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Instruments to measure postintensive care syndrome: a scoping review protocol

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ABSTRACT

Introduction There is an increasing need for evaluating postintensive care syndrome in adults concerning their long-term physical, psychological, cognitive and/or social outcomes, yet there is no consensus regarding the choice of instruments to measure these. This scoping review aims to identify and examine instruments used to measure postintensive care syndrome in adults.

Methods and analysis This scoping review will be conducted following the Arksey and O'Malley and its extended framework, and the Joanna Briggs Institute guideline. It will be reported according to the Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for Scoping Review checklists. Medline via EBSCO, CINAHL complete, EMBASE, Web of Science, AME and APA PsycINFO databases and grey literature will be searched from 2010 to the present. Reference lists of included studies will be manually checked to identify additional sources. The quality of included studies will be appraised using the Crowe Critical Appraisal Tool. All review steps will involve at least two reviewers. Data charting will be performed narratively, comprising study characteristics and findings, and instrument properties. This review will also aim to identify research gaps.

Ethics and dissemination There is no ethics disclosure for this review protocol. This scoping review will identify instruments used to measure postintensive care syndrome in adults. The findings will be disseminated through professional bodies, conferences and research papers.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This review will identify and examine instruments used to measure postintensive care syndrome in adults based on its theoretical framework.
⇒ The quality of individual studies will be appraised using the Crowe Critical Appraisal Tool.
⇒ This scoping review will follow the Arksey and O'Malley framework and its extension, and the Joanna Briggs Institute guidance.
⇒ Preferred Reporting Items for Systematic Reviews and Meta-analyses extension for Scoping Reviews checklists will be used to report the results and findings.
⇒ We will search the literature from 2010 to the present.

INTRODUCTION

Intensive care unit (ICU) usage and capacity have grown significantly over the past decade, largely due to an increasingly ageing population.[1] Virtually half of ICU admissions comprise older adults, and 60% of patients with sepsis in ICU are aged older than 65 years.[2] This is likely to be worsened in the current COVID-19 pandemic, it was reported that 20% of confirmed cases demand ICU care.[3] To accommodate higher demand, ICU capacity has surged internationally, generating an ever-increasing cohort of ICU admissions.[4–6] Nonetheless, owing to advances in ICU technology and care, the survival rate has increased considerably in ICUs[7–9] and the focus has shifted gradually to the long-term outcomes of survivors.[3 8–10] However, the effect of long-term complications after critical illness is overwhelming and multidimensional so ICU survivorship can have profound consequences. Potentially life-threatening illness, intensive and stressful treatments and illness experiences, and longer ICU stays have been associated with a variety of new or worsening long-term impairments in physical, psychological, cognitive and/or social functioning, which are collectively known as postintensive care syndrome (PICS),[8 11 12] which may persist for more than 5 years.[8 11–14]

Yuan *et al*, in a concept analysis, proposed PICS as a co-occurrence of these physical, psychological, cognitive and social impairments.[15] Around 50%–80% of admissions survive an ICU stay[8 16] and the prevalence of PICS can reach 80% of survivors.[8 9 17–19] Not only do individuals experience a deteriorated quality of life,[20] but health systems confront enormous challenges related to treatment, care and support for those with PICS.[3 21] Thus, detecting PICS among patients at risk and preventing them from deteriorating is a pressing matter, though it has been impeded by an absence of universally agreed PICS diagnostic criteria.[22 23] The Society of Critical Care Medicine[24] recommended a battery of

instruments (eight) to evaluate each domain of PICS. Spies *et al*[25] also proposed a set of PICS outcomes instruments (11), though these differ with regard to each domain.

To inform the evaluation of PICS in future studies, we aim to investigate the characteristics of existing instruments used to measure PICS in ICU adults. Considering the high heterogeneity of PICS instruments, a scoping review is a robust method to address this aim. A preliminary search of the Cochrane Database of Systematic Reviews and PubMed to identify whether scoping or systematic reviews had examined PICS instruments revealed two studies which differed from our focus: a scoping review of PICS instruments in the paediatric population[26] and a systematic review of prediction models for impairments after critical illness.[27]

METHODS AND ANALYSIS

Protocol

This protocol followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses Protocols (PRISMA) checklists and has been registered through Open Science Framework (Registration DOI: 10.17605/OSF.IO /G76PE).

Study design

Since type of instruments to measure PICS appeared to vary and their use appeared inconsistent,[24 25 28 29] a scoping review was deemed an appropriate method for our study aims as it maps the literature to address a broad question, identify primary sources and clarify concepts.[30 31] This scoping review will follow the framework of Arksey and O'Malley,[32] an extension to this[33] and the updated guidance of the Joanna Briggs Institute (JBI).[31] We will conduct the review in five key steps: (1) identifying the research question, (2) identifying relevant studies, (3) selecting the studies, (4) charting the data and (5) collating, summarising and reporting the results.[33] In addition, we will report the findings following the PRISMA extension for Scoping Reviews (PRISMA-ScR) checklists.[34]

The study team comprises a doctoral student with ICU nursing expertise, a specialist librarian and two professors of nursing.

Step 1: identifying the research question

We aim to identify existent PICS instruments and their characteristics, including domains measured, timing of administration, duration, validity and reliability. The research question is as follows: What existing instruments are used to measure PICS outcomes among ICU adults? Therefore, the objectives are (1) To investigate instruments available to measure PICS outcomes among adult patients, (2) To describe the characteristics of such instruments regarding domains (physical, psychological, cognitive and/or social) measured, mode and timing of administration, duration for completion, and their psychometric properties: validity and reliability, and (3) To identify research gaps and inform future research studies.

Step 2: identifying relevant studies

We will follow the Peer Review of Electronic Search Strategies (PRESS) guideline to formulate the search strategy in the following steps[35]: (1) Translation of the research question, (2) Boolean and proximity operator, (3) Subject headings (database-specific), (4) Text word search, (5) Spelling, syntax and line numbers and (6) Limits and filter. In addition, a specialist librarian and team members will peer-review the search strategy.

First, according to the research questions, we will divide the questions into three main concepts: ICU, PICS and instrument (table 1). PICS theoretical framework has four domains; 'physical', 'psychological', 'cognitive' and 'social'.

Second, we will expand key concepts by applying synonyms, wildcards and truncation. Simultaneously, we will employ the Boolean operator to combine the key search terms and MeSH in database searching. Following the PRESS guideline,[35] we piloted searched two online databases (Medline and Embase) to set up keywords and search string,[30] which will be used to guide the

Table 1 Search terms related to the three concepts

Concept	Search terms
ICU	ICU* OR ''intensive care*'' OR "critical care*" OR CCU* OR "acute care*'' OR "recovery room*''
PICS	"post-intensive care syndrome*" OR "post intensive care syndrome*" OR PICS "postintensive care syndrome" OR "post ICU syndrome*" OR "post-ICU syndrome*" OR "ICU delirium" OR "ICU-delirium" OR cognition OR neurocognitive OR cognitive OR memory OR "memory disorder" OR "executive function" OR attention OR language OR "physical health" OR mobility OR weakness OR "muscular weakness" OR "ICU-acquired weak*" OR "ICU acquired weak*" OR "post-ICU depression*" OR "post ICU depression*" OR "post-ICU anxiety" OR "post ICU anxiety" OR PTSD OR "post-traumatic stress disorder" OR "psychological health" OR "psychological disorder" OR "social health" OR "social participation"; "social relationships" OR "post-ICU consequence*" OR "post ICU consequence*" OR "post ICU outcome*" OR "post-ICU outcome*" OR "post ICU symptom*" OR "post-ICU symptom*"
Instrument	test OR tests OR scale* OR instrument* OR tool* OR measur* OR Question* OR Survey* OR Assess* OR Index OR Indices OR diagnos*

ICU, intensive care unit; PICS, postintensive care syndrome.

Table 2 Search results in Medline via EBSCO

#	Query	Results
S8	S3 AND S4 AND S7	2579
S7	S5 OR S6	9 987 735
S6	TI test OR tests OR scale* OR instrument* OR tool* OR measur* OR Question* OR Survey* OR Assess* OR Index OR Indices OR diagnos*	1 935 343
S5	AB test OR tests OR scale* OR instrument* OR tool* OR measur* OR Question* OR Survey* OR Assess* OR Index OR Indices OR diagnos*	9 267 844
S4	"post-intensive care syndrome*" OR "post intensive care syndrome*" OR PICS "postintensive care syndrome" OR "post ICU syndrome*" OR "post-ICU syndrome*" OR "ICU delirium" OR "ICU-delirium" OR cognition OR neurocognitive OR cognitive OR memory OR "memory disorder" OR "executive function" OR attention OR language OR "physical health" OR mobility OR weakness OR "muscular weakness" OR "ICU-acquired weak*" OR "ICU acquired weak*" OR "post-ICU depression*" OR "post ICU depression*" OR "post-ICU anxiety" OR "post ICU anxiety" OR ptsd OR "post-traumatic stress disorder" OR "psychological health" OR "psychological disorder" OR "social health" OR "social participation"; "social relationships" OR "post-ICU consequence*" OR "post ICU consequence*" OR "post ICU outcome*" OR "post-ICU outcome*" OR "post ICU symptom*" OR "post-ICU symptom*"	15,4631
S3	S1 OR S2	435 325
S2	ICU* OR ''intensive care*'' OR "critical care*" OR CCU* OR "acute care*" OR "recovery room*"	431 659
S1	(MH "Intensive Care Units+") OR (MH "Respiratory Care Units") OR (MH "Coronary Care Units") OR (MH "Critical Care+") OR (MH "Critical Care Nursing") OR (MH "Recovery Room") OR (MH "Burn Units")	131 777

full database search. The preliminary search results in Medline via EBSCO are shown in table 2.

The databases to be searched for this review include Medline via EBSCO, CINAHL complete, EMBASE, Web of Science, AME and APA PsycINFO. In addition, we will manually search reference lists of included studies for additional sources, and search grey literature from the following websites: ClinicalTrials.gov, the Health Services Delivery Research Programme of the National Institute for Health Research (http://www.netscc.ac.uk/hsdr/), NHS Evidence by the National Institute for Health and Clinical Excellence (http://evidence.nhs.uk/), Nursing and Allied Health Resource Section, NAHRS (http://sites.google.com/site/nahrsnursingresources) and Google (www.google.com). All citations will be imported to EndNote (V.20.1, Clarivate, Philadelphia, USA), where a solid duplicate procedure will be applied to remove duplicates.

Step 3: study selection

After duplication removal, all citations of the literature search will be entered into the Covidence (Veritas Health Innovation, Melbourne, VIC, Australia) primary screening and extraction tool. Two researchers will independently select the citations in three steps: (1) title and abstract screening; (2) full-text review and (3) extraction in Covidence. We will inform the creation of inclusion criteria in line with the Population (or Participants), Concept and Context framework of the JBI guideline[29] (table 3). At the title and abstract stage, the review will include ICU adult (≥18 years of age). Due to the concept of PICS having four domains, we will expand the criteria

Table 3 Inclusion and exclusion criteria

	Inclusion criteria	Exclusion criteria
Title and abstract level	Population: Adult patients aged ≥18 years of age Context: adult ICU settings, ICU patients discharged to hospital wards, recovery centres, rehabilitation, outpatient, home care, community care or other healthcare settings. Concepts: instruments measure PICS; instruments used to evaluate the frequency or incidence of PICS; studies aimed at developing or validating items for measuring PICS; instruments measure physical, psychological, cognitive, or social domains.	l Language: non-English. l Timeframe: from 2010 to present
Full-text level	Concept: studies included PICS instruments even if no primary data were collected	l No full text available (ie, conference abstract only) l No peer-reviewed published evidence l Not to mention any instruments

ICU, intensive care unit; PICS, postintensive care syndrome.

to a broad range of physical, psychological, cognitive and social domains. However, as PICS was initially introduced in 2010, we will restrict data from then until the present. In addition, we will include studies that examine PICS in all contexts, including ICUs, recovery centres, rehabilitation, outpatient, home care, community care, hospitals or other healthcare settings, without any restrictions on geography, culture, race or sex. As a result of insufficient funding and translation sources, we will not include non-English publications. At the full-text level, one researcher will contact corresponding authors to obtain full-text papers available if there is no full report online available. These abstracts will not be included if there is no peer-reviewed published evidence or author response. In addition, as the review aims to identify instruments, studies will be included regardless of data analysis taking place, but we will exclude studies without instrument usage.

The inclusion and exclusion criteria for each stage (table 3) will be prewritten into Covidence, and researchers blindly screen the citations based on it. In the first stage, the titles and abstracts will be independently screened by the two reviewers (YC and FT) against the inclusion criteria. If conflicts arise, articles will be entered into the full-text screening for further scrutiny. In the full-text screening stage, the selected citations will be screened by the same two reviewers (YC and FT). If there are disagreements during the selection process, a third reviewer (DT) will join in, and we will discuss and resolve them together. The inclusion/exclusion criteria will be agreed by the research team reaching a consensus. The results of the searches will be reported in full in the final scoping review and presented in a PRISMA-ScR flow diagram (figure 1). In addition, although it is optional, we will use the Crowe Critical Appraisal Tool (V.1.4)[36] to appraise the quality of included studies.

Steps 4: charting the data

The included studies will be extracted by one reviewer (YC) and cross-checked with a second reviewer (DT.) using Microsoft Word, according to the JBI data extraction template.[29] The objective of this scoping review is to identify the existing PICS instruments. We will include the following aspects: data on study characteristics such as country, year, authors, research design, methodology, context, study population and the studies' follow-up rates (if applicable); we will also extract information on instruments and their characteristics, including use, administration methods, time frame, collection duration, cut-off value of individual instrument (if applicable), validity and reliability. We piloted a small sample of articles among our team to test the appropriateness of the data charting form.

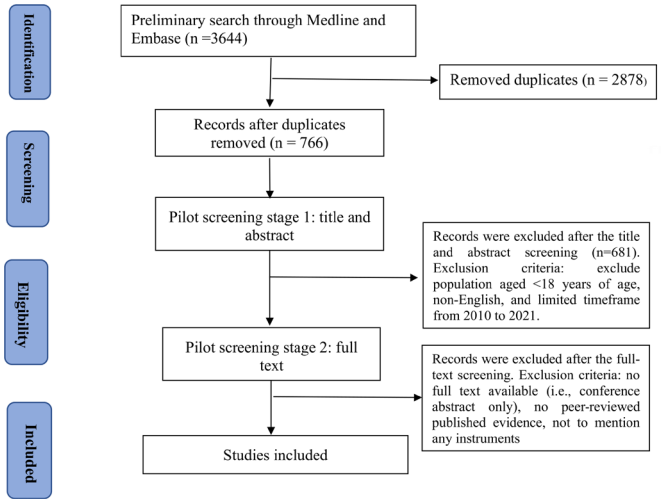

Figure 1 Flow chart for the selection process.

Step 5: collating, summarising and reporting the results

We will report the results using PRISMA-ScR checklists.[34] Three reviewers will check the reporting items (YC, FT and DT.) in case any are missing. In terms of data extraction on study characteristics, we will provide a tabulated overview, along with a narrative description, using percentages or proportions. In reporting data on instrument characteristics, we will also display this in a tabular format, where appropriate; the tables will be divided by the similarity and differences of the instruments. The assessment of study quality will be reported in the data collation part. The final aim of this review is to identify gaps in the research literature pertaining to instruments used to measure PICS. Limitations of this scoping review will also be reported.

Patient and public involvement

No patients involved in developing the scoping review design. We plan to disseminate results of the scoping review through the corresponding author's department social media.

Ethics and dissemination

Ethical approval is not required for this scoping review as the primary studies included in the review have been published. The authors aim to disseminate the findings from this scoping review through social media platforms, conference presentations and peer-reviewed publications.

CONCLUSION

This scoping review will synthesise and summarise the type and characteristics instruments used to measure PICS among ICU adult patients. It is envisaged this will serve to inform the use of such instruments by clinical practitioners and researchers, and help identify any research gaps.

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