

BMJ Open Towards definitions of critical illness and critical care using concept analysis

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ABSTRACT

Objective As ‘critical illness’ and ‘critical care’ lack consensus definitions, this study aimed to explore how the concepts’ are used, describe their defining attributes, and propose potential definitions.

Design and methods We used the Walker and Avant approach to concept analysis. The uses and definitions of the concepts were identified through a scoping review of the literature and an online survey of 114 global clinical experts. We used the Arksey and O’Malley framework for scoping reviews and searched in PubMed and Web of Science with a strategy including terms around critical illness/care and definitions/etymologies limited to publications in English between 1 January 2008 and 1 January 2020. The experts were selected through purposive sampling and snowballing, with 36.8% in Africa, 25.4% in Europe, 22.8% in North America, 10.5% in Asia, 2.6% in South America and 1.8% in Australia. They worked with anaesthesia or intensive care 59.1%, emergency care 15.8%, medicine 9.5%, paediatrics 5.5%, surgery 4.7%, obstetrics and gynaecology 1.6% and other specialties 3.9%. Through content analysis of the data, we extracted codes, categories and themes to determine the concepts’ defining attributes and we proposed potential definitions. To assist understanding, we developed model, related and contrary cases concerning the concepts, we identified antecedents and consequences to the concepts, and defined empirical referents.

Results Nine and 13 articles were included in the scoping reviews of critical illness and critical care, respectively. A total of 48 codes, 14 categories and 4 themes were identified in the uses and definitions of critical illness and 60 codes, 13 categories and 5 themes for critical care. The defining attributes of critical illness were a high risk of imminent death; vital organ dysfunction; requirement for care to avoid death; and potential reversibility. The defining attributes of critical care were the identification, monitoring and treatment of critical illness; vital organ support; initial and sustained care; any care of critical illness; and specialised human and physical resources. The defining attributes led to our proposed definitions of critical illness as, ‘a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility’, and of critical care as, ‘the identification, monitoring and treatment of patients with critical illness through the initial and sustained support of vital organ functions.’

Conclusion The concepts critical illness and critical care lack consensus definitions and have varied uses. Through

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ This concept analysis is the first study to systematically describe the uses and definitions of the concepts *critical illness* and *critical care*.
- ⇒ The study uses a scoping review of the literature and input from over 100 clinical experts from diverse settings globally to identify the defining attributes and provide proposed definitions of the concepts.
- ⇒ Some uses and definitions of the concepts in languages other than English, in unpublished grey literature and from clinical experts not included in the study may have been missed.
- ⇒ As current usage of the concepts is diverse, the proposed definitions may not be universally accepted and are aimed to stimulate further discussion.

concept analysis of uses and definitions in the literature and among experts, we have identified the defining attributes of the concepts and proposed definitions that could aid clinical practice, research and policy-making.

INTRODUCTION

The concepts *critical illness* and *critical care* are commonly used in healthcare. In PubMed, both concepts are Medical Subject Headings terms, and searches for ‘critical illness’ or ‘critical care’ return 40 000 and 220 000 articles, respectively. While it may seem evident that the concepts concern patients with very serious illness and their care, there is a lack of consensus around their precise definitions.

Critical illness is a concept concerning a patient’s condition that is distinct from the disease diagnosis. It has been argued that clinical practice is overly guided by diagnoses rather than prognoses.¹ We postulate that the lack of consensus around prognostic concepts such as critical illness may be one factor in this and could cause problems for clinical practice, research and policy-making. For the clinician, discordant interpretations of when a patient is critically ill could lead to differing clinical assessments and treatments despite similar states: for example, Doctor A interprets Patient B’s low blood oxygen



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level as critical illness, triggers an alarm and admits the patient to an intensive care unit (ICU), only for Doctor C to reverse the decision and discharge the patient as she interprets the illness as non-critical. For the researcher, it could be difficult to design a study or interpret findings: for example, studies into the effect of dexamethasone for critical COVID-19, or of another treatment for all patients with critical illness, require clear eligibility criteria and translating the findings to another patient group requires that the groups have similar clinical conditions. For the policy-maker, prioritising programmes and investments designed to improve care for very sick patients relies on comparisons between similar groups and clearly defined interventions.

Even quantifying the total global burden of critical illness has been challenging due to the lack of an agreed definition.² Proxies have been used instead, for example, summing up syndromes considered to comprise critical illness such as sepsis and acute lung injury—resulting in estimates of up to 45 million critical illness cases each year.² Low-income and middle-income countries are suspected to have the highest burden,³ but the lack of a definition has hampered comparisons across settings.⁴

Studying the care for critically ill patients has also been problematic. Studies have focused on care provided in hospital locations such as in intensive care or emergency units, which exclude both the care provided in hospitals lacking such units, and the care of critically ill patients in general hospital wards.^{5–7} In the COVID-19 pandemic, there have been great efforts to describe, scale-up and improve care for critically ill patients throughout the world,^{5–7} and a lack of agreement around the concept of critical care has hampered these efforts.^{8,9}

These examples illustrate how important *concepts* are as the building blocks of theories and communication. Ideally, concepts are clearly defined and their uses well described for unambiguous communication and an understanding about exactly what is being described or explained.¹⁰ *Concept analysis* is a method for investigating how concepts are used and understood. Concept analyses have been conducted in diverse fields such as in teamwork,¹¹ postoperative recovery¹² and bioterrorism preparedness,¹³ all with the aim of providing basic conceptual understanding and facilitating communication. In this paper, we have used concept analysis, following the stepwise approach described by Walker and Avant.¹⁰ The first two steps in the approach are to choose the concept and determine the aim of the analysis. Our chosen concepts are *critical illness* and *critical care* and our aims are to explore the uses and definitions of the concepts in published sources and by global clinical experts, leading to a description of the defining attributes of the concepts and to proposed definitions.

METHODS

Concepts are the basic building blocks in theory construction, research and communication. A concept analysis

aims to define the concept's attributes and facilitate decisions about which phenomena match the concept, and which do not. In this study, Walker and Avant's method for concept analysis was chosen as a systematic approach used previously in similar studies.¹⁰ The approach consists of eight steps: (1) select the concept; (2) determine the aim of analysis; (3) identify all uses of the concept that you can discover; (4) determine the defining attributes; (5) identify a model case; (6) identify borderline, related, contrary, invented and illegitimate cases; (7) identify antecedents and consequences; (8) define empirical referents. In this paper, steps 1 and 2 are described in the Introduction section, step 3 in the Method section and steps 4–8 in the Results section. Thus, the continuation of this article addresses steps 3–8 in Walker and Avant's method.¹⁰

Step 3: identifying the uses of the concepts

We identified the uses of the concepts of critical illness and critical care through a scoping review of the literature and a web-based survey of global experts.

Scoping review

We used the Arksey and O'Malley framework for scoping reviews.¹⁴ Relevant studies published in English between 1 January 2008 and 1 January 2020 were identified in the PubMed and Web of Science databases. We began the search in 2018 and deemed that articles published prior to 2008 were more than 10 years old and would have less relevance. To include publications that were not found through the database searches, we hand-searched publication lists and grey literature of intensive care medicine and emergency medicine societies. Duplicates were removed using the software Rayyan.¹⁵ The publications were examined through title, then abstract review and lastly by full-text review. The scoping review protocols were published in advance on the www.protocols.io database.

Critical illness

The search strategy used the terms terminolog*, etymolog*, nomenclatur*, OR definition*, AND emergency, critical*, acute*, OR sever*, AND ill OR illness. A total of 9323 articles were identified using these critical illness terms in the databases and an additional two articles were identified through hand searching. Of these, 1126 articles were identified as duplicates and the remaining 8199 articles were screened by title and abstract review by two of the authors (TT and HM). Eight thousand one hundred sixty-eight articles were excluded as they did not concern critical illness, were not written in English or were not available in full text online, leaving 31 articles for inclusion for full-text review. In the full-text review, 22 articles were excluded as they did not define critical illness, and so 9 articles were included in the analysis (figure 1 and online supplemental table 1).

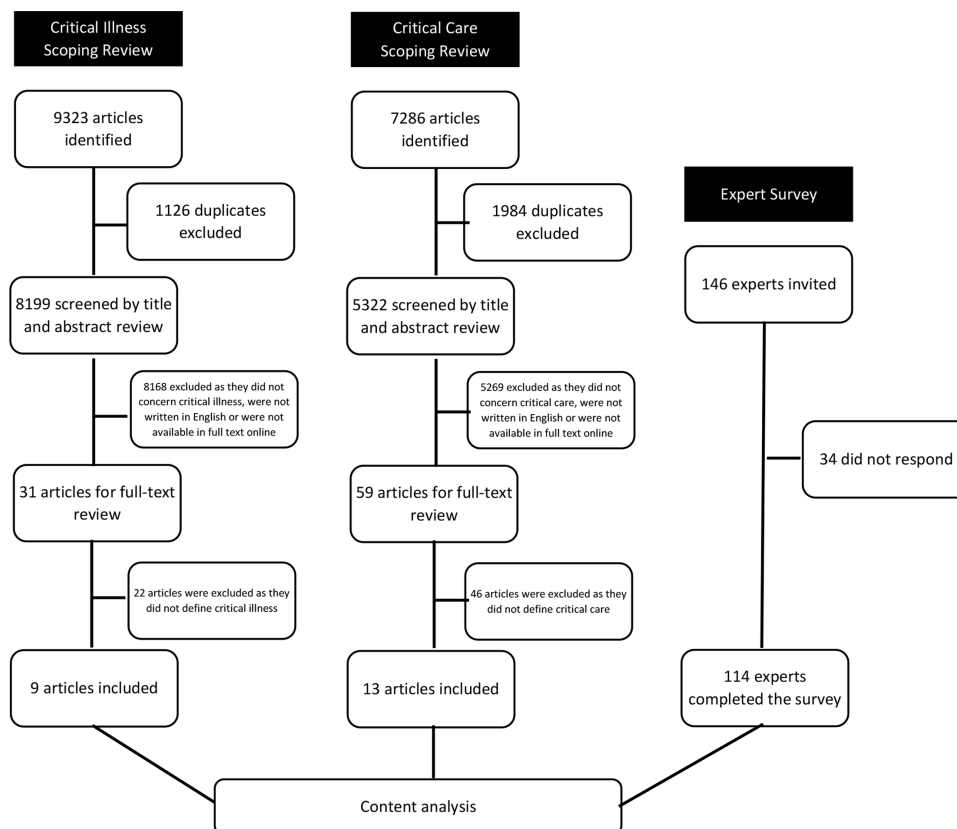


Figure 1 Study flow chart.

Critical care

The search strategy used the terms terminolog*, etymolog*, nomenclatur*, OR definition*, AND critical care, intensive care, emergency care, OR acute care. A total of 7286 articles were identified using these critical care terms in the databases and an additional 6 articles were identified through hand searching. Of these, 1964 were identified as duplicates and the remaining 5322 articles were screened by title and abstract review by two of the authors (TT and HM). Five thousand two hundred sixty-nine articles were excluded as they were not concerning critical care, not written in English or not available in full text online, leaving 59 articles for inclusion for full-text review. In the full-text review, 46 articles were excluded as they did not define critical care and so 13 articles were included in the analysis (figure 1 and online supplemental table 2).

Expert survey

The survey used open-ended questions to gather information about the experts' definitions of critical illness and critical care, and how they see the relationship of the concepts to connected concepts in order to provide context. The survey included the questions: (1) *How would you define critical illness?* (2) *How would you define critical care?* (3) *Do critical care and intensive care differ? If yes, in what way?* (4) *Do critical care and emergency care differ and if yes, in what way?* (5) *Do critical care and acute care differ and if yes, in what way?*

The inclusion criterion for an expert to be invited to participate in the survey was experience in any medical specialty that includes care of patients with acute, severe illness. Experts were identified from a stakeholder mapping of global critical care done by one of the authors (TB, unpublished), and those known to the researchers to be global experts in the field of critical care. Purposive sampling was used to invite experts with the aim of including 100 experts with a balance between specialties, geographical locations, health worker cadres and gender. In total 146 experts were invited to take part, and 114 completed the survey (78% response rate) (figure 1 and table 1).

Step 4: analysis and determining the defining attributes

All the definitions and usages of critical illness and critical care from the scoping reviews and the expert survey were charted and analysed using a content analysis based on methods developed by Erlingsson and Brysiewicz.¹⁶ First, the data from any parts of the literature and from the expert survey that concerned the uses or definitions of the concepts were extracted. The data were coded, and the codes analysed iteratively by the study team. Repeated and redundant codes were removed and similar codes were arranged into categories. The data were revisited when new categories arose or when diverse opinions with contrasting attributes were identified. Through the process, themes emerged that captured the defining attributes of the concepts. Using the defining attributes,

Table 1 Characteristics of the experts who participated in the survey

Variable	Frequency (%)
All	114
Gender	
Male	80 (70.2)
Female	34 (29.8)
Continent	
Africa	42 (36.8)
Europe	29 (25.4)
North America	26 (22.8)
Asia	12 (10.5)
South America	3 (2.6)
Australia	2 (1.8)
Cadres*	
Physician	93 (53.1)
Researcher	62 (35.4)
Nurse	12 (6.9)
Policy-maker	5 (2.9)
Other	3 (1.7)
Specialty*	
Anaesthesia/intensive care	75 (59.1)
Emergency care	20 (15.8)
Medicine	12 (9.5)
Paediatrics	7 (5.5)
Surgery	6 (4.7)
Obstetrics and gynaecology	2 (1.6)
Other	5 (3.9)

*As the experts were asked to select all that apply, the sum may exceed 100%.

definitions of the concepts were constructed by the research team to be coherent and useful.

Steps 5–8: presenting a model case, related and contrary cases, identifying antecedents and consequences, and defining empirical referents

The model cases, related and contrary cases were developed by the researchers to provide examples to illustrate the defining attributes of the concepts that emerged from the concept analysis. Model cases were developed to be clinically realistic and to include all the defining attributes. Related cases were developed that include some, but not all, of the defining attributes, and contrary cases that are clearly ‘not the concept’, containing none of the defining attributes. For simplicity in this study, we limited our cases to examples of patients with respiratory disease. Antecedents and consequences were identified as events that occur prior to the occurrence of each concept and as the outcomes of each concept, respectively. Empirical

referents were identified as phenomena that demonstrate the occurrence of each concept ‘in real life’.

Ethical considerations

Informed consent was provided by all of the experts. The Research Ethics Committee of the London School of Hygiene and Tropical Medicine approved the study (reference number 22661).

Patient and public involvement

None.

RESULTS

The results relate to steps 4–8 in the Walker and Avant approach, as steps 1–3 have been described in the Introduction and Methods.

Critical illness

Step 4: the defining attributes

A total of 48 codes were identified from the uses and definitions of critical illness from the scoping review and expert survey. The codes were analysed into 14 categories and 4 themes. (table 2). The themes represent the defining attributes of critical illness: *high risk of imminent death*; *vital organ dysfunction*; *requirement for care to avoid death*; and *potential reversibility* (figure 2).

Proposed operational definition

The proposed definition for critical illness is ‘Critical illness is a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility.’

Cases

Step 5: a model case of critical illness (a case including all the defining attributes)

A woman has a viral pneumonia. She is breathless and hypoxic with a low oxygen level in her blood (oxygen saturation) of 74%. Her lungs are dysfunctional, and she has a life-threatening condition that is likely to lead to her death in the next few hours. She requires care to support her lungs (oxygen therapy) and if she receives that care, she has a chance of recovery.

Step 6: a related case for critical illness (a case including some of the defining attributes but not the attribute of ‘imminently life-threatening’)

A man has a chest infection. He has a fever, is coughing up green sputum and feels short-of-breath when walking. He has an oxygen saturation of 91%. He has a serious condition, but it is not imminently life-threatening. He requires treatment, likely with antibiotics, but it is uncertain whether he requires any organ support such as oxygen. His condition is potentially reversible, and he can recover.

Table 2 Content analysis for the concept *critical illness*

Code	Category	Theme
Severe illness	Severe illness	High risk of imminent death
Process of increasing severity		
Imminent risk of death	High risk of imminent death	
Enough severity to lead to death rapidly		
Can kill within a short time		
Medical condition that results in short-term mortality		
Sudden onset illness or acute deterioration	Acute onset or deterioration	
Acute life-threatening illness		
An episode of acute illness		
Increased risk of death	Life-threatening	
Continuous threat to life and well-being		
Life-threatening or potentially life-threatening disease		
High probability of life-threatening deterioration		
Acutely life-threatening injury or illness		
At least one and often multiple organ dysfunction	Organ dysfunction or failure	Vital organ dysfunction
Failure in one or more organ systems that needs support		
Haemodynamic instability, respiratory failure, seizure, disorders of consciousness		
Diseases with vital organ failures as complications		
Threatened organ failure	Threatened organ dysfunction	
Potential disturbances of vital organ functions		
Threatened end-organ damage		
Deranged vital parameters	Vital signs derangements	
Physiologic reserve is diminished, as manifested by abnormal vital signs		
NEWS2 \geq 7		
Associated with significant morbidities if untreated	Treatment needed to avoid death	Requirement for care to avoid death
Decline in a patient's ability to survive on their own		
Conditions requiring rapid intervention to avert death or disability		
An illness which without rapid treatment would result in death or disability.		
Needs prompt and sustained intervention to avert death or lifelong disability		
If no intervention is made, death is certain		
Requiring minute-by-minute nursing and/or medical care	Requirement for immediate treatment	
Requires a rapid diagnosis and response to ensure good outcomes		
Illnesses where timely care can reduce the chances of death and disability		
Requires immediate intervention		
The illness needs close monitoring and prompt management		
Treatment delays of hours or less make interventions less effective		
Requiring organ support	Requirement for organ support	
Requiring vital organ support		
Requiring intensified patient monitoring and organ support		
Critical care services	Requires critical care	
ICU admission		
Illness that results in need for more than standard of care	Need for specific care	
Acute disease that needs specific treatment alongside the disease itself		

Continued

Table 2 Continued

Code	Category	Theme
Some element of treatability	Reversible with treatment	Potential reversibility
Any treatable life-threatening reversible illness		
Reversible life-threatening organ failure	Potentially reversible	
Life-threatening situation, illness or disease that is potentially reversible		
Acute potentially reversible illness		
NEWS, National Early Warning Score.		

A contrary case for critical illness (a clear example of 'not the concept')

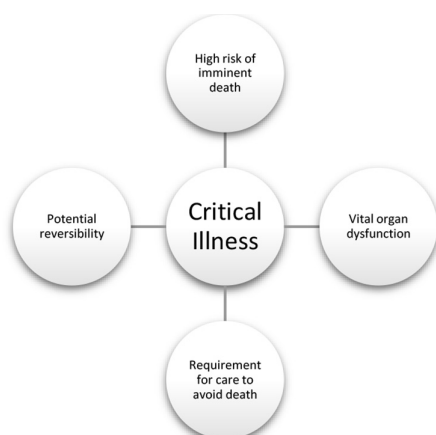
A woman has lung cancer. She is coughing up small amounts of blood but is able to walk to the hospital. She has an oxygen saturation of 94%. She is sick and she requires treatment. However, her illness is not imminently life-threatening, she has no dysfunctional vital organ and she does not require immediate care. Her condition may or may not be reversible.

Step 7: antecedents and consequences of critical illness

The antecedents of critical illness are the onset of illness, in mild or moderate form, with progressing severity. The consequences of critical illness are either recovery or death.

Step 8: empirical referents

There are an estimated 30–45 million cases of critical illness globally each year.² Many patients are cared for in hospitals with illnesses that are causing vital organ dysfunction and that are imminently life-threatening. There is much work done to identify patients with critical illness such as the use of single severely deranged vital signs,¹⁷ or compound scoring systems such as the National Early Warning Score and The Sequential Organ Failure Assessment score.^{18 19} In hospitals, the severity of patients' conditions can be assessed using tools such as the Acute Physiology and Chronic Health Evaluation²⁰ and the Simplified Acute Physiology Score.²¹

**Figure 2** The defining attributes of critical illness.

Critical care

Step 4: the defining attributes

A total of 60 codes were identified from the definitions of critical care from the scoping review and expert survey. The codes were analysed into 13 categories and 5 themes (table 3). The themes represent the concept's defining attributes: *identification, monitoring, and treatment of critical illness; vital organ support; initial and sustained care; any care of critical illness; and specialised human and physical resources* (figure 3).

Proposed operational definition of critical care

The proposed definition for critical care is "Critical care is the identification, monitoring, and treatment of patients with critical illness through the initial and sustained support of vital organ functions."

Cases

Step 5: a model case of critical care (a case including all the defining attributes)

A woman with a viral pneumonia is rapidly identified as critically ill when she arrives at the hospital. She is immediately admitted to a unit with supplies for managing critically ill patients and treatment is started. Nurses and doctors who have been trained in the care of critical illness monitor her regularly, and provide continuous care, titrating the treatments as needed. Continuous oxygen therapy is provided for her life-threatening hypoxia, supporting her respiratory dysfunction, until she has recovered and is no longer critically ill.

Step 6: a related case of critical care (a case including some of the defining attributes but not the attribute of 'vital organ support')

Care in a hospital is provided to a man with a chest infection. A nurse assesses him at arrival to hospital. A doctor admits him to the ward, prescribes antibiotics and decides he is not critically ill and does not require support for any of his vital organs. After 4 days, the doctor discharges him from hospital.

A contrary case of critical care (a clear example of 'not the concept')

In the outpatient department, care is provided to a woman with lung cancer. A doctor and a nurse do some investigations and prescribe some medications. She is sent home with a follow-up appointment 2 weeks later.

Table 3 Content analysis for the concept *critical care*

Codes	Category	Theme
Identifying and addressing critical illness	Identification and monitoring of critical illness	Identification, monitoring and treatment of critical illness
Medical care with timely monitoring		
Appropriate monitoring of critical illness		
Management of critically ill patients		
Treat critical illness		
Care given to the critically ill		
Services required to stabilise critical illness		
Reduce the risk of death from a critical illness		
Care dedicated to patients with severe illness or potentially severe condition		
Managing life-threatening condition	Addressing life-threatening condition	
Preventing the occurrence of life-threatening conditions		
Treatment and management due to the threat of imminent deterioration		
Medical care required to reduce the risk to the patient's life		
Care to sustain cardiopulmonary functions	Supporting vital functions	Vital organ support
Support the patient's haemodynamic or cardiorespiratory status		
Supportive care in critical illness to enable body's systems to continue functioning before definitive treatment can work		
Care of vital organ failure		
Focus of care on supporting vital organs until improvement		
Providing organ support		
Main focus on organ-supporting treatment.		
Support of vital organ function, or reverse specific organ dysfunctions		
Supportive care for organs that are failing		
Provision of support to dysfunctional body systems	Timely care	Initial and sustained care
Early management for saving and maintaining life		
Rapid and timely intervention that is administered in critical illness		
From admission until the course of illness ends, either in full recovery or death		
From home through to discharge from hospital	From start of critical illness until the patient is no longer critically ill	
From the time of first contact with healthcare services through to stabilisation		
To the point where the illness or injury is no longer acutely life-threatening		
Critical care could be over days to weeks		
Constant monitoring	Sustained care	
Irrespective of the location of the patient within the health system		
Anywhere in the emergency or inpatient setting	Any location	Any care of critical illness
Any care provided to critically ill patients		
Can be specialised care but depends on the level of resources		

Continued

Table 3 Continued

Codes	Category	Theme
Usually located in an area with infrastructure to support these activities	Specific area	Specialised human and physical resources
Inside a healthcare facility, outside the emergency department		
High dependency care		
Care in ICU or critical care unit		
A place where equipment, staff and environment is ready to save patients with life-threatening disease	Multidisciplinary and specialist staff	
Multidisciplinary care		
Specially trained staff		
Essentially a team based and multiprofessional care		
Requires the grouping of special facilities and specially trained staff	High-intensity care	
Higher level of care than is available on a general ward		
Minute-by-minute nursing and/or medical care		
Advanced respiratory support/mechanical ventilation		
Nursing 24/7		
High nurse: patient ratio no lower than 1:2		
ICU, intensive care unit.		

Step 7: antecedents and consequences of critical care

The antecedents of critical care are the contact of the patient with the healthcare system and may include other care of a patient who has not deteriorated to the point of becoming critically ill. The consequences of critical care are either the patient's recovery or death.

Step 8: empirical referents

Many hospitals have wards or units for the provision of critical care, such as emergency units, high dependency units or ICUs.²² Critical care can also be provided in general wards, and a recent global consensus specified the care that should be included for all patients with critical illness in any hospital location.²³ Rapid Response Teams

or Medical Emergency Teams have been introduced into some hospitals, often consisting of staff from the ICU responding to calls from the wards when a critically ill patient has been identified, and providing either critical care on the ward, or transferring the patient to the ICU.²⁴

DISCUSSION

We have described how the concepts *critical illness* and *critical care* are used and defined in the literature and by a selection of global experts using a concept analysis approach.

Our proposed definition for critical illness of, "a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility", is similar to those in some key publications. Chandrashekar *et al* state that, "Critical illness is any condition requiring support of failing vital organ systems without which survival would not be possible".²⁵ Painter *et al* write that, "A critically ill or injured patient is defined as one who has an illness or injury impairing one or more vital organ systems such that there is a high probability of imminent or life-threatening deterioration in the patient's condition".²⁶ Indeed, we found widespread agreement in the literature and expert sources that critical illness concerns the attributes 'life-threatening illness' and 'organ dysfunction'.

However, we found diverse and varied usage of the concept concerning the attribute of reversibility and the interface between critical illness and the natural process of dying. Some uses included only illness that

**Figure 3** The defining attributes of critical care.

was potentially reversible—these sources regarded that for critical illness there should be a possible chance of recovery. Without this, critical illness would be a concept that encompasses the dying process—everyone would be critically ill immediately before death—which would conflict with many clinical uses and understandings of the term. Others had a wider interpretation including all life-threatening illness and did not include reversibility in the definition as it is difficult to identify in the clinical setting, and the concept risks becoming context dependent (high-resource interventions may reverse some critical illness which would not be possible in low-resource healthcare). Our iterative content analysis method led to our interpretation that reversibility should be included as one of the defining attributes and to make a distinction between critical illness and illness at the end of life.²⁷ This conclusion should be seen as one possible interpretation that can stimulate further discussion.

It is hoped that the proposed definition of critical illness assists communication in the field. Previously, studies about critical illness have focused on patients in certain hospital units, or with diseases or syndromes as proxies for critical illness that exclude some critically ill patients.^{2 5} Our definition of critical illness is not diagnosis or syndrome specific and can be due to any underlying condition. The definition could facilitate the specification of clinical criteria for the identification of critical illness, estimates of the overall burden of critical illness, assessments of outcomes for patients with critical illness across centres and settings, and interventions to improve outcomes.

For critical care, there was greater diversity around its use and definition. There was widespread agreement that critical care included the attributes of, ‘care of critically ill patients’, and the ‘support of vital organs’. However, there were differing uses around the location of the care and the need for specialised resources. Some sources considered critical care to be only the care provided in certain locations (such as ICUs or critical care units) or to be care that is always highly specialised or resource intensive. The World Federation of Societies of Intensive and Critical Care Medicine have suggested that critical care is synonymous with intensive care and is, “a multidisciplinary and interprofessional specialty dedicated to the comprehensive management of patients having, or at risk of developing, acute, life-threatening organ dysfunction. [Critical care] uses an array of technologies that provide support of failing organ systems, particularly the lungs, cardiovascular system, and kidneys.”²² In contrast, other sources used critical care to be inclusive of any care for patients with critical illness, irrespective of location or resources. The Joint Faculty of Intensive Care Medicine of Ireland state that critical care units are those that, “provide life sustaining treatment for critically ill patients with acute organ dysfunction due to potentially reversible disease”,²⁸ and in Belgium, critical care beds have been defined as any beds “for patients with one or more organ functions compromised”⁴ Hirshon *et al* strike a balance

between these two contrasting views, “[Critical care is] the specialized care of patients whose conditions are life-threatening and who require comprehensive care and constant monitoring, usually in intensive care units.”²⁹

Our proposed definition of, “the identification, monitoring, and treatment of patients with critical illness through the initial and sustained support of vital organ functions”, aims to be inclusive. Critical care may include the use of specialised resources, but it is not a requirement. We see this as a strength in the definition, as it maintains a patient-centred rather than setting-dependent focus. Critical care when defined in this way can be provided anywhere, and does not have to be resource intensive—it includes both high-resource care in ICUs and lower resource care in other settings. Indeed, critical care can be provided in general wards, in small health facilities, in the community or in ambulances. High-resource intensive care may not be possible in low-resource settings, but such settings care for many critically ill patients who require critical care.^{6 30 31} The proposed definition focuses on supporting vital organ functions, emphasising that critical care’s primary focus is treating the critical condition of the patient rather than definitive care for the underlying condition.^{9 32} Critical care, as we have defined it, can be seen as a system of care of patients with critical illness throughout the course of their illness, from the time of their first contact with healthcare through to resolution of the critical illness or death. Critical care is part of the wider concept of acute care which also includes prehospital care, emergency care, trauma and surgery care, as well as inpatient care in medical, surgical, paediatric, obstetric and other wards.²⁹

The word ‘crisis’ is the root for the word critical and has its origin from the Greek word ‘krisis’ referring to a ‘turning point’ or ‘act of separation’, and later in English in a medical context when a crisis refers to the decisive point at which a patient either improves or deteriorates.³³ The concepts critical illness and critical care could be regarded as remaining true to these origins as they refer to the point in a patient’s ‘journey’ through their illness where they are so severely ill that the situation has become a crisis, and managing the crisis is necessary to direct the patient towards improvement rather than towards deterioration.

Strengths and limitations

To our knowledge, this is the first study attempting to describe the uses and definitions of the concepts *critical illness* and *critical care*, and to identify the defining attributes leading to proposed definitions of the concepts. A strength is the use of both a scoping review of the literature and the inclusion of over one hundred clinical experts as sources. The findings of the analysis should be seen as a first step towards consensus and we recognise that the use of concepts is fluid and changes over time.¹⁰ We were limited to including literature in English between 2008 and 2019 and to published studies and guidelines and we may have missed relevant publications

in other languages or in other grey literature. Our sample of experts was purposively selected and had global representation but was not perfectly symmetrical to continents, specialty, cadre or gender. There are many more experts than we were able to include, and we are likely to have missed experts who could have provided valuable contributions. Our proposed definitions, while based on a content analysis of scoping reviews and an expert survey, are the outputs of one possible interpretation of the data and may not be universally accepted. We hope our analysis and findings move the conversation forwards, providing input about how to communicate and collaborate around these vitally important concepts, and ultimately how to improve the care and outcomes for critically ill patients.

CONCLUSION

The concepts critical illness and critical care lack consensus definitions and are used in varied ways in the literature and among global experts. Through a concept analysis of scoping reviews and an expert survey we identify common themes in the uses and understandings of the concepts. We propose definitions for the concepts: “Critical illness is a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility” and “Critical care is the identification, monitoring, and treatment of patients with critical illness through the initial and sustained support of vital organ functions.” The proposed definitions could aid clinical practice, research and policy-making.

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Supplementary Table 1 Literature with definitions of critical illness

	First Author and Publication Date	Country	Reference
1	Kievlan 2016	United States	Kievlan DR, Martin-Gill C, Kahn JM, Callaway CW, Yealy DM, Angus DC, et al. External validation of a prehospital risk score for critical illness. Crit Care. 2016;20(1):255.
2	Warttig 2018	United Kingdom	Warttig S, Alderson P, Evans DJW, Lewis SR, Kourbeti IS, Smith AF. Automated monitoring compared to standard care for the early detection of sepsis in critically ill patients (Review). Cochrane Database of Syst Rev. 2018(6):28.
3	Rodriguez 2018	United States	Rodriguez RM, Greenwood JC, Nuckton TJ, Darger B, Shofer FS, Troeger D, et al. Comparison of qSOFA with current emergency department tools for screening of patients with sepsis for critical illness. Emerg Med J. 2018;35(6):350-6.
4	Benneyworth 2015	United States	Benneyworth BD, Bennett WE, Carroll AE. Cross-sectional comparison of critically ill pediatric patients across hospitals with various levels of pediatric care. BMC Res Notes. 2015;8:693.
5	Hsu 2016	Taiwan	Hsu CW, Lin CS, Chen SJ, Lin SH, Lin CL, Kao CH. Risk of type 2 diabetes mellitus in patients with acute critical illness: a population-based cohort study. Intensive Care Med. 2016;42(1):38-45.
6	Painter 2013	United States	Painter JR. Critical Care in the Surgical Global Period. Chest. 2013;143(3):851-5.
7	Chandrashekar 2015	India	Chandrashekar M, Shivaraj BM, Krishna VP. A study on prognostic value of serum cortisol in determining the outcome in the critically ill patients. JEMDS. 2015;4(58):10130-5.
8	Liao 2014	United States	Liao MM, Lezotte D, Lowenstein SR, Howard K, Finley Z, Feng ZP, et al. Sensitivity of systemic inflammatory response syndrome for critical illness among ED patients. Am J of Emerg Med. 2014;32(11):1319-25.
9	Valentin 2011	23 countries	Valentin A, Ferdinande P, Improvem EWGQ. Recommendations on basic requirements for intensive care units: structural and organizational aspects. Intensive Care Med. 2011;37(10):1575-87.

Supplementary Table 2 Literature with definitions of critical care

	First Author and Publication Date	Country	Reference
1	Wunsch 2008	United States, France, UK, Canada, Belgium	Wunsch H, Angus DC, Harrison DA, Collange O, Fowler R, Hoste EA, et al. Variation in critical care services across North America and Western Europe. <i>Crit Care Med</i> . 2008;36(10):2787-93, e1-9
2	Prin 2012	United States	Prin M, Wunsch H. International comparisons of intensive care: informing outcomes and improving standards. <i>Curr Opin Crit Care</i> . 2012;18(6):700-6
3	Painter 2013	United States	Painter JR. Critical care in the surgical global period. <i>Chest</i> . 2013;143(3):851-5
4	Royal College of Anaesthetists 2018	England	https://www.rcoa.ac.uk/sites/default/files/documents/2020-06/EMC-Guidelines2018.pdf
5	Joint Faculty of Intensive Care Medicine of Ireland and Intensive Care Society of Ireland 2019	Ireland	https://jficmi.anaesthesia.ie/wp-content/uploads/2019/09/National-Standards-for-Adult-Critical-Services-2019.pdf
6	Marshall 2017	Many countries	Marshall JC, Bosco L, Adhikari NK, Connolly B, Diaz J v., Dorman T, et al. What is an intensive care unit? A report of the task force of the World Federation of Societies of Intensive and Critical Care Medicine. <i>Journal of Critical Care</i> . 2017 Feb;37:270–6.
7	The International Surgical Outcomes Study 2016	Many countries	International Surgical Outcomes Study g. Global patient outcomes after elective surgery: prospective cohort study in 27 low-, middle- and high-income countries. <i>Br J Anaesth</i> . 2016;117(5):601-9
8	Benneyworth 2015	United States	Benneyworth BD, Bennett WE, Carroll AE. Cross-sectional comparison of critically ill pediatric patients across hospitals with various levels of pediatric care. <i>BMC Res Notes</i> . 2015;8:693.
9	Kievlan 2016	United States	Kievlan DR, Martin-Gill C, Kahn JM, Callaway CW, Yealy DM, Angus DC, et al. External validation of a prehospital risk score for critical illness. <i>Crit Care</i> . 2016;20(1):255.
10	Boyle 2008	Australia	Boyle M, Butcher R, Conyers V, Kendrick T, MacNamara M, Lang S. Transition to intensive care nursing: establishing a starting point. <i>Aust Crit Care</i> . 2008;21(4):190-8.
11	Hirshon 2013	United States	Hirshon JM, Risko N, Calvillo EJ, Stewart de Ramirez S, Narayan M, Theodosios C, et al. Health systems and services: the role of acute care. <i>Bull World Health Organ</i> . 2013;91(5):386-8
12	McCarthy 2013	United States	McCarthy C, O'Rourke NC, Madison JM. Integrating advanced practice providers into medical critical care teams. <i>Chest</i> . 2013;143(3):847-50
13	Intensive Care Society 2009	United Kingdom	https://icmwk.com/wp-content/uploads/2014/02/Revised-Levels-of-Care-21-12-09.pdf