AUSTRALASIAN JOURNAL OF **PARAMEDICINE**

Review

How are ambulance personnel prepared and supported to withhold or terminate resuscitation and manage patient death in the field? A scoping review

Natalie Anderson MSc(Hons), RN is Professional Teaching Fellow, Doctoral Candidate¹ and Staff Nurse²; Julia Slark PhD, RN, is Senior Lecturer¹; Merryn Gott PhD, is Professor of Health Sciences¹

Affiliation:

¹Faculty of Medical & Health Sciences, The University of Auckland, New Zealand

²Adult Emergency Department, Auckland City Hospital, New Zealand

<https://doi.org/10.33151/ajp.16.697>

Abstract

Introduction

Research shows that ambulance personnel can find it challenging to withhold or terminate resuscitation and manage patient death in the field. This scoping review provides a synthesis of published research that has addressed three main questions. Each relates to ambulance personnel enacting decisions to withhold or terminate resuscitation and manage patient death: How are they prepare; what supports and coping strategies are utilised; and what preparation and support needs have been identified?

Methods

Using Arksey and O'Malley's five-stage scoping review framework this review identifies what is known and what further research is needed in this area.

Results

Sixteen methodologically heterogeneous papers were located. Half of the studies were conducted in the United States, with the remainder in Canada, Singapore, Spain, Sweden and the United Kingdom. Ambulance personnel receive little formal training and feel unprepared to manage situations where resuscitation is unsuccessful or unwarranted, particularly communicating with family, breaking bad news and managing death scenes. These aspects of termination of resuscitation are so challenging that distancing and avoidance are sometimes used as coping strategies, even when medical futility has been established. In addition to formal counselling for personal loss and stressors, ambulance personnel value downtime and informal peer debriefing, following difficult resuscitation decisions and patient deaths.

Conclusion

Ambulance personnel feel inadequately prepared to withhold or terminate resuscitation and manage patient death in the field. They want more opportunities to learn about death notification, communication with bereaved families and safe, sensitive management of death scenes. More research is needed to determine how best to prepare and support ambulance personnel for the challenges of resuscitation decision-making and patient death.

Keywords:

death; education; emergency medical services; out-of-hospital cardiac arrest; paramedics; resuscitation decisions

Corresponding Author: Natalie Anderson, na.anderson@auckland.ac.nz

The term 'ambulance personnel' is used throughout this review to describe clinical staff working in emergency ambulance response roles who are not doctors. It is acknowledged that nomenclature, scope and training of these providers differs internationally.

Introduction

Significant efforts have been made to improve rates of bystander cardiopulmonary resuscitation (CPR) (1), use of public access defibrillators (2) and optimise the overall effectiveness of out-of-hospital resuscitation efforts (3). However, survival rates from out-of-hospital cardiac arrest remain very low (4,5). Ultimately, resuscitation cannot reverse normal dying. With increasingly comorbid and aged communities, universal application of aggressive resuscitation efforts may not always be effective, warranted or what a patient wanted (6). Recognising this, an increasing number of countries authorise ambulance personnel to withhold or terminate resuscitation in accordance with clinical guidelines (7). There is, however, evidence of limited compliance where termination of resuscitation guidelines are in place (8,9).

Ambulance personnel experience high rates of post-traumatic stress and depression (10). Feeling prepared, having high self-efficacy and adequate organisational resources and support are associated with better workplace wellbeing and performance in ambulance personnel (11,12). With an international move away from vocational training of emergency ambulance personnel towards pre-employment degree preparation of paramedics, it is important to optimise preparation and support for demanding emergency ambulance roles and expanding scopes (13,14). Recently published research exploring ambulance personnel perspectives indicates that while providers retrospectively identify 'inappropriate' resuscitation attempts (15), making and enacting decisions to withhold or terminate resuscitation can be complex and challenging. In order to make such decisions, ambulance personnel need to elicit and integrate numerous patient, context, scene, personal and arrest-specific variables (16,17). Managing patient deaths in the community setting can be emotionally and ethically demanding (18,19) and managing the transition from active resuscitation to care of the bereaved and deceased requires significant skill and confidence (20).

This scoping review was undertaken to establish what is known about the preparation, support and coping of ambulance personnel who make and enact decisions to terminate or withhold resuscitation. Results provide a synthesis of research evidence describing and evaluating what has been done to prepare ambulance personnel to make and enact these difficult decisions, what existing supports and coping mechanisms have been identified and what more could be done.

Methods

Ambulance personnel roles and education have evolved significantly over the past few decades, but the evidence base specific to pre-hospital care by non-medical providers is limited. An initial literature search suggested the existing literature was limited, used a range of methods and involved demographically diverse samples of ambulance personnel working in varied contexts. This made it difficult to undertake a robust systematic review of evidence addressing the research questions. Instead, a scoping review was used to provide an overview, identify what is known and what further research might be needed (21). Formal ethical approval was not required for this scoping review. The PRISMA consensus guideline for conduct of scoping reviews was consulted by the authors (22) and the seminal five-stage framework outlined by Arksey and O'Malley (23) provided a clear structure for this review: 1) Identify research questions; 2) Identify relevant studies; 3) Select studies; 4) Chart data; and 5) Collate, summarise and report results.

Identify research questions

This review sought to identify what is known about the preparation and support of ambulance personnel making and enacting challenging resuscitation decisions to withhold or terminate resuscitation and manage patient death in the field. Research addressing the following questions was sought:

- How are ambulance personnel prepared to withhold or terminate resuscitation and manage patient death in the field?
- What supports and coping strategies are utilised by ambulance personnel withholding or terminating resuscitation and managing patient death in the field?
- What preparation and support needs have been identified for ambulance personnel withholding or terminating resuscitation and managing patient death in the field?

Identify relevant studies

Search terms were developed in consultation with a subject specialist librarian, and with consideration of the numerous terms used to describe non-medical emergency ambulance personnel (24).

In August 2018, the following databases were searched: Medline; Cumulative Index to Nursing and Allied Health Literature (CINAHL Plus); Science Direct and PsychInfo. The lead author also undertook manual searches of key articles' reference lists and cited reference searches through Scopus.

Inclusion criteria

Searches were limited to English-language publications from 2000 onwards, as out-of-hospital protocols for withholding and terminating resuscitation have largely been implemented this

century. Published papers and conference abstracts using any research methodology which addressed the three research questions were included.

Table 1. Key search terms

Ambulance personnel	ambulance*, paramedic*, emergency medical services, emergency medical technician, first responder
Challenging resuscitation decisions	resus*, heart arrest, cardiac arrest, death, terminal, palliat*, terminat*
Preparation and support	educat*, train*, teach*, support*, coping, emotion*, psycholog*, stress

Exclusion criteria

Non-empirical articles, including policy statements and opinion pieces, and foreign language papers with no translation were excluded. Papers which addressed end-of-life care or cardiac arrest, but did not address enactment of decisions to terminate or withhold resuscitation were excluded.

Select studies

Abstracts were screened for eligibility, with the majority of

articles rejected due to lack of subject relevance. Two authors (NA & JS) then independently screened full-text articles for eligibility. Where disagreement existed, the third author was consulted (MG). Three corresponding authors were contacted to enquire about participant scope of practice, definition of end-of-life emergencies and/or existence of any follow-up studies. Study selection is outlined in Figure 1.

Chart studies

Summary data from each study was extracted, including author, journal, publication year, sample, setting, research question and research design. Findings relevant to the preparation, support or coping and needs of ambulance personnel faced with challenging resuscitation decision-making were charted in corresponding columns. These charted summaries were imported into NVivo (25) to aid data management and coding. The authors used a combination of iterative coding, manual concept-mapping and critical discussion to create cohesive narrative synthesis of findings relevant to the three research questions. In accordance with scoping review guidelines (22,26) there was no formal appraisal of methodological quality or risk of bias and no study was excluded based on any assessment of quality.

Collate, summarise and report results

Studies included in this review are summarised in Table 2. A narrative synthesis of findings is presented under three headings, corresponding to the three research questions: 1) How are ambulance personnel prepared for challenging resuscitation decisions? 2) What supports and coping strategies are utilised by ambulance personnel making challenging resuscitation decisions? 3) What preparation and support needs have been identified for ambulance personnel making challenging resuscitation decisions?

Results

Through the described search and selection process, 16 papers derived from 14 studies were chosen for inclusion in this scoping review. All studies were undertaken with qualified, currently practising ambulance personnel. Studies included quantitative descriptive (27-31) and qualitative exploratory (32-36) research designs and evaluations of education interventions (37-40) and policy (41). The majority were undertaken in the United States (27-29,31,37-41) with others conducted in Canada (34,35,42), Sweden (36), United Kingdom (32), Spain (33) and Singapore (30).

How are ambulance personnel prepared to withhold or terminate resuscitation and manage patient death in the field?

When responding to a collapsed patient, it is expected that ambulance personnel will have been effectively prepared to rapidly identify a patient in cardiac arrest and initiate a skilled resuscitation effort which may involve numerous specialised skills. Preparation for this action has likely involved hours of classroom learning, familiarisation with algorithms, skill stations, clinical simulations and assessments. A vast and growing corpus of research has evaluated the efficacy of resuscitation teaching methods (43-45). By comparison, this review identified few research studies exploring or evaluating paramedic preparation to make and enact decisions to terminate or withhold resuscitation. Nine included studies reported inadequate training and/or a desire for more training in this area (27-30,32-34,36,39,41). Results from qualitative research by Bremer, Dahlberg and Sandman (36) Mainds and Jones (32) and Fernández-Aedo et al (33) all found ambulance personnel participants felt particularly concerned about the skills required to deliver death notification and communicate with family and bystanders. Tataris et al's (27) recent survey of over 2000 Chicago Emergency Medical Service providers showed that 36% of respondents had no training in performing death notification, and only 25% had received training through certification courses. Four papers (27,29,32,34) noted that learning about termination of resuscitation, death notification and communicating with families most commonly occurred on the job, including watching experienced ambulance personnel.

All included education intervention evaluation studies (37-40) described a single brief didactic death notification session,

with currently-practising ambulance personnel working in the US. Two studies also included a comparison group who attended additional or longer education interventions. In the study by Ponce et al (39) this subgroup was provided with a short opportunity to role play death notification. Smith-Cumberland (37) had one group attend a 16-hour intervention comprehensively examining pre-hospital patient death. Results suggest a short education intervention can increase knowledge and awareness (37,40) but opportunities for discussion and roleplay may be required to increase ambulance personnel self-efficacy and comfort with termination of resuscitation and communication of death notification (38,39).

What supports and coping strategies are utilised by ambulance personnel withholding or terminating resuscitation and managing patient death in the field?

Clinical practice guidelines are widely utilised as decision aids in ambulance personnel clinical decision-making. There is significant literature describing the development and validation of termination of resuscitation rules (46), but only one study identified by this review specifically sought to identify or evaluate the supports utilised by ambulance personnel managing termination of resuscitation and patient death. Grudzen et al (41) used mixed methods to evaluate a newly-implemented policy allowing ambulance personnel to withhold or terminate resuscitation in the field. Ambulance personnel perceived the policy as empowering and improving care, but many identified barriers to compliance with the policy. They also expressed concern that decisions to withhold or terminate resuscitation carried significant medicolegal risk.

Ambulance personnel are regularly exposed to uncertainty, distress and vicarious trauma. Participants in three exploratory studies valued downtime (brief stand-down from active work) and opportunities for peer debriefing after challenging resuscitation decision-making and patient deaths (33,35,36). Studies using a range of methodologies concluded that ambulance personnel reporting personal 'resolved' experiences with grief were more comfortable with termination of resuscitation and patient death. Patients with unresolved grief or other personal emotional stressors were likely to experience greater discomfort withholding or terminating resuscitation and managing patient death (30,36,46).

The behaviour of distressed family or bystanders at the scene of a cardiac arrest can be challenging and impact on ambulance personnel resuscitation decision-making (20). Seventy-one percent of emergency medical personnel surveyed by Ponce et al (39) described continuing futile CPR when family were present. Three studies in this review found that participants used distancing and detachment as coping mechanisms. Focus group participants in Mainds and Jones (32) study described both physical and emotional distancing in this situation, achieved by moving family members away from the collapsed patient and focussing on the technical aspects of resuscitation.

Table 2. Summary of included studies

Publication	Research question	Sample	Method	Key findings: preparation, support and coping
Bremer, Dahlberg, Sandman 2012 (36)	What are EMS personnel's experiences of caring for families when patients suffer cardiac arrest and sudden death?	10 EMS personnel southern Sweden	Qualitative exploratory design: interview study informed by hermeneutic lifeworld approach	The EMS personnel interviewed felt they needed to care for both patient and family. Patient care was well-structured but moving to family care required a context-specific, sensitive response. EMS personnel needed to balance between closeness and distance – facing the emotions of families while controlling their own emotional distress. EMS need training, clear guidelines, opportunities for reflection and emotional support
Douglas, Cheskes, Feldman, Rathapalan 2012 (35)	What are paramedics' experiences with death notification, and what supports exist?	28 paramedics Ontario, Canada	Qualitative exploratory design: inductive thematic analysis of four focus groups	Death notifications are stressful and dealing with death can be distressing. The four key themes were practical aspects; emotional toll acknowledgement; emotional toll management and support mechanisms. Switching from clinical to supportive focus during resuscitation is difficult. Afterwards, downtime, managerial and peer support was valued
Douglas, Cheskes, Feldman, Rathapalan 2013 (34)	What are paramedics' experiences with death notification education, and what format and context would they like, in this area?	28 paramedics Ontario, Canada	Qualitative exploratory design: inductive thematic analysis of four focus groups	Paramedics usually learn about death notification through trial and error and observation of others, but would prefer evidence-based teaching, including role play and feedback. Paramedics reported very little formal death notification education, but believed that they valued and applied whatever training they have had
Fernández-Aedo, Pérez-Urdiales, Unanue-Arza, García-Azpiaz, Ballesteros-Peña 2017 (33)	What are the experiences and coping skills of EMS staff after resuscitation efforts resulting in death?	13 EMS personnel Spain	Qualitative exploratory design: inductive analysis of six interviews and one focus group	Patient death can be distressing, particularly interacting with grieving family members. Participants did not feel prepared to break bad news to families. After patient deaths, EMS personnel sometimes discussed emotional responses with trusted colleagues, but identified few formal coping strategies
Grudzen, Timmermans, Koenig, et al 2009 (41)	What are paramedic and EMT perspectives after a policy change that allows forgoing or halting resuscitation in pre-hospital atrumatic cardiac arrest?	34 paramedics and two EMTs California, US	Mixed methods evaluation of policy change: five semi-structured focus group and a brief survey conducted 6 months after the introduction of new policy	Generally positive views reported, described termination or withholding of resuscitation in accordance with policy as 'a risk worth taking'. Importance of non-patient/non-clinical factors such as provider beliefs, emotional preparedness of family and arrest location appeared to impact on implementation of policy. Policy perceived as empowering and improved care, but still represented a risk to staff. Concerns expressed about situations where body was in a public place or family 'weren't emotionally prepared' to have a body left on scene
Hall, Myers, Pepe, Larkin, Sirbaugh, Persse 2004 (31)	What are paramedic perspectives on TOR for child patients compared with adult TOR?	201 paramedics from a single EMS provider Texas, US	Quantitative descriptive design: 26-item survey undertaken prior to development of a child TOR policy	Difficulties with adult TOR included: family confrontation (43%), personal discomfort (13%), disagreement with physician (11%), fear of liability (10%), comfort with concept of child TOR = 1 (on scale with 1 = very comfortable and 10 = uncomfortable) compared to comfort with adult TOR = 9
Hobgood, Mathew, Woodyard, Shofer, Brice 2013 (40)	Will the education intervention 'GRIEV_ING' improved confidence, competency and communication skills of EMS personnel?	29 EMS personnel North Carolina, US	Quantitative intervention evaluation: 90-minute education session. Pre-post measures included questionnaire and observation of simulated death notification	Post-intervention assessment showed statistically significant improvements in self-rated confidence and simulated-survivor-rated competency. Advocates for education interventions involving a structured approach to delivering effective death notification

Publication	Research question	Sample	Method	Key findings: preparation, support and coping
Mainds, Jones 2018 (32)	What are the non-clinical challenges associated with out-of-hospital cardiac arrest, including breaking bad news to family?	12 NHS ambulance service paramedics UK	Qualitative exploratory design: two focus groups each lasting 90 minutes Thematic framework analysis of transcripts	Paramedics didn't feel they have enough preparation for managing family present at cardiac arrest scenes and sometimes use distancing (separating family from resus) and distraction (giving family members jobs to do) to manage this. 'Warning shots' are used to prepare family for bad news. Paramedics didn't feel they have enough preparation for managing family at cardiac arrest scenes and learn to break bad news by watching experienced colleagues
Mao, Ong, Bang, et al 2017 (30)	What factors are associated with EMS psychological comfort with TOR?	254 EMS providers Singapore	Quantitative descriptive design: questionnaire utilising Personal Comfort with Termination scale to identify comfort with select aspects of TOR	Personal comfort with termination was positively associated with prior resolution of personal loss and knowledge of survival probability. Suggests that TOR training should move beyond didactic components and include evidence supporting TOR protocol, managing personal responses, bystanders and communication with bereaved
Morrison, Cheung, Redelmeier 2003 (42)	What factors are associated with EMS psychological comfort with field pronouncement of death?	120 paramedics, Ontario, Canada	Quantitative descriptive design and evaluation of survey instrument: questionnaire measuring personal comfort with field pronouncement	The survey was a valid and reliable instrument for measuring the paramedic psychological comfort with field pronouncement. Technical proficiency had a weak positive relationship with psychological comfort with field pronouncement, but years of overall and advanced paramedic experience did not. Adjustment to personal loss was significantly associated with psychological comfort with field pronouncement. Paramedics struggling with personal loss may benefit from extra support and may find managing patient death more difficult
Ponce, Swor, Quest, et al 2010 (39)	Is a 60-minute death notification intervention desired and feasible? Does it improve provider comfort with family witnessed resuscitation and death notification?	45 pre-hospital providers Michigan, US	Quantitative intervention evaluation: pilot study using convenience sample of providers attending education seminar. 45 attended 60-minute education session. Sub-group of 20 also attended a 45-minute TOR role play. Pre-post measures of attitudes and knowledge	Death notification training is desired and feasible. It may increase EMS comfort and skill with family witnessed resuscitation, TOR and death notification. Before the intervention, 71% of participants had continued resuscitation efforts despite futility, due to the presence of family. Providers were interested in improving their skills in death notification and facilitating family presence during resuscitation
Smith-Cumberland, Feldman 2005 (29)	What are EMTs attitudes towards their training, comfort and role when a patient dies on-scene?	136 EMTs 14 states, US	Quantitative descriptive design: Survey administered before completing a continuing education program. Likert scales and demographic variables	More than half of participants did not feel was training adequate to help families at time of death and three-quarters did not think training was adequate to make a death notification. Comfort was higher in more qualified and experienced participants
Smith-Cumberland, Feldman 2006 (38)	Are EMTs' attitudes toward death changed after exposure to a death education program?	83 rural EMTs Wisconsin, US	Quantitative intervention evaluation: quasi-experimental pre-post comparison with three conditions: short death education intervention (2 hour) long-intervention (16 hour) and control group (toxicology training). Measured attitude to death and death notification	Self-rated confidence increased in long-intervention group. Two-hour unit was enough to improve awareness and knowledge but not confidence or comfort in delivering death notification. The longer unit, which allowed for discussion and role-play, was able to improve comfort. Before intervention, most (>80%) EMTs described training to deliver death notifications and assist bereaved families as inadequate

Publication	Research question	Sample	Method	Key findings: preparation, support and coping
Smith-Cumberland 2006 (37)	Can a death education program change intended and reported behaviour at the scene of a death?	83 rural EMTs Wisconsin, US	Quantitative intervention evaluation: quasi-experimental pre-post comparison with three conditions: short death education intervention (2 hour) long-intervention (16 hour) and control group (toxicology training). Measured intended behaviour and 3 month follow-up of self-reported behaviour	The majority of EMTs who received the intervention and subsequently made a death notification reported changes in their behaviour, post-intervention. Death education interventions were correlated with changes in EMTs intended and reported behaviours in relation to death notification
Stone, Abbott, McClung, et al 2009 (28)	What are paramedics' attitudes towards end-of-life situations and how often do they encounter them? What preparation or training do paramedics' have, in the provision of end-of-life care?	236 paramedics Colorado and California, US	Quantitative descriptive design: Survey convenience sample from two US cities. Self-report measures of frequency encountered, importance and preparedness for end-of-life situations and tasks including understanding advanced directives, withholding or terminating resuscitation and supporting the bereaved	Surveyed paramedics self-reported that end-of-life related issues were of high importance and encountered regularly, but they had limited training in these areas. More end-of-life training for pre-hospital providers is needed and wanted. Particular areas of focus should include when to withhold treatments, how to verify and apply advance directives and how to discuss death with bereaved family and friends
Tataris, Richards, Stein-Spencer, et al 2017 (27)	What are EMS providers' perceived barriers to performing TOR and how could protocols and education be improved?	2309 EMS providers Chicago, US	Quantitative descriptive design: custom survey instrument	What training to perform death notification? 37% on the job, 25% certification courses, 22% continuing education, 13% initial workplace orientation, 14% self-study/other, 36% nil training – do not know how. Identified barriers to TOR: scene safety threats (chiefly secondary to family response to TOR) and a lack of confidence, comfort and training in death notification delivery and dealing with distressed bystanders and family
Abbreviations EMS: Emergency medical services EMT: Emergency medical technician TOR: Termination of resuscitation				

In their exploratory interview study, Bremer, Dahlberg (36) also noted that ambulance personnel initially approach cardiac arrest and sudden death scenes with a focus on the rational, structured behaviours of resuscitation or diagnosing death. Although this may be a response to overwhelming cognitive demands, it was also used to avoid interaction or empathetic engagement with family and bystanders.

What preparation and support needs have been identified for ambulance personnel enacting decisions to withhold or terminate resuscitation and manage patient death?

A number of included studies explicitly described or measured preparation and support needs in this area, and these are summarised in Table 3.

Table 3. Identified preparation and support needs for ambulance personnel withholding or terminating resuscitation and managing patient death

Identified preparation needs
Improved knowledge and understanding of: <ul style="list-style-type: none"> Termination of resuscitation guideline derivation, prognostic indicators and survival statistics (30,42) Local medicolegal issues including documented patient wishes (28,31)
Improved self-confidence through rehearsal/role-play and discussion of: <ul style="list-style-type: none"> Managing death scenes and bystanders (27-30,32-34,36,39,41) Death notification delivery and communication with bereaved family (27-30,33,36,38,39)
Identified support needs
Access to: <ul style="list-style-type: none"> Clear policies or guidelines (36,41) Informal peer support and opportunities to discuss difficult decisions (33,35,36) Professional support for occupational or personal stressors (30,42)

Discussion

The decision to withhold or terminate resuscitation is not easy for ambulance personnel to make or enact, as they must then transition their care to manage the scene of a patient death (20,47). This scoping review is the first to provide a synthesis of research describing and evaluating the way that ambulance personnel are prepared for, supported through and cope with the associated challenges. Findings suggest that ambulance personnel feel insufficiently-prepared for death notification delivery and communicating with distressed family and bystanders. For over 25 years researchers have been calling for more education to better prepare ambulance staff for patient death scenes (48). Education interventions for death notification included in this review provided a structured approach to breaking bad news. These recipe-style guides did not appear to acknowledge the unique contextual demands

of the community setting. Ambulance personnel are usually delivering this information to people they have only just met. Death may be sudden and unexpected and the cause unclear. The scene may be uncontrolled and lack privacy, and there may be difficulty ascertaining family relationships and accessing support services (49,50). While building on the existing interdisciplinary evidence base is important, research specific to the out-of-hospital emergency context is needed. This review revealed a lack of evaluation of user-satisfaction with clinical guidelines and other resuscitation decision-supports. With the exception of work by Grudzen et al (41) there is no evidence supporting the user-utility of documented rules or guidelines for withholding or terminating resuscitation. While there is a strong evidence base validating out-of-hospital termination of resuscitation protocols (7,46,51) there is also evidence of variation between clinical practice and these protocols (8,52). Future researchers should consider seeking a provider-perspective on the best way to provide information or other supports for clinical decision-making in the field.

Clinical exposure to death and dying is an inevitable part of many healthcare roles, and confidence and comfort managing these situations appears to increase with personal and occupational exposure (53). Patient death, uncertainty, managing distressed family members and witnessing acute grief reactions have all been identified as potential workplace stressors for ambulance personnel (54,55). The strategies identified in this review, including downtime (56), peer support (12,55) and the use of emotional detachment (57,58) have all previously been identified as key coping mechanisms for emergency personnel managing critical incidents. Without adequate preparation and support, it appears some ambulance personnel distance themselves from decision-making and commence or continue resuscitation in order to avoid managing a patient death and engaging with the grief of bereaved family members. Feeling unprepared and unsupported has been associated with heightened death anxiety, avoidance and distress in ambulance personnel and other health professionals (59-62). More research is needed to identify the specific impact of resuscitation decision-making and patient death and what can be done to improve preparation and support.

Strengths and limitations

This scoping review offers an inclusive approach to knowledge synthesis in the developing area of ambulance personnel education. It provides an overview of the existing evidence base and identifies gaps in the published research literature. The authors used an established scoping review framework (23) and consulted the latest consensus guidelines for scoping review reporting (22). Formal quality appraisal for included studies was limited to each publication's peer review process (26).

There is significant heterogeneity in study samples within this review, including variation in provider scope, cultural and medico-legal context, education models and provider demographics. Of particular note, North American study

samples were made up of 80 to 100% male participants, while the studies from Singapore, Sweden and the UK approximated equal proportions of male and female participants. While these samples may reflect their underlying ambulance personnel demographic make up, this was rarely flagged in study findings. Generalisation across such diverse groups must be made cautiously, with evidence that individual factors such as gender, age and culture impact on ambulance personnel coping and support needs (10,30).

Implications and recommendations

This scoping review has revealed relatively little published research exists to specifically guide education policy or supportive practice in this area. Other disciplines including medicine and nursing, have a diverse and building evidence base outlining optimal clinician preparation and support for resuscitation decision-making, communication with bereaved relatives and coping with patient death (63,64-68). While this research offers some useful insights, resuscitation decisions in the community setting have unique contextual features, and the needs of ambulance personnel may differ.

Historically, confidence in withholding and terminating resuscitation and managing patient death may have developed in vocational training through mentoring and clinical exposure. However, with an international move to pre-employment degree-level paramedic training, it is important to understand the quality and quantity of clinical exposure, learning, comfort and concerns of graduate paramedicine students and how best to prepare and support them. It is likely that unpublished and informal training initiatives and organisational supports are in place. Where feasible, a review of curricula could provide useful additional information. Evaluation and publication of education and support interventions will facilitate the advancement of ambulance personnel-specific evidence and pedagogical theory in this area.

Conclusion

This scoping review highlights a paucity of research exploring the preparation and support of ambulance personnel for making and enacting decisions to withhold or terminate resuscitation and manage patient death in the field. Ambulance personnel need more training to feel confident providing death notifications and communicating with families and bystanders present at the scene of a patient death. Future research designs should acknowledge the unique demands faced by ambulance personnel tasked with making and enacting challenging resuscitation decisions and managing patient death.

Conflict of interest

The author of this paper reports no competing interests and has completed the ICMJE conflict of interest statement.

References

1. Wissenberg M, Lippert FK, Folke F, et al. Association of national initiatives to improve cardiac arrest management with rates of bystander intervention and patient survival after out-of-hospital cardiac arrest. *JAMA* 2013;310:1377-84.
2. Baekgaard JS, Viereck S, Moller TP, et al. The effects of public access defibrillation on survival after out-of-hospital cardiac arrest: a systematic review of observational studies. *Circulation* 2017;136:954-65.
3. Hollenberg J, Svensson L, Rosenqvist M. Out-of-hospital cardiac arrest: 10 years of progress in research and treatment. *J Intern Med* 2013;273:572-83.
4. Eid SM, Abougergi MS, Albaeni A, Chandra-Strobos N. Survival, expenditure and disposition in patients following out-of-hospital cardiac arrest: 1995–2013. *Resuscitation* 2017;113:13-20.
5. Gräsner J-T, Lefering R, Koster RW, et al. EuReCa ONE - 27 Nations, ONE Europe, ONE Registry: a prospective one month analysis of out-of-hospital cardiac arrest outcomes in 27 countries in Europe. *ibid.* 2016;105:188-95.
6. Pitcher D, Fritz Z, Wang M, Spiller JA. Emergency care and resuscitation plans. *BMJ* 2017;356.
7. Cone D. Developing the science of out-of-hospital termination of resuscitation. *Resuscitation* 2014;85:446-7.
8. O'Brien E, Hendricks D, Cone DC. Field termination of resuscitation: analysis of a newly implemented protocol. *Prehosp Emerg Care* 2008;12:57-61.
9. Brywczyński J, McKinney J, Pepe PE, et al. Emergency medical services transport decisions in posttraumatic circulatory arrest: are national practices congruent? *J Trauma* 2010;69:1154-9.
10. Donnelly E, Siebert D. Occupational risk factors in the emergency medical services. *Prehosp Disaster Med* 2012;24:422-9.
11. Regehr C, Millar D. Situation critical: high demand, low control, and low support in paramedic organizations. *Traumatology* 2007;13:49-58.
12. Gouweloos-Trines J, Tyler MP, Giummarra MJ, et al. Perceived support at work after critical incidents and its relation to psychological distress: a survey among prehospital providers. *Emerg Med J* 2017;34:816-22.
13. Bigham BL, Kennedy SM, Drennan I, Morrison LJ. Expanding paramedic scope of practice in the community: a systematic review of the literature. *Prehosp Emerg Care* 2013;17:361-72.
14. Cooper SJR, Grant J. New and emerging roles in out of hospital emergency care: a review of the international literature. *Int Emerg Nurs* 2009;17:90-8.
15. Druwe P, Monsieurs KG, Piers R, et al. Perception of inappropriate cardiopulmonary resuscitation by clinicians working in emergency departments and ambulance cross sectional survey. *Resuscitation* 2018;132:112-9.
16. Anderson NE, Gott M, Slark J. Beyond prognostication:

References (continued)

- ambulance personnel's lived experiences of cardiac arrest decision-making. *Emerg Med J* 2018;35:208-13.
17. Brandling J, Kirby K, Black S, Voss S, Bengner J. Emergency medical service provider decision-making in out of hospital cardiac arrest: an exploratory study. *BMC Emerg Med* 2017;17:24.
18. Karlsson M, Karlsson N, Hilli Y. Ethical dilemmas during cardiac arrest incidents in the patient's home. *Nurs Ethics* 2019;26:625-37.
19. Ågård A, Herlitz J, Castren M, Jonsson L, Sandman L. Guidance for ambulance personnel on decisions and situations related to out-of-hospital CPR. *Resuscitation* 2012;83:27-31.
20. Anderson NE, Gott M, Slark J. Grey areas: New Zealand ambulance personnel's experiences of challenging resuscitation decision-making. *Int Emerg Nurs* 2018;39:62-7.
21. Munn Z, Peters MDJ, Stern C, et al. Systematic review or scoping review? Guidance for authors when choosing between a systematic or scoping review approach. *BMC Med Res Methodol* 2018;18:143.
22. Tricco AC, Lillie E, Zarin W, et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med* 2018;169:467-73.
23. Arksey H, O'Malley L. Scoping studies: towards a methodological framework. *Int J Soc Res Methodol* 2005;8:19-32.
24. Olaussen A, Semple W, Oteir A, Todd P, Williams B. Paramedic literature search filters: optimised for clinicians and academics. *BMC Med Inform Decis Mak* 2017;17:146.
25. QSR International Pty Ltd. NVivo Qualitative Data Analysis Software. 11 edn, 2012.
26. Khalil H, Peters M, Godfrey CM, et al. An evidence-based approach to scoping reviews. *Worldviews Evid Based Nurs* 2016;13:118-23.
27. Tataris KL, Richards CT, Stein-Spencer L, et al. EMS provider perceptions on termination of resuscitation in a large, urban EMS system. *Prehosp Emerg Care* 2017;21:610-5.
28. Stone SC, Abbott J, McClung CD, et al. Paramedic knowledge, attitudes and training in end-of-life care. *Prehosp Disaster Med* 2009;24:529-34.
29. Smith-Cumberland TL, Feldman RH. Survey of EMTs' attitudes towards death. *Prehosp Disaster Med* 2005;20:184-8.
30. Mao DRH, Ong MEH, Bang C, et al. Psychological comfort of paramedics with field death pronouncement: a national asian study to prepare paramedics for field termination of resuscitation. *Prehosp Emerg Care* 2017:1-5.
31. Hall WL, Myers JH, Pepe PE, et al. The perspective of paramedics about on-scene termination of resuscitation efforts for pediatric patients. *Resuscitation* 2004;60:175-87.
32. Mainds MD, Jones C. Breaking bad news and managing family during an out-of-hospital cardiac arrest. *Journal of Paramedic Practice* 2018;10:292-9.
33. Fernández-Aedo I, Pérez-Urdiales I, Unanue-Arza S, García-Azpiazu Z, Ballesteros-Peña S. A qualitative study about experiences and emotions of emergency medical technicians and out-of-hospital emergency nurses after performing cardiopulmonary resuscitation resulting in death. *Enferm Intensiva* 2017;28:57-63.
34. Douglas L, Cheskes S, Feldman M, Ratnapalan S. Death notification education for paramedics: past, present and future directions. *Journal of Paramedic Practice* 2013;5:152-9.
35. Douglas L, Cheskes S, Feldman M, Ratnapalan S. Paramedics' experiences with death notification: a qualitative study. *ibid.* 2012;4:533-9.
36. Bremer A, Dahlberg K, Sandman L. Balancing between closeness and distance: emergency medical services personnel's experiences of caring for families at out-of-hospital cardiac arrest and sudden death. *Prehosp Disaster Med* 2012;27:42-52.
37. Smith-Cumberland TL. The evaluation of two death education programs for EMTs using the theory of planned behavior. *Death Stud* 2006;30:637-47.
38. Smith-Cumberland TL, Feldman RH. EMTs' attitudes' toward death before and after a death education program. *Prehosp Emerg Care* 2006;10:89-95.
39. Ponce A, Swor R, Quest TE, et al. Death notification training for prehospital providers: a pilot study. *ibid.* 2010;14:537-42.
40. Hobgood C, Mathew D, Woodyard DJ, Shofer FS, Brice JH. Death in the field: teaching paramedics to deliver effective death notifications using the educational intervention "GRIEV_ING". *ibid.* 2013;17:501-10.
41. Grudzen CR, Timmermans S, Koenig WJ, et al. Paramedic and emergency medical technicians views on opportunities and challenges when forgoing and halting resuscitation in the field. *Acad Emerg Med* 2009;16:532-8.
42. Morrison LJ, Cheung MC, Redelmeier DA. Evaluating paramedic comfort with field pronouncement: development and validation of an outcome measure. *ibid.* 2003;10:633-7.
43. Greif R, Lockey AS, Conaghan P, et al. European Resuscitation Council Guidelines for Resuscitation 2015: Section 10. Education and implementation of resuscitation. *Resuscitation* 2015;95:288-301.
44. Dyson K, Bray JE, Smith K, et al. Paramedic resuscitation competency: a survey of Australian and New Zealand emergency medical services. *Emerg Med Australas* 2017;29:217-22.
45. Mundell WC, Kennedy CC, Szostek JH, Cook DA. Simulation technology for resuscitation training: a systematic review and meta-analysis. *Resuscitation* 2013;84:1174-83.
46. Morrison LJ, Verbeek PR, Zhan C, Kiss A, Allan KS. Validation of a universal prehospital termination of resuscitation clinical prediction rule for advanced and basic life support providers. *ibid.* 2009;80:324-8.

References (continued)

47. Becker TK, Gausche-Hill M, Aswegan AL, et al. Ethical challenges in emergency medical services: controversies and recommendations. *Prehosp Disaster Med* 2013;28:488-97.
48. Norton RL, Bartkus EA, Schmidt TA, et al. Survey of emergency medical technicians' ability to cope with the deaths of patients during prehospital care. *ibid.* 1992;7:235-42.
49. Loscar TA. The policy of truth. Death notifications are part of our jobs, but we're rarely trained in delivering them. *EMS Mag* 2010;39:38-44.
50. Walker E. Death notification delivery and training methods. *Journal of Paramedic Practice* 2018;10:334-41.
51. Chiang W-C, Ko PC-I, Chang AM, et al. Predictive performance of universal termination of resuscitation rules in an Asian community: are they accurate enough? *Emerg Med J* 2015;32:318-23.
52. Verhaert DVM, Bonnes JL, Nas J, et al. Termination of resuscitation in the prehospital setting: a comparison of decisions in clinical practice vs. recommendations of a termination rule. *Resuscitation* 2016;100:60-5.
53. Anderson WG, Williams JE, Bost JE, Barnard D. Exposure to death is associated with positive attitudes and higher knowledge about end-of-life care in graduating medical students. *J Palliat Med* 2008;11:1227-33.
54. Halpern J, Maunder RG, Schwartz B, Gurevich M. The critical incident inventory: characteristics of incidents which affect emergency medical technicians and paramedics. *BMC Emerg Med* 2012;12:10.
55. Bohström D, Carlström E, Sjöström N. Managing stress in prehospital care: Strategies used by ambulance nurses. *Int Emerg Nurs* 2017;32:28-33.
56. Halpern J, Maunder RG, Schwartz B, Gurevich M. Downtime after critical incidents in emergency medical technicians/paramedics. *Biomed Res Int* 2014;2014:483140.
57. Avraham N, Goldblatt H, Yafe E. Paramedics' experiences and coping strategies when encountering critical incidents. *Qual Health Res* 2014;24:194-208.
58. Williams A. A study of emotion work in student paramedic practice. *Nurse Educ Today* 2013;33:512-7.
59. Anderson NE, Kent B, Owens RG. Experiencing patient death in clinical practice: nurses' recollections of their earliest memorable patient death. *Int J Nurs Stud* 2015;52:695-704.
60. Brady M. Death anxiety among emergency care workers. *Emerg Nurse* 2015;23:32-7.
61. Brady M. Mortality face to face: death anxiety in paramedics. *Journal of Paramedic Practice* 2013;5:130-3.
62. McClatchey IS, King S. The impact of death education on fear of death and death anxiety among human services students. *Omega (Westport)* 2015;71:343-61.
63. Ho Chan WC, Tin AF. Beyond knowledge and skills: self-competence in working with death, dying, and bereavement. *Death Stud* 2012;36:899-913.
64. Draper EJ, Hillen MA, Moors M, et al. Relationship between physicians' death anxiety and medical communication and decision-making: a systematic review. *Patient Educ Couns* 2019;102:266-74.
65. Zheng R, Lee SF, Bloomer MJ. How new graduate nurses experience patient death: A systematic review and qualitative meta-synthesis. *Int J Nurs Stud* 2016;53:320-30.
66. Fraser K, Huffman J, Ma I, et al. The emotional and cognitive impact of unexpected simulated patient death: a randomized controlled trial. *Chest* 2014;145:958-63.
67. Consales G, Zamidei L, Michelagnoli G. Education and training for moral and ethical decision-making at the end of life in critical care. *Trends in Anaesthesia and Critical Care* 2014;4:178-81.
68. Taylor D, Luterma A, Richards WO, Gonzalez RP, Rodning CB. Application of the core competencies after unexpected patient death: consolation of the grieving. *J Surg Educ* 2013;70:37-47.