

## PEER REVIEW HISTORY

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### ARTICLE DETAILS

<b>TITLE (PROVISIONAL)</b>	Towards definitions of critical illness and critical care using concept analysis
<b>AUTHORS</b>	Kayambankadzanja,, Raphael; Schell, Carl; Gerdin Wörnberg, Martin; Tamras, Thomas; Mollazadegan, Hedi; Holmberg, Mats; Alvesson, Helle; Baker, Tim

### VERSION 1 – REVIEW

<b>REVIEWER</b>	Jason Widrich University of Florida College of Medicine, Anesthesiology
<b>REVIEW RETURNED</b>	25-Feb-2022

<b>GENERAL COMMENTS</b>	<p>This is an excellent idea and a noble concept. A clear concise definition with its defining attributes and components is important to standardize what future literature and studies appropriately should be classified under "critical illness" and "critical care"</p> <p>To actually have a definition of what is and what is not critical would lend to better research</p> <p>Although this was a wide literature review there are many more experts who could and should be polled for this topic. In addition there are dozens or highly reputable critical care societies that have spent considerable time and put out statements to define these terms.</p> <p>The definition of critical care proposed is useful, it is quite broad and covers most situations and rightfully points out that critical care does not automatically happen in an ICU. The definition of critical illness developed by this group does not cover many situations that would be considered as critical illness. Reversibility is not necessarily a requirement. In addition "the risk of further severe or even permanent organ dysfunction" is not part of the the definition of critical illness in this definition."</p> <p>This article is excellent as a survey as to what are the most common themes and terms used when we discuss critical care and critical illness. A frequency analysis of the themes or terms used would be helpful. For example if 90% of the publications and societies point out reversibility in their definitions that would strengthen your argument</p>
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<b>REVIEWER</b>	Holger A Lindner Heidelberg University
<b>REVIEW RETURNED</b>	03-Mar-2022

<b>GENERAL COMMENTS</b>	Kayambankadzanja et al. use scoping reviews and an expert survey
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	<p>to find out how the terms "critical illness" and "critical care" are defined, and they propose inclusive consensus definitions for both. Their approach is overall convincing, and the work is well described. Particularly, rate and absolute count of survey responses are impressive and, together with expert characteristics (Table 1), support the survey's representativeness. I have two comments:</p> <p>1) Lines 64-84: It is easy to see how lack of a clear definition hampers estimating the burden of critical illness. But can the authors illustrate better what problems arise in clinical practice and research by using examples.</p> <p>2) In my view, it would be of very high interest to introduce in more detail the etymology of the word "crisis" (as the root word for critical), including its Greek/Latin origins and ancient use to describe a medical condition at a turning point. It appears to me that the current meaning of "critical" as in critical illness/care is in fact very true to its original denotation. As such, the problem to define these terms may be less complicated than for instance with "sepsis", which is largely a clinical diagnosis at the bedside. In other words, I am not convinced that the term "critical" is as ambiguous in this context as possibly suggested by the authors. The authors should address the meaning of their findings in the light of etymology in the discussion.</p>
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<b>REVIEWER</b>	Mónica Vázquez-Calatayud Clínica Universidad de Navarra, Nursing Director
<b>REVIEW RETURNED</b>	11-Mar-2022

<b>GENERAL COMMENTS</b>	<p>Thank you for the opportunity to review this manuscript, which defines the concept of critical care. This conceptual clarity pretends to provide a general definition that is essential for practitioners and researchers to gain a comprehensive understanding. However, I have some suggestions related to the re-working of this paper so that it might better contribute to the goal of clarifying the use of the concept in the nursing literature.</p> <p><b>Introduction</b> In general, the introduction requires greater depth and weight by supporting each statement with evidence. It should be further clarified why it is necessary to carry out an analysis of the concepts, what their usefulness will be. In this sense, I consider it appropriate to focus on one of the two concepts and allude to the other in the borderline case section. Addressing both of them leads to a more superficial approach. The aim might be more carefully worded. Conceptual clarification relates to usefulness, which is not alluded to.</p> <p><b>Methods</b> In methods, it is required that you justify why the Walker &amp; Avant approach has been selected. In this section you mention six steps of this approach without explaining them and later, in the results section, you mention eight steps that have not been previously explained or mentioned. The process you have followed is not well followed. You carry out a scoping review but it is not described in sufficient detail to assess its rigor. It is recommended to incorporate the flow chart of the conceptual analysis study selection process could help. It would be good if you could also complete the supplementary tables with the study design, background, defining attributes, empirical referents and consequences of each of the selected articles. Table 1 describes the characteristics of the experts participating in</p>
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	<p>the survey, but it would be more enriching to show the results of the survey in a table. On the other hand, the results include codes and other information that could be explained in the methodology. As they present the methodology and the results, it is not clear how they have done the process.</p> <p><b>Results</b>  This section should include several sections: uses of the concept, defining attributes, cases, antecedents and consequences, empirical references and the proposed definition of the concept in detail and with a logical sequence. There are fragments of the results that pertain to methodology and it is very difficult for the reader to follow the reading.  In addition, it is not clear how the cases relate to the literature. I do not feel that the analysis, as written, is helpful in operationally or otherwise defining the concept as it is used in the nursing literature. An analysis based upon a broader scope of nursing literature, including examples of how these were derived from the literature, and with cases also more obviously derived from evidence in the literature, would more effectively illuminate this concept.</p> <p>The discussion lacks critical analysis and needs considerable development to move beyond a repetition of the results. The conclusions are rather bold in light of the dataset and should be more nuanced/tentative. The implications are broad, generic and unfounded.</p>
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**VERSION 1 – AUTHOR RESPONSE**

Reviewer 1 comments

This is an excellent idea and a noble concept. A clear concise definition with its defining attributes and components is important to standardize what future literature and studies appropriately should be classified under "critical illness" and "critical care"

To actually have a definition of what is and what is not critical would lend to better research. Although this was a wide literature review there are many more experts who could and should be polled for this topic. In addition there are dozens or highly reputable critical care societies that have spent considerable time and put out statements to define these terms.

Thank you.

We have clarified that we have included publications and grey literature from critical care societies in the review. We acknowledge that there are more experts than those we were able to include, and additional grey literature that we may have missed, and we have clarified this as a limitation in the discussion.

The definition of critical care proposed is useful, it is quite broad and covers most situations and rightfully points out that critical care does not automatically happen in an ICU. The definition of critical illness developed by this group does not cover many situations that would be considered as critical illness. Reversibility is not necessarily a requirement. In addition "the risk of further severe or even permanent organ dysfunction" is not part of the the definition of critical illness in this definition."

Thanks for this really interesting input! The proposed definitions are based on the concept analysis method using the scoping review and the expert survey. We have clarified in the discussion, that the definitions are provisional, are due to only one possible interpretation of the data and may not be universally accepted. Reversibility was a particularly interesting attribute with varied usage. The iterative content analysis method led us to include it in the definition, as we have written:

"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 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”

This article is excellent as a survey as to what are the most common themes and terms used when we discuss critical care and critical illness. A frequency analysis of the themes or terms used would be helpful. For example if 90% of the publications and societies point out reversibility in their definitions that would strengthen your argument

Thank you!

We have discussed this at length in the team. The definitions and usages of the concepts from the scoping reviews and the expert survey were charted and analysed using content analysis based on methods described by Erlingsson & Brysiewicz. In these methods, codes are only included once, repeated uses are not documented and the frequency of usage does not give greater weight. We think this is appropriate as the aim was to capture the full breadth of opinion rather than weigh usages according to frequency analyses.

Reviewer 2 comments Our response

Kayambankadzanja et al. use scoping reviews and an expert survey to find out how the terms "critical illness" and "critical care" are defined, and they propose inclusive consensus definitions for both. Their approach is overall convincing, and the work is well described. Particularly, rate and absolute count of survey responses are impressive and, together with expert characteristics (Table 1), support the survey's representativeness. I have two comments: Thank you!

1) Lines 64-84: It is easy to see how lack of a clear definition hampers estimating the burden of critical illness. But can the authors illustrate better what problems arise in clinical practice and research by using examples.

Thank you for this comment. Examples have now been added in the introduction.

2) In my view, it would be of very high interest to introduce in more detail the etymology of the word "crisis" (as the root word for critical), including its Greek/Latin origins and ancient use to describe a medical condition at a turning point. It appears to me that the current meaning of "critical" as in critical illness/care is in fact very true to its original denotation. As such, the problem to define these terms may be less complicated than for instance with "sepsis", which is largely a clinical diagnosis at the bedside. In other words, I am not convinced that the term "critical" is as ambiguous in this context as possibly suggested by the authors. The authors should address the meaning of their findings in the light of etymology in the discussion

Thank you for this really nice input! We have made changes and added the following section in the discussion:

“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 is the decisive point at which a patient either improves or deteriorates.(22) The concepts critical illness and critical care could be regarded as remaining true to these origins – 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 needed to direct the patient towards improvement rather than deterioration. “

Reviewer 3 comments Our response

Thank you for the opportunity to review this manuscript, which defines the concept of critical care. This conceptual clarity pretends to provide a general definition that is essential for practitioners and researchers to gain a comprehensive understanding. However, I have some suggestions related to

the re-working of this paper so that it might better contribute to the goal of clarifying the use of the concept in the nursing literature. Thank you

#### Introduction

In general, the introduction requires greater depth and weight by supporting each statement with evidence. It should be further clarified why it is necessary to carry out an analysis of the concepts, what their usefulness will be. In this sense, I consider it appropriate to focus on one of the two concepts and allude to the other in the borderline case section. Addressing both of them leads to a more superficial approach. The aim might be more carefully worded. Conceptual clarification relates to usefulness, which is not alluded to.

Thank you for your comments. We have modified the introduction. We have discussed the suggestion of focusing on one of the concepts at length in the team. We think that both the terms are really important and they fit together really well, so we would like to keep both in this paper.

#### Methods

In methods, it is required that you justify why the Walker & Avant approach has been selected. In this section you mention six steps of this approach without explaining them and later, in the results section, you mention eight steps that have not been previously explained or mentioned. The process you have followed is not well followed.

Thank you for your feedback.

We have expanded and explained the methods used.

You carry out a scoping review but it is not described in sufficient detail to assess its rigor. It is recommended to incorporate the flow chart of the conceptual analysis study selection process could help.

We have clarified the description of the scoping review methods and have added a flow-chart. It would be good if you could also complete the supplementary tables with the study design, background, defining attributes, empirical referents and consequences of each of the selected articles.

Thanks for this point. The articles included are not concept analysis articles themselves and so lack this information. We extracted the codes from the articles that concerned the definitions and uses of the concepts critical illness and critical care and included them in the analysis. We have clarified this in the methods.

Table 1 describes the characteristics of the experts participating in the survey, but it would be more enriching to show the results of the survey in a table. On the other hand, the results include codes and other information that could be explained in the methodology. As they present the methodology and the results, it is not clear how they have done the process.

Apologies that the process was not described in a clear manner. We have attempted to modify the methods text for clarification. The codes from the information in the survey and the scoping reviews are shown together in the content analysis in the results in Tables 2 and 3.

#### Results

This section should include several sections: uses of the concept, defining attributes, cases, antecedents and consequences, empirical references and the proposed definition of the concept in

detail and with a logical sequence. There are fragments of the results that pertain to methodology and it is very difficult for the reader to follow the reading.

Thank you for this comment. We have restructured and named the different sections appropriately for clarity.

In addition, it is not clear how the cases relate to the literature. I do not feel that the analysis, as written, is helpful in operationally or otherwise defining the concept as it is used in the nursing literature. An analysis based upon a broader scope of nursing literature, including examples of how these were derived from the literature, and with cases also more obviously derived from evidence in the literature, would more effectively illuminate this concept.

Thanks for this comment. To clarify: the cases are illustrating the concepts following the Walker and Avant methodology. The scoping review was broad and included all specialties and disciplines in line with the method. This has served as a ground for the codes, categories and themes presented in table 2, defining the concepts' attributes. As discussed in 'Strengths and Limitations', our proposed definitions may not be universally accepted or operational in all different contexts and paradigms related to the defined concepts.

The Discussion lacks critical analysis and needs considerable development to move beyond a repetition of the results.

Thank you for this comment. We have made some developments to the discussion and we think it provides critical discussion and interpretation of the results in the light of the literature and previous work. If there are specific additions that the reviewer would be keen to see, we would be happy to make further adjustments.

The conclusions are rather bold in light of the dataset and should be more nuanced/tentative. The implications are broad, generic and unfounded.

Thank you.

We have indicated in the discussion and conclusion that the definitions are possible definitions only.

#### **VERSION 2 – REVIEW**

<b>REVIEWER</b>	Holger A Lindner Heidelberg University
<b>REVIEW RETURNED</b>	08-Jul-2022

<b>GENERAL COMMENTS</b>	The authors have addressed both comments in a very convincing manner. I endorse their manuscript.
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<b>REVIEWER</b>	Mónica Vázquez-Calatayud Clínica Universidad de Navarra, Nursing Director
<b>REVIEW RETURNED</b>	05-Jul-2022

<b>GENERAL COMMENTS</b>	Dear authors,  The changes made by the authors in response to the suggestions made are gratefully acknowledged. A noticeable improvement has been noted in the methodology section. However, the introduction and discussion sections, as well as the conclusions, still need to be strengthened. There is a need to include more evidence to support some of the claims and to make the need for this study clearer. On the other hand, there is still a lack of critical analysis in the
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	discussion and vague statements in the conclusions. Hope these suggestions will help you to further refine the article.
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**VERSION 2 – AUTHOR RESPONSE**

<b>Reviewer 3</b>	
The changes made by the authors in response to the suggestions made are gratefully acknowledged. A noticeable improvement has been noted in the methodology section. However, the introduction and discussion sections, as well as the conclusions, still need to be strengthened. There is a need to include more evidence to support some of the claims and to make the need for this study clearer. On the other hand, there is still a lack of critical analysis in the discussion and vague statements in the conclusions.	Thank you for your kind words.  We have made additional improvements to the introduction, discussion and conclusion sections, including more text, more evidence and more references for clarity, to make the need for the study clearer and provide additional analysis.