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**Healthcare professionals' values about and experience with facilitating end-of-life care in
the adult intensive care unit.**

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ABSTRACT

Objectives: To evaluate values and experience with facilitating end-of-life care among intensive care professionals (registered nurses, medical practitioners, and social workers) to determine perceived education and support needs.

Research Design: Using a cross-sectional study design, 96 professionals completed a survey on knowledge, preparedness, patient and family preferences, organisational culture, resources, palliative values, emotional support, and care planning in providing end-of-life care.

Setting: General adult intensive care unit at a tertiary *referral* hospital.

Results: Compared to registered nurses, medical practitioners reported lower emotional and instrumental support after a death, including colleagues asking if OK ($p=0.02$), lower availability of counselling services ($p=0.01$), perceived insufficient time to spend with families ($p=0.01$), less in-service education for end-of-life topics ($p=0.002$) and symptom management ($p=0.02$).

Registered nurses reported lower scores related to knowing what to say to the family in end-of-life care scenarios ($p=0.01$).

Conclusion: Findings inform strategies for practice development to prepare and support healthcare professionals to provide end-of-life care in the intensive care setting. Professionals reporting similar palliative care values and inclusion of patient and family preferences in care planning is an important foundation for planning interprofessional education and support with opportunities for professionals to share experiences and strengths.

IMPLICATIONS FOR CLINICAL PRACTICE

- Decisions regarding end-of-life care (EOLC) in the intensive care can be complex and challenging for healthcare professionals involved.
- Support strategies are needed to support healthcare professionals providing EOLC. Such strategies may include greater peer-to-peer emotional support, in-service education in topics such as communication techniques, and changes in workloads to allow professionals enough time to spend with the family.
- Interprofessional approach to ongoing supports and education may be beneficial so healthcare professionals can learn from each other's strengths and experiences and may also help promote a supportive climate among intensive care professionals when delivering end-of-life care.

KEYWORDS

Bereavement, Critical Care, End of Life, Intensive Care Units, Needs Assessment, Nurses, Palliative Care, Physicians, Terminal Care

INTRODUCTION

Intensive care is predominately used for people with a reversible critical illness where the treatment goal is to return them to their acceptable level of quality of life (Australian and New Zealand Intensive Care Society, 2014). In situations where this goal is unable to be met, life-sustaining treatment is ceased, and the focus of care is changed to providing dignity, comfort, and limiting distress during the dying process (Australian and New Zealand Intensive Care Society, 2014).

Providing end-of-life care is routine intensive care management with mortality rates for adult intensive care units reported around 5.6-19.1% (Australian and New Zealand Intensive Care Society, 2018, Capuzzo et al. , 2014, Lilly et al. , 2017). Despite end-of-life care being common management, the decision to change the primary focus of care for the intensive care unit (ICU) patient from delivering lifesaving treatment to promoting dignity and comfort during the dying process can be complex and contain some levels of uncertainty for ICU health professionals with prior research reporting potential personal feelings of distress delivering the care, struggles with prognostication, conflicts between family or interprofessional teams, role dissatisfaction, and being emotionally burdened with providing the care (Donnelly and Psirides, 2015, Pattison et al. , 2020, Taylor et al. , 2020). Healthcare professionals' experience with providing end-of-life care is a dynamic process that is influenced by their learned behaviour in approaching and implementing end-of-life care, the emotions associated with the behaviour, and deliberations required to make choices in times of conflict between behaviour and emotion (Farjoun et al. , 2015). This triad may be influenced by an individuals' values and the workplace organisational culture (Farjoun, Ansell, 2015).

Healthcare professionals who have received education on end-of-life care topics are reportedly better able to cope with a patient's death and are consequently reported to be able to provide higher quality end-of-life care (Zheng et al. , 2018), but healthcare professionals commonly report gaps in their knowledge, skills, and the supports received to implement this type of ICU care (Brooks et al. , 2017, Carvajal et al. , 2019, Ganz, 2019, Ranse et al. , 2020).

Despite evidence that providing end-of-life care can take a toll on bedside professionals, limited empirical evidence is available on healthcare professionals' values and experiences with end-of-life care (EOLC) (Efstathiou et al. , 2019), and the majority of available evidence is based on qualitative studies (Pattison N and Campbell, 2016). Having a greater understanding of the healthcare professionals' values and experiences with end-of-life care using a quantitative approach will inform future multidisciplinary emotional and instrumental support strategies, including targeted education programs to facilitate best practices in end-of-life scenarios.

The aim of this study was to evaluate values about and experiences with facilitating end-of-life care among nursing, medical, and social work professionals to determine the perceived supports and educational needs of healthcare professionals in providing EOLC. Specifically, this study evaluates health professionals: knowledge, preparedness, patient and family preferences, organisational culture, resources, palliative values, emotional support, and care planning. This study is the first of our knowledge to explore, through survey, provisions of end-of-life care for ICU healthcare professionals.

MATERIALS AND METHODS

Study design

A survey was administered both by paper and online using REDCap electronic data capture tools hosted at the University of Sydney (Harris et al. , 2019) to achieve the objectives of the study.

Study site

This study was conducted at a combined 13-bed general adult ICU, 4-bed high dependency unit at a tertiary referral centre in Sydney, Australia. This hospital does not have a separate palliative care ward, so end-of-life care during a person's terminal phase of life is conducted within the ICU, or at times, a patient may be transferred to an appropriate ward for more long-term nursing care. Ethics and site approval were obtained from the South Eastern Sydney Local Health District Human Research Ethics Committee (HREC Ref 17/152).

Sampling and recruitment

All registered nurses (RNs), medical practitioners, and social workers (SWs) employed full time, part time, or regular casual staff who had worked more than three months in this ICU and had experience in implementing end-of-life and bereavement care were invited by the researchers through flyers placed in staff common areas, employee email, and the unit's private social media page to participate between June and August 2017. Staff self-determined participation eligibility prior to participation, and consent was implied for all returned anonymous surveys.

Physicians Assistants, Nurse Practitioners, Respiratory Therapists, and dedicated ICU Chaplains are not employed in this ICU.

Instrument

The survey was adapted from a previous national cross-sectional survey developed by Ranse et al. (2015) that explored factors influencing the provision of end-of-life care in registered nurses in critical care settings (Ranse K et al. , 2015). Adaptations included omitting the phrase “nurse” or replacing it with an inclusive term such as “healthcare staff” so as to be applicable to non-nurse participants. Unlike prior surveys on the quality of the dying process (Levy CR et al. , 2005) or professionals’ experience providing end-of-life care (Boissier et al. , 2020), the survey by Ranse et al. (2015) was designed to assist with strategies for practice development to prepare and support RNs with EOLC in the intensive care setting. The survey consists of 38 items measured across eight concepts related to provisions of end-of-life care: knowledge (four items), preparedness (three items), patient and family preferences (six items), organisational culture (three items), resources (five items), palliative values (five items), emotional support (six items), and care planning (six items) (Ranse K, Yates P, 2015). These concepts are organised based on the Promoting Action on Research Implementation in Health Services (PARiHS) framework’s elements of *evidence*, *context*, and *facilitation* (Ranse K, Yates P, 2015). *Evidence* relates to all forms of credible knowledge from a range of sources informing clinical practice. *Context* pertains to the environment where the health practice occurs. *Facilitation* is the process of help and support needed to make things easier for others; see Table 1 (Ranse K, Yates P, 2015, Rycroft-Malone, 2004).

[Table 1 near here].

Levels of agreement for individual items were measured on a 6-point Likert scale where: 1= completely disagree; 2= mostly disagree; 3= slightly disagree; 4= slightly agree; 5= mostly agree; 6= completely agree with potential ranges for knowledge (4-24), preparedness (3-18), patient and family preferences (6-36), organisational culture (3-18), resources (5-30), palliative values (5-30), emotional support (6-36), and care planning (6-36). In the intensive care setting where death can occur shortly after withdrawal of life-sustaining treatment during a person's terminal phase of life, locally, the term 'palliative' is commonly used interchangeably with end-of-life care. For this survey, the palliative values section encompassed end-of-life care concepts.

Internal reliability for the original Ranse et al. (2015) scale has been previously reported with Cronbach's alphas ranging from 0.69-0.85 (Ranse K, Yates P, 2015). In the study reported here, Cronbach's alpha for the adapted scales were calculated as: knowledge (0.79), preparedness (0.67), patient and family preferences (0.73), organisational culture (0.53), resources (0.78), palliative values (0.69), emotional support (0.82), and care planning (0.78).

Statistical analysis was conducted using SPSS version 24 (IBM Corp, Released 2016) and descriptive statistics reported as mean (standard deviation [SD]). There were 128 eligible healthcare professionals working within the ICU study setting. From this population, a sample of 97 participants was required to achieve a confidence level of 95% and margin of error of 5% (CheckMarket, 2020). Since this is the first known instance of this survey being adopted and administered to ICU medical practitioners and social workers in addition to registered nurses,

analyses were performed for each item of the survey as well as the eight concepts in order to identify specific areas requiring additional support. A comparison between the responses of RNs' and medical practitioners' survey responses was conducted. The small sample size of social worker participants did not allow for valid statistical comparison with either RNs or medical practitioners, but descriptive findings are reported in this manuscript for transparency of those surveyed. Parametric and non-parametric tests (independent samples t-test or Mann-Whitney U Test, respectively) were conducted for comparison between RNs and medical practitioners. Alpha has been set to 0.05. There has been no adjustment for multiple testing as such corrections can be overly conservative and fail to reveal potentially relevant findings. Substitution of missing data was not performed as any missing data (0.5% of all questions) was considered random (Little's Missing Completely at Random [MCAR] test $p= 0.09$).

RESULTS

Subjects' characteristics

One hundred healthcare professionals responded. Four respondents were excluded from final analysis due to survey incompleteness of 75% or more. Valid survey participants included: 75 RNs (75% response rate), 19 medical practitioners (76% response rate), and 2 social workers (SW) (66.7% response rate). See Table 2.

The mean age of the subjects was 38.1 years and was similar among professional groups (Table 2). Just over half reported completing their professional education in Australia, and length of

experience as a registered health professional ranged 1.5 to 40 years with length of experience in ICU ranging from 3 months to 37 years (Table 2).

[Table 2 near here].

Evidence for practice

RNs and medical practitioners reported similar scores for knowledge, preparedness, and patient and family preferences, although some differing responses to individual questions within the scales were observed (Table 3). Compared to medical practitioners, RNs reported higher scores related to receiving in-service education to assist with supporting and communicating with families of dying patients, receiving education in the care and management of patient symptoms, and higher scores for the question “I don't know what to say to the family of a patient at the end-of-life” (Table 3).

[Table 3 near here].

Context of practice delivery

RNs scored significantly higher than medical practitioners on the overall organisational culture scale (Table 4), specifically scoring higher related to the perception that EOLC becomes a nurse-led practice once the decision to withdraw care has been made (Table 4). In addition, RNs reported higher scores to the question: “When a patient dies in ICU, healthcare staff have sufficient time to spend with the family” (Table 4).

[Table 4 near here].

Facilitation of end-of-life care

Registered nurses and medical practitioners reported similar scores on palliative values, availability of emotional support, and patient care planning (Table 5). However, RNs report higher scores than medical practitioners in response to the question “After caring for a patient at the end-of-life, my colleagues will ask me if I am OK” and lower scores for the question “The medical staff support end-of-life care for dying patients in ICU” (Table 5).

[Table 5 near here].

DISCUSSION

This study is the first of our knowledge to explore, through survey, provisions of end-of-life care for ICU healthcare professionals as well as compare responses among RNs and medical practitioners. The main findings of this study are that overall, RNs and medical practitioners reported similar values concerning EOLC and patient and family preferences. However, differences were observed between professionals, specifically in relation to organisational culture and aspects of emotional support, education, and time availability.

Participants’ responses do suggest shared values among health professionals in relation to similar decision making, implementation, and end-of-life care. Participants mostly agreed that end-of-life care is as important as curative care, which is in contrast to what is sometimes termed a ‘denial of death’ approach to ICU medical treatment (Nelson, 2006) and has been previously

proposed to occur in larger hospitals (Long et al. , 2019). The similar values observed among the RNs and medical practitioners may contribute towards interprofessional cohesiveness and has been associated with greater job satisfaction and intent to stay (Gates and Mark, 2012). The prevalence of similar values likely also assists with emotional support since healthcare professionals commonly rely on each other as a coping strategy for dealing with a patient's death (Ffrench-O'Carroll et al. , 2019, Vanderspank-Wright et al. , 2018).

Despite similar fundamental end-of-life care values among participants, organisational culture was the only overall survey concept significantly different between the RNs and medical practitioners. In our survey, the organisational culture concept describes the perception of a nurse-led practice during EOLC (Ranse K, Yates P, 2015), and RNs in our survey reported higher perceptions of being left to manage the care of the patient after withdrawal of treatment. However, it is uncertain if the term "left" was perceived by survey participants as a negative or positive situation, and its relation to the level of perceived supports to enable delivery of end-of-life care.

Differences between RNs' and medical practitioners' responses could be attributed to silos of continuing education between the professions rather than an interprofessional approach since organisational culture is the shared basic assumptions, values, and beliefs that characterise an environment and are taught formally and informally to new employees as the proper way to think and feel (Schneider et al. , 2013). Though not entirely supported by these survey results, others have reported that the ICU medical consultants being a significant influence in the shaping of the unit's EOLC culture due to their decision-making role in the use of ICU technology and

resources (Baggs et al. , 2007), and the tradition of an intensivist-led model of ICU care. This model of care can support feelings of ICU medical practitioners' 'ownership' for the patient's decision making and is likely engrained into the experience and expectations of the ICU medical practitioners (Conn et al. , 2016), regardless of other factors that might favour EOLC being nurse-led such as the amount of time spent with the patient or the level of ICU specific care required. Other research has reported the role of the RN to be more dominant in end-of-life care and to include helping families understand treatment options based on the patient's actual or presumed wishes, managing patient's comfort, providing emotional support, facilitating cultural or religious practices, and creating positive memories for the families (Anderson RJ et al. , 2019, Raymond et al. , 2017, Riegel et al. , 2019).

Registered nurses and medical practitioners reported differing perceptions of receiving support when delivering EOLC. Supports can be received as either emotional support (sympathy and encouragement) or instrumental support (tangible aspects such as information or feedback), and the type of supports received varies in importance depending on the situation (Pohl and Galletta, 2017). In our survey, it is uncertain which type of supports played a larger role or how the supports affected the staff's perception of who leads EOLC.

Registered nurses reported lower levels of agreement than medical practitioners in relation to the question concerning medical staff supporting end-of-life care for dying patients, and medical practitioners reported receiving lower levels of emotional support in areas of peer-to-peer support and knowledge of counselling services. The process of changing a patient's plan of care from treatment to comfort relies on the deliberation between emotions and their learning

(Farjoun, Ansell, 2015). Decisions to change a patient's focus of care from curative to end-of-life can be a significant burden, and at times a distressing experience for the care providers (Childers and Arnold, 2019, Holms et al. , 2014, Konstantara et al. , 2016). Alternatively, providing medical treatment that healthcare professionals perceive to be too aggressive when they believe a patient is nearing their end-of-life has been reported to also cause intense moral distress for ICU healthcare professionals (Epstein et al. , 2019, Whitehead et al. , 2015). High levels of emotional support are required for healthcare professionals to be able to determine and deliver EOLC. Without this type of support, there is increased risk of experiencing emotional exhaustion and possible workplace burnout (Rotenstein et al. , 2018), which will further limit their ability to provide emotional support to co-workers, patients, and families.

Our findings suggest a need for more instrumental support with in-service education for aspects of end-of-life care including communication and symptom management, particularly for medical practitioners, which is consistent with prior studies (Brooks, Manias, 2017, Ffrench-O'Carroll, Feeley, 2019, Ho et al. , 2016, Mohamed et al. , 2016, Ozga et al. , 2020, Ranse, Delaney, 2020, Visser et al. , 2014). It is uncertain if the limited in-service educational opportunities are due to unavailability or a disinterest in attending sessions since ICU healthcare professionals have been previously reported to be less receptive to updating their knowledge and skills in EOLC, despite being committed to attending ongoing education in other skills such as ventilator management or cardiac perfusion (Levy, 2001). Overconfidence in abilities, rather than actual skills, has also been suggested to potentially contribute to resistance to attend ongoing training in end-of-life topics when they are available (Billings et al. , 2010).

The survey responses do suggest, though, that learning end-of-life topics is facilitated through managers' or supervisors' guidance when providing end-of-life care for both RNs and medical practitioners. While informal learning opportunities should be included, others have suggested that formal in-service education is also required because it cannot be assumed that skills in providing EOLC will be gained with experience over time (Vanderspank-Wright, Efstathiou, 2018), and managers' or supervisors' guidance at the bedside could be of better assistance as follow-up reinforcement training (Bonvicini et al. , 2009).

In our study, RNs reporting greater access to ongoing education about end-of-life care might provide them with increased skills and confidence to act as leaders for this aspect of patient care compared to the medical practitioners. The differences in received education and training to provide EOLC and manage patient symptoms may contribute to the RNs reporting being left to manage the patient's care as they might consider themselves as experts and are comfortable delivering and communicating about the care (Peden-McAlpine et al. , 2015, Vanderspank-Wright, Efstathiou, 2018). Equally, a deficiency in in-service education and training in EOLC topics might influence the medical practitioner's comfort level of being near death, especially if they view the death as a treatment failure and are uncertain how to deliberate between appropriate treatment options and possible emotional strain (Ho, Jameson, 2016, Levy, 2001, Visser, Deliens, 2014).

Compared to RNs, medical practitioners reported lower levels of agreement that healthcare professionals have enough time to spend with the family to provide for patient's and family's needs, and RNs also reported a lower level of agreement that medical staff support end-of-life

care for dying patients in the ICU. Once causes of illness are determined to be irreversible and a shift in care is made from curative to end-of-life, it is likely that the medical practitioners prioritise and reallocate their time to focus on other critically ill patients requiring their medical expertise. Alternatively, nurses report their physical presence and providing comfort as being a professional obligation in EOLC (Vanderspank-Wright, Efstathiou, 2018). Nurses being physically closer to the patient and family for typically longer periods of time places them in a greater position to facilitate and interpret verbal and nonverbal forms of communication, manage patient symptoms, and assist with rituals and comforts for the patient and family (Bloomer et al. , 2017, Hamric and Blackhall, 2007, Vanderspank-Wright, Efstathiou, 2018).

While the small sample size of social worker participants did not allow for comparisons with either RNs or medical practitioners, social worker participants reported drawing their knowledge for end-of-life care predominately from literature evidence, reported high levels of agreement to feeling prepared for EOLC, and were confident in speaking to families. They also reported high levels of agreement in the *facilitation* of end-of-life care, including palliative values, availability of emotional supports, and patient care planning. While unable to be broadly inferred due to low participant numbers, these responses are reflective of the social workers' unique and valuable role in ICU, which includes providing patient and family psychosocial assessments, counselling and support, facilitating communication, supporting health care professionals, and assisting in EOLC, including practical concerns such as funerals (Hartman-Shea et al. , 2011, Rose and Shelton, 2006).

Optimal delivery of end-of-life care requires a collaborative team approach by healthcare professionals to allow for their overlapping expertise and unique contributions to be combined to assist with decision making and working towards a common goal (Brooks, Manias, 2017, Carvajal, Haraldsdottir, 2019, Donovan et al. , 2018, Ely et al. , 2019). Providing interprofessional EOLC education is one intervention that has been reported to provide knowledge about the entirety of the patient's care outside of one's scope of practice, assist with communication between ICU disciplines, and promote teamwork (Graham et al. , 2018). When a team of healthcare professionals contribute to end-of-life decision making, rather than a subset group, all professions will be able to work to their full scope of practice (Ely, Azoulay, 2019).

This study highlights that potential opportunities for improvement exists, including emotional support, education, and time availability for healthcare professionals to provide high quality end-of-life care. Specifically, utilising an interprofessional approach to ongoing supports and education may facilitate opportunities to discover each profession's strengths and challenges, and foster better collaboration and peer emotional support when delivering end-of-life care. Additionally, such an approach to unit-based education and support may foster an organisational culture that encourages teamwork and shared decision-making during end-of-life care delivery.

LIMITATIONS

A limitation to this study is that values, culture, and supports provided to assist with EOLC will vary with each ICU and may not be representative of other ICUs. This study represents a self-selected sample of healthcare professionals and provides a snapshot of participant's perceptions

at one point in time. As such, results are only relevant to the healthcare professionals who participated and may not represent perspectives of those who did not participate, although some findings are consistent with prior studies and extend these findings. Statistical analysis in our study was also limited due to the sample size of medical practitioners and social workers. However, responses from each professional group were representative of the proportion of healthcare professionals within the study ICU.

CONCLUSION

Overall, healthcare professionals reported similar palliative values and inclusion of patient and family preferences, an important foundation for interprofessional cohesiveness where end-of-life care can be provided and expanded upon. The differences observed between registered nurses and medical practitioners would suggest that an interprofessional approach to ongoing supports and education may be beneficial as each profession brings unique values, perceptions, skills, and experiences to end-of-life care in the intensive care.

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TABLES

Table 1: Description of concepts measured related to provisions of end-of-life care adapted from Ranse et al. (2015)

Promoting Action on Research Implementation in Health Services (PARiHS) element	Survey concept	Description
<i>Evidence</i>	Knowledge	Availability of learning opportunities in continuing professional education
	Preparedness	Perception of one's ability to care for patient and family during end-of-life care
	Patient and family preferences	Inclusion of patient and family preference during end-of-life decision making
<i>Context</i>	Organisational culture	Perception of a nurse-led practice during end-of-life care
	Resources	Availability of environmental space, equipment, and staffing to provide end-of-life care
<i>Facilitation</i>	Palliative values	Expressed values of a palliative approach to care
	Emotional support	Staff's perception of support and assistance received from colleagues and managers while providing end-of-life care
	Care planning	Healthcare team's support for and agreement on a plan for end-of-life care

Table 2: Sociodemographic characteristics of study participants

	All staff <i>n</i>=96	Registered Nurses, <i>n</i>=75	Medical Practitioners, <i>n</i>=19	Social Workers, <i>n</i>=2
Age in years mean (SD)	38.1 (10.7)	38.7 (10.6)	35.4 (10.7)	42 (11.3)
Male	25 (26%)	14 (19%)	11 (57.9%)	0
Female	70 (73%)	60 (80%)	8 (42.1%)	2 (100%)
Did not state gender	1 (1%)	1 (1%)	0	0
Country of professional education				
Australia	52 (54.2%)	39 (52%)	11 (57.9%)	2 (100%)
United Kingdom of Great Britain and Northern Ireland and Ireland	31 (32.2%)	25 (33.3%)	6 (31.6%)	0
India	3 (3.1%)	2 (2.7%)	1 (5.3%)	0
Philippines	4 (4.2%)	4 (5.3%)	0	0
Other	6 (6.3%)	5 (6.7%)	1 (5.3%)	0
Highest level of education completed				
Hospital Certificate	4 (4.2%)	3 (4%)	1 (5.3%)	0
Bachelor's Degree	38 (39.6%)	27 (36%)	9 (47.4%)	2 (100%)
Post Graduate Certificate or Graduate Diploma	38 (39.6%)	36 (48%)	2 (10.5%)	0
Master's Degree	14 (14.6%)	9 (12%)	5 (26.3%)	0
PhD / Professional Doctoral	2 (2.1%)	0	2 (10.5%)	0
Mean length of experience in years as a registered health professional (SD)	14.8 (10.8)	15.4 (10.7)	10.9 (11)	14 (8.5)
Mean length of experience in years in ICU (SD)	10.2 (9.5)	11.1 (9.4)	7.1 (9.6)	4.5 (4.9)

Table 3: Evidence for practice: knowledge, preparedness, and patient and family preferences in end-of-life care results

	All staff, <i>n</i> =96	Registered Nurses, <i>n</i> =75	Medical Practitioners, <i>n</i> =19	Social Workers, <i>n</i> =2	Mann- Whitney U test of RNs and Medical Practitioners <i>p</i> value
Summary of concept score results	M (SD)	M (SD)	M (SD)	M (SD)	
Survey question					
Knowledge concept total scores	15.6 (5)	16.1 (4.7)	13.8 (5.7)	15 (7.1)	0.13
I have received in-service education that assists me to support and communicate with families of dying patients	3.9 (1.7)	4.2 (1.5)	2.8 (1.9)	3.0 (2.8)	0.002
I have received in-service education that assists me to provide care and manage patient symptoms at the end-of-life	3.8 (1.7)	4.0 (1.6)	3.0 (1.8)	3.0 (2.8)	0.02
I draw on evidence from the literature to provide end-of-life care to patients and their families	4.3 (1.3)	4.2 (1.3)	4.4 (1.3)	5.5 (0.7)	0.65
My postgraduate education included end-of-life care content relevant to the critical care context	3.5 (1.7)	3.5 (1.6)	3.7 (1.8)	3.5 (2.1)	0.59
Preparedness concept total scores	14.3 (2.8)	13.9 (2.7)	15.3 (2.8)	16 (2.8)	0.06
I feel adequately prepared to care for patients at the end-of-life	5.0 (1.0)	5.0 (1.0)	5.1 (0.9)	6.0 (0.0)	0.90
I don't know what to say to the family of a patient at the end-of-life. ^a	2.7 (1.5)	2.9 (1.5)	2.1 (1.3)	1.0 (0.0)	0.01
I have limited knowledge of symptom management for patients at the end-of-life. ^a	2.1 (1.1)	2.1 (1.1)	1.7 (0.9)	3.0 (2.8)	0.09
Patient and Family Preferences concept total scores	30.9 (3.3)	30.9 (3.4)	30.7 (2.9)	32 (2.8)	0.54
In ICU, families are given adequate time to consider decisions to	5.2 (0.8)	5.3 (0.8)	4.9 (1.0)	5.0 (0.0)	0.09

withhold/withdraw treatment for the patient					
In ICU, family meetings with the healthcare team are held to resolve differing views about a patient's treatment	5.1 (0.9)	5.1 (0.9)	4.9 (1.0)	5.5 (0.7)	0.50
In ICU, the patient's preferences (or their likely preference according to family) for end-of-life care are considered	5.1 (0.9)	5.0 (1.0)	5.4 (0.5)	5.5 (0.7)	0.09
In ICU, families are involved in decisions about the dying patient	5.1 (0.7)	5.1 (0.8)	5.3 (0.6)	5.5 (0.7)	0.24
In ICU, withdrawal of treatment is delayed whilst waiting for relatives of the patient to arrive	5.1 (0.7)	5.2 (0.7)	4.8 (0.8)	5.0 (0.0)	0.12
When a patient dies in ICU, families have sufficient time to spend with the patient	5.3 (0.9)	5.3 (0.9)	5.3 (0.8)	5.5 (0.7)	0.90

n= number of survey responses; M= mean; SD= standard deviation

a: Question reversed to calculate factor's summary scores

Table 4: Context of practice delivery: organisational culture and resources results

	All staff, <i>n</i> =96	Registered Nurses, <i>n</i> =75	Medical Practitioners, <i>n</i> =19	Social Workers, <i>n</i> =2	Mann- Whitney U test of RNs and Medical Practitioners
<i>Summary of concept score results</i>	M (SD)	M (SD)	M (SD)	M (SD)	<i>p</i> value
Survey question					
<i>Organisational Culture concept total scores</i>	11.5 (2.7)	11.9 (2.5)	9.9 (2.9)	9.5 (4.9)	0.01
After a decision is made to withdraw treatment, less time is spent with the patient by the critical care medical team	4.6 (1.2)	4.7 (1.2)	4.1 (1.3)	3.5 (2.1)	0.06
After a decision is made to withdraw treatment, nurses are left to manage the care of the patient	4.2 (1.3)	4.5 (1.2)	3.2 (1.3)	4.5 (2.1)	<0.001
In ICU, end-of-life care is mostly allocated to junior healthcare staff	2.7 (1.2)	2.7 (1.2)	2.6 (1.4)	1.5 (0.7)	0.56
<i>Resources concept total scores</i>	21.6 (4.2)	21.9 (4)	20.9 (5)	18.5 (3.5)	0.69
The physical environment of ICU is ideal for providing end-of-life care	3.5 (1.3)	3.5 (1.4)	3.5 (1.3)	3.0 (1.4)	0.98
ICU is adequately equipped to support the comfort needs of the family during end-of-life care	4.0 (1.2)	4.0 (1.2)	4.1 (1.4)	4.0 (1.4)	0.83
Private rooms are available to care for the patient at the end-of-life	4.4 (1.1)	4.4 (1.1)	4.4 (1.2)	4.0 (0.0)	0.91
ICU is adequately staffed for providing the needs of dying patients and their families	5.0 (0.9)	5.1 (0.8)	4.8 (1.3)	4.5 (0.7)	0.49
When a patient dies in ICU, healthcare staff have sufficient time to spend with the family	4.6 (1.1)	4.8 (1.0)	4.1 (1.1)	3.0 (2.8)	0.01

n= number of survey responses; M= mean; SD= standard deviation

Table 5: Facilitation of end-of-life care: palliative values, emotional support, and care planning results

	All staff, <i>n</i> =96	Registered Nurses, <i>n</i> =75	Medical Practitioners, <i>n</i> =19	Social Workers, <i>n</i> =2	Mann- Whitney U test of RNs and Medical Practitioners <i>p</i> value
Summary of concept score results	M (SD)	M (SD)	M (SD)	M (SD)	
Survey question					
<i>Palliative Values concept total scores</i>	28.5 (2)	28.4 (2)	28.8 (1.8)	29.5 (0.7)	0.53
End-of-life care is as important as curative care in the critical care environment	5.7 (0.7)	5.7 (0.6)	5.7 (0.8)	6.0 (0.0)	0.89
I can influence the patient and family's experience of end-of-life care	5.6 (0.7)	5.6 (0.7)	5.6 (0.6)	6.0 (0.0)	0.73
End-of-life care should include care of the patient's family	5.8 (0.4)	5.8 (0.4)	5.8 (0.4)	6.0 (0.0)	0.71
It is a privilege to care for a patient at the end-of-life and their family	5.7 (0.6)	5.6 (0.7)	5.8 (0.4)	6.0 (0.0)	0.44
Analgesia should be titrated to keep the patient comfortable even if this hastens death	5.7 (0.6)	5.7 (0.6)	5.9 (0.3)	5.5 (0.7)	0.13
<i>Emotional Support concept total scores</i>	27.9 (4.6)	27.9 (4.7)	27.5 (4.1)	32.5 (0.7)	0.48
My supervisors/managers ensure staff caring for patients at the end-of-life are supported	4.9 (1.0)	4.8 (1.1)	5.2 (0.8)	5.5 (0.7)	0.08
My supervisors/managers provide guidance that assists me to provide end-of-life care	4.9 (0.9)	4.8 (0.9)	5.2 (0.7)	5.0 (1.4)	0.10
After caring for a patient at the end-of-life, my colleagues will ask me if I am OK	4.2 (1.3)	4.3 (1.2)	3.6 (1.4)	5.0 (0.0)	0.02
I feel supported when caring for a patient at the end-of-life	4.7 (1.0)	4.6 (1.0)	5.0 (0.8)	5.5 (0.7)	0.14
My colleagues appreciate the stressors associated	4.8 (1.0)	4.8 (0.9)	4.6 (1.1)	5.5 (0.7)	0.80

with caring for patients at the end-of-life					
When a patient dies in ICU, counselling is available if I need it	4.5 (1.2)	4.7 (1.2)	3.8 (1.0)	6.0 (0.0)	0.01
<i>Care Planning concept total scores</i>	27.8 (4.6)	27.3 (4.8)	29.2 (3.5)	30 (1.4)	0.22
The medical staff support end-of-life care for dying patients in ICU	4.8 (1.0)	4.6 (1.0)	5.2 (0.9)	6.0 (0.0)	0.02
In ICU, when a diagnosis with a likely poor outcome is made, families are informed of end-of-life care options	4.7 (1.0)	4.7 (1.1)	4.9 (0.8)	5.0 (0.0)	0.55
In ICU, the team expresses its opinions, values and beliefs about providing care to dying patients	4.3 (1.2)	4.2 (1.2)	4.6 (0.8)	3.0 (2.8)	0.27
All members of the healthcare team in ICU agree with and support end-of-life care when it is implemented	4.9 (1.0)	4.9 (1.0)	4.5 (1.0)	5.5 (0.7)	0.10
In ICU, a plan of care for the patient is clearly documented by the medical team	4.4 (1.3)	4.3 (1.3)	4.8 (1.0)	5.5 (0.7)	0.14
In ICU, the critical care team and the patient's primary medical or surgical team agree on a plan of care	4.7 (1.0)	4.6 (1.1)	5.0 (0.7)	5.0 (0.0)	0.20

n= number of survey responses; *M*= mean; *SD*= standard deviation