to safety-II: a white paper. US and Australia
- Schofield-Robinson OJ, Lewis SR, Smith AF et al (2018) Follow-up service for improving long-term outcomes in intensive care (ICU) survivors. *Cochrane Database Syst Rev* 11:1465–1858
- Walsh TS Salisbury, Merriweather LG, Boyd JL, Griffith JA, Huby DM, Kean G, Macenzie S, Krishan SJ, Lewis A, Murray SC, Forbes GD, Smith JF, Rattray J, Hull JE, Ramsay AM (2015) Increased hospital-based physical rehabilitation and information provision after intensive care unit discharge: the RECOVER randomized clinical trial. *JAMA Intern Med* 175(6):901–910