

A systematic review finds limited data on measurement properties of instruments measuring outcomes in adult intensive care unit survivors

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Abstract

Background and Objective: There is a growing number of studies evaluating the physical, cognitive, mental health, and health-related quality of life (HRQOL) outcomes of adults surviving critical illness. However, there is little consensus on the most appropriate instruments to measure these outcomes. To inform the development of such consensus, we conducted a systematic review of the performance characteristics of instruments measuring physical, cognitive, mental health, and HRQOL outcomes in adult intensive care unit (ICU) survivors.

Methods: We searched PubMed, Embase, PsycInfo, Cumulative Index of Nursing and Allied Health Literature, and The Cochrane Library in March 2015. We also conducted manual searches of reference lists of eligible studies and relevant review articles. Two people independently selected studies, completed data abstraction, and assessed the quality of eligible studies using the COnsensus-based Standards for the selection of health Measurement Instruments (COSMIN) initiative checklist.

Results: We identified 20 studies which explicitly evaluated measurement properties for 21 different instruments assessing outcomes in ICU survivors. Eleven of the instruments assessed quality of life, with few instruments assessing other domains. Of the nine measurement properties evaluated on the COSMIN checklist, six were assessed in <10% of the evaluations. Overall quality of eligible studies was generally poor to fair based on the COSMIN checklist.

Conclusions: Although an increasing number of studies measure physical, cognitive, mental health, and HRQOL outcomes in adult ICU survivors, data on the measurement properties of such instruments are sparse and generally of poor to fair quality. Empirical analyses evaluating the performance of instruments in adult ICU survivors are needed to advance research in this field. © 2016 Elsevier Inc. All rights reserved.

Keywords: Outcome measures; Critical care survivors; Systematic review

1. Introduction

With the aging population leading to increased demand for critical care services, and with improving short-term

mortality in the intensive care unit (ICU), there is a growing number of survivors of critical illness [1,2]. Frequently such survivors experience significant challenges in their physical, cognitive, mental health, and quality of life (QOL) outcomes lasting long after hospital discharge [3]. Consequently, there is a growing number of studies evaluating postdischarge outcomes in adult ICU survivors.

More than 160 different outcome measures were identified in studies of adult ICU survivors in a 1998 systematic review [4,5]. This systematic review reported on the validity,

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What is new?

Key findings

- Our systematic review identified 20 studies evaluating measurement properties of 21 different instruments assessing outcomes in more than 8,500 adult survivors of critical illness.
- There were very few studies for each type or domain of outcome with the quality of the evaluations within eligible studies generally poor to fair.

What this adds to what was known?

- This work will help inform the development of a limited minimum set of outcome measures (core outcome set) to be used in all studies in this field; such core outcome sets are important to facilitate the synthesis of study results and maximize the ability of studies to inform practice.

What is the implication and what should change now?

- There was insufficient evidence to draw conclusions about the quality of the measurement properties of any of the instruments that measured physical, cognitive, mental health, or quality of life outcomes in adult survivors of critical illness.
- There is an urgent need for empirical analyses evaluating the measurement properties of instruments and performance-based tests in adult survivors of critical illness to advance research in this field; this research needs to include collaboration with those with expertise in assessing measurement properties.
- International efforts to develop core outcome measure sets demand rigorous examination of outcome measurement properties; future reviews will determine if these efforts will improve the field of instrument development.

reliability, and responsiveness of 38 instruments that had been used in at least two studies, but recommendations for selection of instruments were limited due to the poor quality of evidence. The great heterogeneity of measures and instruments led the authors to recommend the development of a limited set of outcome measures. A limited set of measures used in all future studies would improve comparability between studies and facilitate the synthesis of findings in this rapidly advancing field of research.

The heterogeneity of measures is not unique to critical care medicine. Across many fields of clinical research, there is growing interest in developing and adopting core

outcome sets. Such “core outcome sets” outline a minimum set of measures to be reported in all studies of a particular health condition [6]. A key step in developing core outcome sets is understanding the measurement properties of outcome measurement instruments being considered for inclusion.

Hence, to help inform consensus and the development of a core outcome set [7] for evaluating postdischarge physical, cognitive, mental health, and health-related quality of life (HRQOL) outcomes in adult survivors of critical illness [8], we conducted a systematic review of the measurement properties of instruments used in this population.

2. Methods

Our methods follow recommendations for conducting systematic reviews of measurement properties [9,10]. In March 2015, we searched MEDLINE (via PubMed), Embase, Cumulative Index of Nursing and Allied Health Literature, PsycInfo, and The Cochrane Library (all databases, including Central Register of Controlled Studies, and Methodology Studies Database). We sought studies that reported or evaluated the measurement properties of instruments assessing health outcomes in survivors of intensive care. The search strategies combined controlled vocabulary and text words for intensive care and health outcomes and were adapted from the strategy used in a prior related health technology assessment [5] (see Appendix at www.jclinepi.com). We also manually searched reference lists of eligible studies and relevant review articles identified by our search and by the Core Outcome Measures in Effectiveness Trials (COMET) initiative [11]. No limits were used for language, date, or study design during the search phase.

2.1. Selection of evidence

Two people independently screened search results. The predetermined criteria for excluding studies were as follows: (1) published before 1970, (2) non-English, (3) did not report the measurement properties of an instrument or test measuring physical, cognitive, mental health, or QOL outcome(s), (4) was not conducted in 20 or more adults (≥ 16 years) discharged from an ICU, or (5) only described instrument(s) that measured outcomes in-hospital (e.g., APACHE severity of illness score). We excluded studies before 1970 as we sought to focus on outcome measurement instruments currently in use, and there is little research on ICU survivors before 1970 [12]. We did not exclude studies based on type of health outcome assessed.

2.2. Data abstraction and assessment

Two people independently abstracted data including patient characteristics, sample size, timing of assessment, outcomes assessed, instruments used, and measurement properties of the instruments.

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