






## SCOPING REVIEW

# Patients' experiences of cognitive impairment following critical illness treated in an intensive care unit: A scoping review

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## Abstract

**Introduction:** Treatment with modern technology in an intensive care unit has increased critical illness survival. However, many patients are affected by their critical illness for months or years following discharge, as they experience cognitive impairments. Long-term cognitive impairments can severely affect patients' quality of life. Exploring patients' experiences on how and which cognitive impairments affect their everyday lives is important to improve planning of relevant research into interventions that may alleviate the burden of post-intensive cognitive impairments.

**Aim:** To review the literature on patients' experiences of cognitive impairment following critical illness treated in an intensive care unit.

**Methods:** A systematic search was conducted in PubMed, Cinahl, PsycInfo and Embase in March–May 2021. References and citations in relevant studies were explored. The Covidence tool was used by two independent researchers to identify relevant studies for inclusion. The Mixed Methods Appraisal Tool was used for critical appraisal. The JBI methodology for scoping reviews and the PRISMA-ScR checklist were used (Supporting Information File 1).

**Results:** We identified 11 relevant qualitative and/or quantitative studies. Four themes were found: 'Experiencing poor memory', 'Managing everyday life', 'Unsupported by the healthcare system' and 'Strategies for support in recovery'. Patients used various strategies during their recovery and rehabilitation to regain independence and avoid being a burden. They needed information to support their recovery and rehabilitation; otherwise, they felt unsupported and betrayed by the healthcare system.

**Conclusion:** Patients experienced various cognitive impairments following critical illness in the intensive care unit, affecting and challenging their quality of life and adaptation to everyday life.

**Relevance to clinical practice:** Knowledge gained by exploring patients' experience of cognitive impairments following critical illness in the intensive care unit can

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contribute to improve clinical practice by targeting and optimising patients' rehabilitation process.

**Patient or public contribution:** No patient or public involvement in this scoping review.

#### KEYWORDS

cognitive impairment, discharge, intensive care, patients' experience, recovery, rehabilitation

## 1 | INTRODUCTION

Survival from critical illness in the intensive care units (ICU) has increased due to the development in advanced technology and critical care medicine (Rawal et al., 2017). However, critical illness and ICU admission may affect patients for several months or years following discharge (Rousseau et al., 2021). Many patients experience mental, physical and cognitive impairments, also known as post-intensive care syndrome (PICS), which is defined as new or worsening multidimensional impairments following critical illness that persist beyond ICU discharge (Rawal et al., 2017). Patients' experience of cognitive impairments are probably the most frequent and under-recognised complication in survivors of critical illness (Muradov et al., 2021).

According to the Fundamentals of Care Framework (FOC) by Kitson (2018), establishing a positive nurse–patient relationship requires five elements; 'developing a relationship with the patient, focusing and giving the patient undivided attention, anticipating their needs, knowing enough about the patient to act appropriately and evaluating the quality of the relationship' (Kitson, 2018). The nurse–patient relationship is therefore challenged when patients experience cognitive impairments in the ICU. For this very reason, it is critical that nurses obtain knowledge about cognitive impairments and take patients' different cognitive impairments into consideration.

Cognitive impairments may affect one or more cognitive domains in intensive care survivors (Wergin & Modrykamien, 2012). According to the literature, cognitive impairments are often seen in domains such as memory, attention, executive function, mental processing, speed and visuo-spatial function (Needham et al., 2012). However, internationally there is not consensus about cognitive domains or about which screening tools and tests to use. Therefore, researchers find different prevalences. Nedergaard et al. (2017) have reported cognitive impairments with prevalence higher than 70% at discharge, 13%–79% at 3–6 months, 10%–79% at 1 year, 25%–47% at 2 years and approximately 25% at 6 years after discharge in intensive care survivors (Nedergaard et al., 2017).

Acute in-hospital stress symptoms due to the stressful environment in the ICU may increase cognitive impairments up to 12 months following the ICU discharge (Davydow et al., 2013). According to Fried et al. (2002), critically ill patients prioritise maintaining their cognitive functioning higher than mere survival when they are evaluating treatment preferences (Fried et al., 2002).

### What does this paper contribute to the wider global clinical community?

- This scoping review enables nurses and allied healthcare professionals to understand patients' and relatives' experience of cognitive impairments following ICU, which can contribute to planning and facilitating of clinical research and practice and to the rehabilitation process for patients and relatives.
- The majority of patients are experiencing cognitive impairments following critical illness, which are negatively affecting and challenging their QoL and everyday life.
- The findings in this scoping review show that patients' need information and strategies in order to recover from cognitive impairments following critical illness.

Delirium, also known as 'critical illness brain injury', is another aspect associated with a longer duration of cognitive impairments (Girard, 2018). Delirium affects more than 50% of patients during an ICU stay and may be the most important risk factor for long-term cognitive impairments following discharge (Girard et al., 2010; Pandharipande et al., 2013).

A paradigm shifts has occurred within the past decades in the ICUs in Denmark and Nordic countries and increased the focus on using less or even no sedation during critical illness, thus facilitating better and earlier communication and mobilisation (Egerod et al., 2013; Olsen et al., 2021). However, non-sedation in itself has not been found to affect cognitive function 3 months following ICU discharge, even though non-sedated patients were found to be less delirious (Nedergaard et al., 2020).

Long-term cognitive impairments not only affect patients' quality of life (QoL) and their adjustment to everyday life (Granja et al., 2012); but also reduction in employment due to cognitive impairments following critical illness are found regardless of delirium in the ICU or not (Norman et al., 2016). Relatives, friends and colleagues may be affected as well, and left without information and lack of skills helping them to manage patients' needs following ICU discharge (Choi et al., 2018). Critical illness in ICU survivors and their rehabilitation is associated with a huge burden for patients and relatives, and a considerable increase in the overall healthcare costs (Granja et al., 2012).

Extensive research exists concerning the psychological and physical impairments following critical illness, and a relatively large amount of research has investigated cognitive impairments as well. However, literature exploring how patients experience cognitive impairment following critical illness is quite sparse (Rawal et al., 2017), and has to our knowledge not yet been summarised.

A preliminary search of MEDLINE (PubMed), Cinahl, Embase, PsycInfo and the JBI Database (of Systematic Reviews and Implementation Reports) was carried out to avoid evidence duplication (Peters et al., 2020). No current or ongoing scoping reviews or systematic reviews concerning patients' experiences of cognitive impairments following critical illness were found. Reviews focusing on interventions to decrease cognitive impairments and develop preventive strategies have been performed, although they conclude that more effort should be devoted to producing evidence on recovery from cognitive impairments (Nedergaard et al., 2017).

Exploring patients' experiences on how and which cognitive impairments are affecting their everyday lives is important to facilitate planning of relevant research into interventions that may alleviate the burden of post-ICU cognitive impairments. Likewise, it is important to change the nurses' approach in caring for these patients.

## 2 | AIM

This scoping review aimed to review the literature on patients' experiences of cognitive impairment following critical illness treated in an intensive care unit.

## 3 | METHOD

### 3.1 | Design

The protocol for this scoping review has been published (Alrø et al., 2022). The scoping review was conducted in accordance with the framework proposed by the Joanna Briggs Institute for Scoping Reviews (Peters et al., 2020). The framework comprises the following steps: identifying the research question, identifying relevant studies, study selection, charting data and collating, summarising and reporting the results. It was decided that the scoping review method should include various study methodologies and perspectives on how patients experience cognitive impairment following critical illness in the ICU. The aim and research questions were based on the PCC elements (Population, Concept and Context) (Supporting Information File 2) of the inclusion criteria (Peters et al., 2020; Tricco et al., 2018). Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review (PRISMA-ScR) guided by Tricco et al. (2018) was used as a checklist to secure a rigorous methodological approach (Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review (Supporting Information File 1)).

### 3.2 | Search strategy

The search strategy recommended by the JBI was used throughout the steps (Peters et al., 2020). An initial database search (PubMed and CINAHL) was undertaken by the first author (ABA) to identify the keywords and index terms contained in titles and abstracts. Subsequently, a systematic search was performed in April 2021 using the databases MEDLINE via PubMed, Cumulative Index to Nursing and Allied Health via CINAHL, PsycINFO via EBSCO and Embase via Elsevier. All keywords and index terms were applied across all included databases. All the different descriptions of 'cognitive impairment' were included in the systematic search. The systematic search was qualified by a research librarian who optimised the search design while refining and validating the search. Furthermore, a forward and backward citation search was made, and the References sections of the included articles were searched for additional articles (Peters et al., 2020).

The included key terms were based on PCC and comprised the MeSH/Subheadings/Thesaurus/Emtree index terms: (Population) 'cognitive impairments', 'cognitive deficits', 'cognitive dysfunction', 'cognitive function', 'cognitive defect', 'cognitive disorders', 'postintensive care syndrome', 'PICS', 'postintensive care unit syndrome', 'post intensive care syndrome' and 'post ICU syndrome', (Concept) 'patients experience', 'psychology[tiab]', 'perceived', 'perception', 'perspective', 'thoughts', 'opinion', 'stress, psychological', 'patient satisfaction', (Context) 'ICU[tiab]', 'intensive care units', 'intensive care unit\*'. Furthermore, a free text search was performed. All key terms were combined using the Boolean operators AND/OR (Supporting Information File 2).

### 3.3 | Inclusion and exclusion criteria

The scoping review considered peer-reviewed original studies within qualitative, quantitative and mixed methods study designs for inclusion. We included studies that described critically ill adult male and female patients  $\geq 18$  years admitted to a general ICU  $> 24$  h (Population), and described or mentioned such patients' experiences of cognitive impairment following critical illness in the ICU within a five-year time frame after discharge (Context). Articles published in English and the Scandinavian languages were included. We excluded literature reviews and studies exploring patients' cognitive function following critical illness exclusively on the basis of quantitative questionnaire data.

### 3.4 | Quality appraisal

This scoping review used the Mixed Methods Appraisal Tool (MMAT) for quality appraisal (Table 1). MMAT consists of two screening questions for all types of studies: 'Are there clear research questions?' and 'Do the collected data allow the research question to be addressed?' The MMAT also includes five additional questions

TABLE 1 Extraction of eligible studies ( $n = 11$ )

Authors (year)	Aim	Number of participants	Study population	Origin/setting	Methods/ methodology	Main results/findings	Authors' conclusion	Summary of critical appraisal
Fonsmark and Rosendahl-Nielsen (2015)	To describe and evaluate the knowledge gained from our three-year ICU outpatient follow-up	304 patients, 101 attended the Outpatient Clinic $\geq 2$ month after discharge	Adult ICU patients $>4$ LOS in ICU and $>10$ LOS in hospital	ICU 4131, Rigshospitalet, Denmark	A follow programme with information pamphlet, follow-up consultation and HADS questionnaire	Approx. half of the patients from the outpatient clinic described recent cognitive problems including difficulty with concentration, reading/ understanding and/or loss of memory	ICU survivors suffer considerable long-term physical and neuro-psychological sequelae. ICU follow-up may address these problems	Moderate quality
Maley et al. (2016)	To examine the association between resilience and neuropsychological and physical function and to contextualise these findings within the survivors' recovery experience	159 patients, 6–12 month after discharge, 43 completed interviews	Adult ICU survivors $\geq 2$ LOS in ICU	Two medical ICUs, Pennsylvania and Penn Presbyterian Medical Center, USA	Mixed-methods pilot: qualitative interviews and quantitative telephone battery test/questionnaires or Health Utilities Index cognitive questions	56% reported some degree of memory problems or difficulty with thinking clearly or solving problems	Resilience was inversely correlated with neuro-psychological impairment	Moderate/good quality
Ewens et al. (2018)	To investigate stories of recovery through the lens of ICU survivors	18 patients/6 completed the study	Adult ICU survivors, ICU LOS 3–21 days	General ICU in metropolitan, Western Australia	Qualitative interpretive biographical approach	Patients' lives had irreparably changed and felt unsupported by the healthcare system that had saved them	Participants' considered creating their stories supported their recovery process and enabled them to reflect on their progress	Good quality
Kang and Jeong (2018)	To explore critical care survivors' experience of post-intensive care syndrome	13 patients	Adult ICU survivors $>2$ LOS in ICU	4 university hospitals, South Korea	Qualitative one-to-one in-depth interviews and grounded theory design	Patients became physically, psychologically, cognitively and socially vulnerable after ICU discharge. They strived to overcome their vulnerability using variety of strategies	Mobilising internal resources and external support, including families, in the recovery process, is important. Recovery programme should be multi-dimensional	Good quality

TABLE 1 (Continued)

Authors (year)	Aim	Number of participants	Study population	Origin/setting	Methods/ methodology	Main results/findings	Authors' conclusion	Summary of critical appraisal
König et al. (2019)	To identify important HRQL domains for sepsis survivors	15 patients	Adults ICU patients, 6–36 month post ICU discharge	University hospital, Germany	Qualitative open-ended interviews, telephone or face-to-face	11 domains: psychological impairment, fatigue, physical impairment, coping with daily life, return to normal living, ability to walk, cognitive impairment, self-perception, control over one's life, family support and delivery of health care. Sepsis survivors want a 'normal life', to walk again, to regain control without cognitive impairment	Many HRQL domains which are not captured by the QoL instruments that have traditionally been used to study ICU survivorship	Good quality
Nelliot et al. (2019)	To investigate standardised outcome measures (patient-reported physical and mental health measures, and cognitive testing) compared with findings from semi-structured interviews	59 patients, 48 completed	Adult patients 6–12 month after ICU discharge	20 hospitals, USA	Qualitative semistructured interviews after completing patient outcome measures as part of either; the ALTOS or ROMA-ARF study	There were significantly worse scores on standardised outcome measures for survivors reporting (vs. not reporting) physical and mental health impairments in their qualitative interviews. Standardised cognitive test scores did not differ between patients reporting vs. not reporting cognitive impairments	Support the use of recommended, commonly used standardised outcome measures for physical and mental health impairments in ARF survivorship research	Good quality

(Continues)

TABLE 1 (Continued)

Authors (year)	Aim	Number of participants	Study population	Origin/setting	Methods/ methodology	Main results/findings	Authors' conclusion	Summary of critical appraisal
Elliott et al. (2019)	To test the feasibility of a study protocol designed to ascertain the incidence and impact of cognitive impairment during the recovery from critical illness	20 patients	Adult patients 3 months after ICU discharge	ICU, Australia,	Mixed-methods longitudinal pilot study, using a prospective cohort design with semistructured interviews	Pre-illness patients were not cognitively impaired; one patient had delirium in ICU. The proportion of patients with CI ranged from 80% (17/18) while in hospital to 35% (5/14) at 6 months	A significant proportion of patients had mild CI, largely confined to recall, and language and cognitive domains; quantitative findings were supported by interview findings	Good quality
Thurston et al. (2020)	To explore perspectives of adult critical illness survivors and identify important aspects to care and recovery	35 patients	Adult patients 6 months after ICU discharge	A Region hospital, Victoria, Australia	Qualitative semistructured interviews	Care experiences varied across recovery states, including care encounters, communication, support and impact on family and friends, and use of community health services	Framing their recovery in terms of recovery status and care experience, reflecting existing qualitative domains of physical health, psychological health, cognitive function, social health and life satisfaction	Good quality
Calkins et al. (2021)	To understand barriers and facilitators of recovery for critical illness survivors, who are discharged home from the hospital and do not have access to dedicated outpatient care	43 patients, 18 were included	Adult patients ≥3 days, 2–4 weeks after discharge	6 ICUs in 4 hospitals, USA	Qualitative multi-site descriptive study using semistructured interviews	Seeking support from family and friends, lifestyle adaptations, and creative management of their multiple medical needs. Barriers included unmet needs experienced by survivors such as mental health issues, coordination of care, and spiritual needs	Barriers and facilitators experienced during recovery that need to be addressed by healthcare providers. New ways to support survivors, that can reach a broader population, must be developed and evaluated to support them during their recovery	Good quality

TABLE 1 (Continued)

Authors (year)	Aim	Number of participants	Study population	Origin/setting	Methods/ methodology	Main results/findings	Authors' conclusion	Summary of critical appraisal
Aurjemma et al. (2021)	To determine aspects of care that patients and families valued during their ICU encounter, outcomes that patients and families prioritised after hospital discharge, and outcomes perceived as equivalent to or worse than death	102 patients, 49 were included	Adult patients LOS ≥ 4 ICU days	ICU, USA	Qualitative semistructured interviews	Processes of care within the ICU-communication, patient comfort, and a sense that the medical team was 'doing everything', patient and surrogate outcomes after the ICU, QoL, physical function, and cognitive function. Several outcomes were deemed worse than death, for example severe cognitive/physical disability	Simple measures of mortality rates may not represent patient- or family-centred outcomes in evaluations of ICU-based interventions, and new measures that incorporate functional outcomes and patients' and family members' views of life quality are necessary to promote patient-centred, evidence-based care	Good quality
Malmgren et al. (2021)	To construct a provisional questionnaire on health-related issues based on interviews with ICU survivors and to test if this questionnaire was able to show differences between ICU survivors and a control group	32 patients for interviews, 395 completed questionnaires	Adult patients LOS ≥ 3 ICU days; visited the clinic min. 6 month post discharge	ICU, Sweden	Qualitative interviews and development of provisional questionnaire	Analysis of the interviews yielded 238 questions in 13 domains, for example cognition, fatigue. In the second part, 395 of 518 ICU survivors and 197 of 231 controls returned a completed questionnaire. The two groups differed significantly in 13 of 22 comorbidities. ICU survivors differed in a majority of questions ( $p \leq .05$ ) distributed over all 13 domains compared with controls	The study describes the development of a provisional questionnaire to identify health-related quality of life issues and long-term burden of disease after intensive care. The questionnaire was answered by 395 ICU survivors. The questionnaire could identify that they experience severe difficulties in a wide range of domains compared with a control group	Good quality

Abbreviations: ARF, acute respiratory failure; CI, cognitive impairment; HRQL, health-related quality of life; ICU, Intensive care unit; LOS, length of stay; MV, mechanical ventilation; PICS, post intensive care syndrome; QoL, quality of life.

addressing study design categories. Using MMAT for the inclusion of eligible studies conducted by two independent researchers (ABA and HKN) contributed to appraising the methodological quality and rigour of the studies (Hong et al., 2018) (Supporting Information File 3).

### 3.5 | Data extraction and analysis

Data were extracted from studies included in the scoping review by two independent researchers (ABA and HKN). The retrieved studies from the systematic search were imported into the web-based reference programme Covidence after duplicates had been removed. The process was as follows; initial independent screening focusing on titles and abstracts; then full-text reading of the remaining unresolved studies followed by a common discussion based on the aim and inclusion criteria; finally, two studies were conferred with a third researcher (HS) both were accepted for inclusion.

The studies included in this scoping review were discussed, critically reviewed and critically assessed (MMAT) by two researchers (ABA and HKN) before the analytical process was initiated (Hong et al., 2018). The description and mention of patients' experiences of cognitive impairment following critical illness in the ICU were charted and extracted, and subsequently categorised through a

thematic analysis as described by JBI (Peters et al., 2020) within four themes in the Findings section. The software programme NVivo 12.0 (QSR International Pty Ltd., Victoria, Australia) was used for analysis of the extracted data.

## 4 | FINDINGS

In total,  $n = 3721$  studies were identified during the systematic search after duplicates had been removed. By screening the titles and abstracts,  $n = 3657$  studies were excluded in accordance with the inclusion and exclusion criteria. A total of  $n = 64$  studies were full-text assessed for eligibility among which  $n = 53$  studies were excluded because their study design and/or outcomes failed to meet the inclusion criteria. We included  $n = 11$  studies following critical appraisal, as represented in the PRISMA flow diagram (Figure 1). The included studies were summarised. The most relevant items of information from the studies are presented in Table 1. The included studies originated from Scandinavia (Fonsmark & Rosendahl-Nielsen, 2015; Malmgren et al., 2021), Germany (König et al., 2019), USA (Auriemma et al., 2021; Calkins et al., 2021; Maley et al., 2016; Nelliot et al., 2019), Australia (Ewens et al., 2018) and South Korea (Kang & Jeong, 2018) and were published between 2015 and 2021. The studies represented various methods, designs and

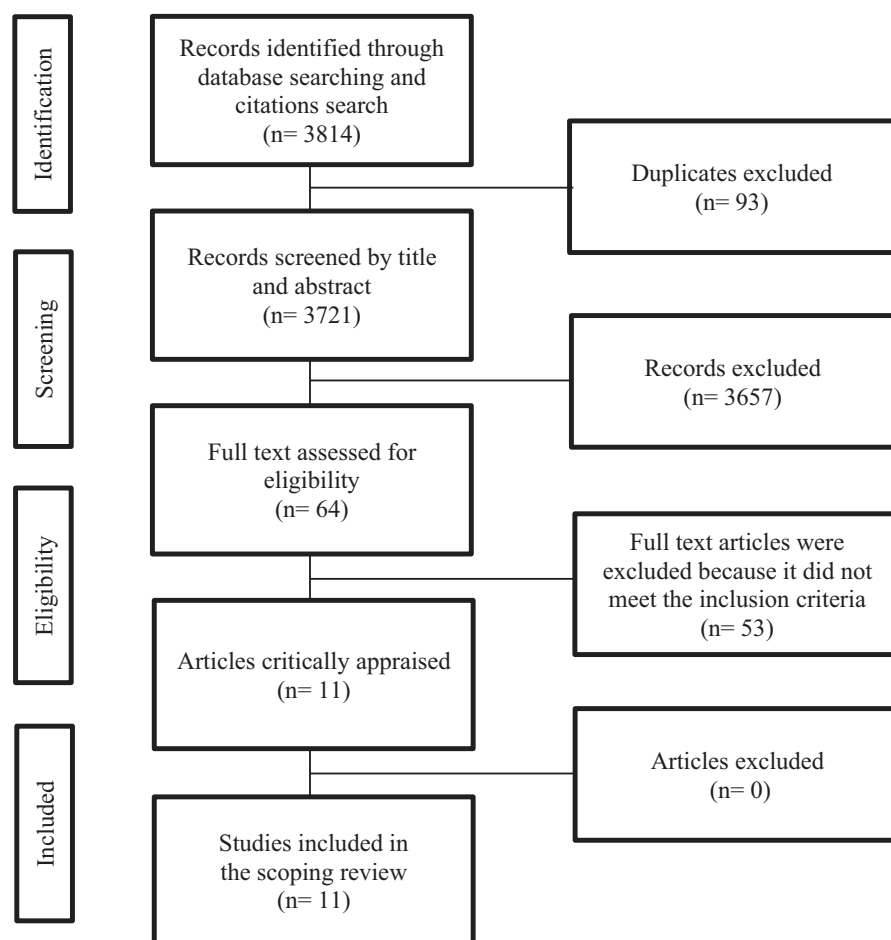


FIGURE 1 Selection process presented in a PRISMA flow diagram.



methodologies. Six studies had a qualitative design using different interview techniques (Calkins et al., 2021; Ewens et al., 2018; Kang & Jeong, 2018; König et al., 2019; Nelliot et al., 2019; Thurston et al., 2020); one had a quantitative design (Fonsmark & Rosendahl-Nielsen, 2015), and four studies had a mixed methods design based on qualitative interviews and quantitative questionnaires and/or tests such as the Health Utilities Index-3 cognitive questions, cognitive memory scores, cognitive outcome measures, the Montreal Cognitive Assessment Instrument, the Hospital Anxiety and Depression Scale (HADS) and the European Organisation for Research and Treatment of Cancer (EORTC) instrument (Elliott et al., 2019; Maley et al., 2016; Malmgren et al., 2021). Overall, the studies were rated to be of good quality, and a few were rated to be of moderate quality based on the MMAT quality appraisal criteria (Supporting Information File 3) (Hong et al., 2018).

Analysis of the contents revealed four themes that were concerned with patients' experiences of cognitive impairment following critical illness and ICU admission: 'Experiencing poor memory', 'Managing everyday life', 'Unsupported by the healthcare system' and 'Strategies for support in recovery' (Table 2).

#### 4.1 | Experiencing poor memory

Several studies found that it was common for patients to experience cognitive impairment following critical illness in the ICU, especially impairments in memory were highlighted (Calkins et al., 2021; Fonsmark & Rosendahl-Nielsen, 2015; Kang & Jeong, 2018; Maley et al., 2016; Nelliot et al., 2019; Thurston et al., 2020). Patients described their memory difficulties during their recovery as: 'Memory ... is not all that good. No, some things I remember and some things I don't, and that's kind of scary (...)' (Calkins et al., 2021). In the study by Malmgren et al. (2021), patients and controls answered 31 questions on areas related to cognitive function following critical illness and ICU admission (Malmgren et al., 2021). The five questions where ICU patients differed most from controls (= were more impaired) were: 'losing the thread easily', 'memory/thinking difficulties affecting QoL', 'difficulties taking initiatives', 'mistaken day of the week' and 'difficulties thinking clearly' (Malmgren et al., 2021). A patient described: 'I can't remember where I put things; sometimes I can't remember my children's birthdays' (Nelliot et al., 2019). Following critical illness in the ICU, 67% of patients reported impairment of their immediate memory, 66% reported impairment of delayed memory and 67% reported impairment of attention/working memory (Nelliot et al., 2019).

Cognitive impairment in the form of poor memory and forgetfulness was also perceived following critical illness and ICU admission (Calkins et al., 2021; Maley et al., 2016). A patient described short-time memory as 'The strange thing is because my memory's gone, so has my ability to spell words. So, I can't even understand my own writing or my own words' (Thurston et al., 2020). The study by Maley et al. (2016) showed that cognitive impairment was defined as present if the patient self-reported being 'somewhat forgetful' or worse

or reported having more than 'a little difficulty' in his or her ability to think and solve day-to-day problems. A total of 56% patients reported some degree of memory problems or difficulty thinking clearly or solving problems. Concerning memory, 35% were 'somewhat forgetful', 19% were 'very forgetful' and 2% were 'unable to remember anything at all'. Concerning executive dysfunction: 19% of the patients were 'having a little difficulty' thinking clearly and solving problems, and 19% were 'having a great deal of difficulty' following critical illness in the ICU (Maley et al., 2016). Patients described difficulties thinking as: 'I'd start getting a bit brain foggy ... you can feel that fatigue that you get in your brain that you then find it hard to think ... you know because you're dealing with money and all that sort of stuff' (Thurston et al., 2020).

The study by Nelliot et al. (2019) found that cognitive test scores for immediate and long-term memory as well as attention/working memory did not differ significantly for ICU patients who reported versus those who did not report memory impairment during qualitative interviews. The authors stated that 'many patients had memory impairment compared with matched population norms', without providing further data (Nelliot et al., 2019).

#### 4.2 | Managing everyday life

Patients also emphasised other cognitive impairments such as difficulties concentrating, maintaining attention, reading, understanding and also speech disturbances and disorientation following critical illness in the ICU (Fonsmark & Rosendahl-Nielsen, 2015; König et al., 2019). In the study by Fonsmark and Rosendahl-Nielsen (2015), patients (approx. 50%) described these impairments as 'recent' when they attended the outpatient clinic a minimum of two months after their ICU discharge. Patients described the loss of concentration as: 'I can't concentrate anymore. I read a lot, mostly detective stories. But it doesn't work. I read three pages and then I have to put the book aside' (König et al., 2019). In general, cognitive impairment following critical illness in the ICU was found to affect patients' everyday life in a variety of ways (Calkins et al., 2021; Ewens et al., 2018; Nelliot et al., 2019; Thurston et al., 2020). Patients felt that their lives had changed irremediably: 'I couldn't do what I could normally do'. Another patient noted: 'Absolutely, absolutely. I was thinking that maybe I should see a psychologist ... so they can fix me up and just stop' (Ewens et al., 2018).

All the issues with memory following critical illness in the ICU, including loss of short-term and long-term memory, struggling to recall information and difficulty managing daily tasks affected patients' everyday life (Calkins et al., 2021). A large proportion of the patients reported that their memory (46%) and ability to think or solve day-to-day problems (50%) were poorer after their critical illness and that this affected their everyday life (Maley et al., 2016). Patients described '(...) Just remembering daily things, remembering life, remembering my telephone number, remembering what I need to do that day or get the phone or how to work the phone, just little

**TABLE 2** Extracted qualitative and quantitative data

Themes	Summary of the theme	Qualitative outcomes	Quantitative outcomes
Experiencing poor memory	<p>Patients experienced impairments in memory following critical illness in the ICU.</p> <p>Patients experienced short- and long-term memory loss, losing the thread easily, being forgetful, difficulties in taking initiatives, executive function, thinking clearly, concentration, and attention.</p>	<p>Patients' described cognitive problems as loss in memory (Fonsmark &amp; Rosendahl-Nielsen, 2015). Cognitive impairment was defined as present if the survivor self-reported being 'somewhat forgetful' or worse or having more than 'a little difficulty' in his or her ability to think and solve day-to-day problems (Maley et al., 2016). It's my short term I'm really worried about because you know, for me to make my way, and this is a really big house. And to make my way into any of the rooms I get there and I'm like, what was I getting' (Nelliot et al., 2019).</p> <p>Some patients recognised difficulties with cognition–memory impairment, with one mentioning: 'I cannot remember where I put something down at, sometimes I cannot remember my children's birthdays' (Nelliot et al., 2019).</p> <p>'The strange thing is, because my memory's gone, so has my ability to spell words. So, I cannot even understand my own writing or my own words' (Thurston et al., 2020).</p> <p>Patients experience of their cognitive function: 'I'd start getting a bit brain foggy ... you can feel that fatigue that you get in your brain that you then find it hard to think ... you know, because you are dealing with money and all that sort of stuff' (Thurston et al., 2020).</p> <p>Cognitive difficulties affecting quality of life such as losing the thread easily, think you have done something you have not, mistaken which day of the week it is, or difficulties taking initiatives (Malmgren et al., 2021).</p> <p>Patients are describing cognitive impairments as poor memory and forgetful (Calkins et al., 2021).</p> <p>'Memory ... is not all that good. No, some things I remember and some things I do not, and that's kind of scary (...) (Calkins et al., 2021).</p>	<p>Cognitive test scores for immediate and long-term memory, and attention/working memory, did not differ for individuals who reported (vs. did not report) memory impairment during qualitative interviews.</p> <p>'Many patients had memory impairment compared with matched population norms' without further data (Nelliot et al., 2019).</p> <p>67% patients reported immediate memory, 66% reported delayed memory and 67% reported attention/working memory (Nelliot et al., 2019).</p> <p>Patients and controls answered 31 questions on areas of cognitive function. The five where ICU-survivors differed most (= were most impaired) from controls were: Losing the thread easily, memory/thinking, difficulties affecting QoL. Difficult taking initiatives and thinking clearly. Mistaken which day of the week (Malmgren et al., 2021).</p>
Managing everyday life	<p>Patients experienced that their cognitive impairments following critical illness in the ICU were affecting their everyday life and quality of life.</p> <p>Patients felt that their lives had irremediably changed and managing and adopting to everyday- social- and work life became challenging.</p>	<p>Patients described recent cognitive problems including difficulty with executive function, attention, concentration, reading/understanding (Fonsmark &amp; Rosendahl-Nielsen, 2015).</p> <p>'I could not do what I could normally do' and another patient said: 'Absolutely, absolutely. I was thinking about whether to see a psychologist ... so they can fix me up and just stop' (Ewens et al., 2018).</p> <p>'I get easily tired. I can only do one thing a day. If I had two appointments, I could not make it because I would be exhausted even before I finished the first one. I cannot move as much as I did before ... I feel so close to memory a long time ago; but, I cannot remember what happened just yesterday ... Now I feel a bit timid and passive compared to the past ... When I go outside, I feel like I cannot go well' (Kang &amp; Jeong, 2018).</p> <p>Most patients were experiencing a combination of physical, mental, cognitive and social problems, which were related to and affecting each other (Kang &amp; Jeong, 2018).</p> <p>Many survivors suffer from cognitive deficits. Main symptoms are lack of concentration, loss of memory, speech disturbance and disorientation (König et al., 2019).</p> <p>'I cannot concentrate anymore. I read a lot, mostly detective stories. But it does not work. I read three pages and then I have to put the book aside' (König et al., 2019).</p> <p>'It is not there anymore and takes me a while to try and remember and that makes it very difficult to interact with people at a level that cannot even possibly bring any enjoyment to myself or to them' (Nelliot et al., 2019).</p> <p>A patient said: 'I cannot work ... cannot organise things that I need. And that includes all those things that I just cannot' concentrate sufficiently on. That I regularly used to be able to ... paying bills and all those sort of things I really struggle with now' (Thurston et al., 2020).</p> <p>Patients cognitive impairment were described by several patients, resulting in reduced confidence and reluctance to return to previous activities (Thurston et al., 2020).</p> <p>Some patients connected physical function and cognition to quality of life (Auriemma et al., 2021).</p> <p>Patients experienced issues with their memory post critical illness including loss of short-term and long-term memory, struggling to recall information and difficulty managing daily tasks (Calkins et al., 2021).</p> <p>'Just remembering daily things, remembering life, remembering my telephone number, remembering what I need to do that day or get the phone or how to work the phone, just little bit things' (Calkins et al., 2021).</p>	<p>Cognitive problems were found in approximately half of the patients (Fonsmark &amp; Rosendahl-Nielsen, 2015).</p> <p>56% patients reported some degree of memory problems or difficulty with thinking clearly or solving problems. Concerning memory, 35% were 'Somewhat forgetful', 19% were 'Very forgetful', and 2% were 'Unable to remember anything at all'. Concerning executive dysfunction: 19% were 'Having a little difficulty' thinking clearly and solving problems, 19% were 'Having a great deal of difficulty' (Maley et al., 2016).</p> <p>46% and 50% of survivors reported that their memory or ability to think or solve day-to-day problems were worse after critical illness, respectively (Maley et al., 2016).</p>

TABLE 2 (Continued)

Themes	Summary of the theme	Qualitative outcomes	Quantitative outcomes
Unsupported by the healthcare system	<p>Patients felt unsupported and betrayed by the healthcare system although they had saved them.</p> <p>Patients felt vulnerably after discharge struggling with cognitive impairments. Patients needed information about the illness, discharge and recovery.</p>	<p>A patient explained: 'I could have used an explanation of the hospital stay. I'm still confused about what happened, and that is concerning to me' (Maley et al., 2016).</p> <p>'Home care nurses are not provided enough information about the hospital stay. They should be in touch with my PCP and specialists. [The] discharge information is really vague. I wish people would spend more time going over it with patients' (Maley et al., 2016).</p> <p>Patients were being vulnerable after discharge and many experienced decreased memory and concentration (Kang &amp; Jeong, 2018).</p> <p>Patients encountered several barriers to recovery at home such as cognitive barriers (Calkins et al., 2021).</p>	
Strategies for support in recovery	<p>Patients tried to overcome their vulnerability in recovery from critical illness in the ICU by using a variety of strategies, both active and passive strategies.</p> <p>Patients need assistance in their recovery and rehabilitation from cognitive impairments following critical illness in the ICU.</p>	<p>Survivors who were discharged from ICUs were physically, mentally, cognitively or socially vulnerable. They strived to overcome their vulnerability using a variety of strategies (Kang &amp; Jeong, 2018).</p> <p>'I do have to write on the calendar. So I write everything down so that I am doing something every day this week. Sometimes 2 or 3 like I am going to the taxman, yesterday and the day before I was doing things. But I had the whole week planned in the beginning and I had to write it all down to make sure I knew exactly what I was doing. Tomorrow the car is going in for service, today you were coming and get down to the taxman' (Elliott et al., 2019).</p> <p>Patients were more aware of their 'cognitive fatigue' and some volunteered strategies to deal with this, such as the use of reminders in calendars, Sudoku and pacing activity levels; one patient said: 'But you know I think that definitely helps ... when I play it [Sudoku] and the time it takes for me to do it, is all related to the fatigue factor and the concentration factor so if I am fatigued it takes forever to do it and I just have to put it down' (Elliott et al., 2019).</p> <p>Patient described difficulty understanding the nature and severity of their illness, and delayed distress with awareness of how sick or close to death they had been (Thurston et al., 2020).</p> <p>Most patients reported a positive emotional reaction to admission and recovery, with subsequent improving cognitive function. Some expressed initial shock when realising how sick they had been, but with help of family and services they had developed an understanding and acceptance of their illness journey (Thurston et al., 2020).</p> <p>'As long as you have some QoL, yes, it's worth it, anything is worth it as long as you have some QoL, where you know who you are; you know who the people are around you and you can experience life events' (Auriemma et al., 2021).</p> <p>Patients emphasis on independence and not being a burden to others, or cognitive function, with an emphasis on ability to communicate (Auriemma et al., 2021).</p> <p>Patients discussed different types of support that aided their physical, cognitive and emotional recovery including social, medical, spiritual and self-support (Calkins et al., 2021).</p> <p>Patients were able to implement strategies to assist in recovery, yet they were unable to overcome the barriers, they felt unsupported during their recovery (Calkins et al., 2021).</p> <p>Patients had memory problems and difficulty scheduling and coordinating follow-up appointments (Maley et al., 2016).</p>	<p>2 patients were referred to neurologist for further interventions, advice and guidance (Fonsmark &amp; Rosendahl-Nielsen, 2015)</p>

bitty things' (Calkins et al., 2021). Living with cognitive impairments as well as interrelated impaired physical, mental and social problems affected the patients' everyday life:

'I easily get tired. I can only do one thing a day. If I had two appointments, I couldn't make it because I would be exhausted even before I finished the first one. I cannot move as much as I did before ... I feel so close to memory a long time ago; but I cannot remember what happened just yesterday ... Now, I feel a bit timid and passive compared to the past ... When I go outside, I feel like I cannot go well'. (Kang & Jeong, 2018)

Another aspect of being exhausted and having trouble remembering was caused by impaired short-term memory. This made it challenging to manage even simple everyday tasks: 'It's my short term I'm really worried about because, you know, for me to make my way, and this is a really big house. And to make my way into any of the rooms, I get there and I'm like, what was I getting' (Nelliot et al., 2019).

Everyday life, including work and social life, was perceived differently and experienced from a new perspective following critical illness in the ICU. A patient remarked as follows about social life:

'It is not there anymore and takes me a while to try and remember and that makes it very difficult to interact with people at a level that cannot even possibly bring any enjoyment to myself or to them'. (Nelliot et al., 2019)

Another patient made the following remark about work life: 'I can't work ... can't organise things that I need. And that includes all those things that I just can't concentrate sufficiently on. That I regularly used to be able to ... paying bills and all those sorts of things I really struggle with now' (Thurston et al., 2020).

Some patients connected cognitive function to QoL (Auriemma et al., 2021; Malmgren et al., 2021). Cognitive impairment affected QoL due to symptoms such as losing the thread easily, thinking you have done something you have not done, mistaken which day of the week it is, difficulties thinking clearly or difficulties taking initiative, which were all essential to managing everyday as well as work and social life (Malmgren et al., 2021). Cognitive impairment also resulted in reduced confidence and reluctance to return to previous activities (Thurston et al., 2020). Patients' lives were affected and irremediably changed. Furthermore, managing daily tasks in everyday life and experiencing cognitive impairment following critical illness in the ICU was perceived as a challenging task.

#### 4.3 | Unsupported by the healthcare system

Patients considered that their lives had irreparably changed and encountered several cognitive barriers to recovery in general and

at home following critical illness in the ICU (Auriemma et al., 2021; Calkins et al., 2021; Ewens et al., 2018; Kang & Jeong, 2018). Concurrently, patients felt betrayed and unsupported by the healthcare system that had 'saved' them (Calkins et al., 2021; Ewens et al., 2018; Kang & Jeong, 2018). They struggled to establish what recovery should comprise to be as beneficial as possible to their recovery from cognitive impairment (Ewens et al., 2018).

Information from healthcare professionals about patients' illness, admission and discharge appeared to be very important and supportive during recovery from cognitive impairment (Calkins et al., 2021; Maley et al., 2016). One patient explained: 'I could have used an explanation of the hospital stay. I'm still confused about what happened, and that is concerning to me' (Maley et al., 2016). Patients were vulnerable after discharge; many experienced cognitive impairments such as decreased memory and concentration, which challenged any aspects of their recovery requiring the handling of information (Kang & Jeong, 2018; Maley et al., 2016). First of all, patients struggled to recall information from the ICU admission. They also had difficulty comprehending written and verbal information given to them during and after ICU admission (Calkins et al., 2021). Nevertheless, patients described that lack of information and absence of resources spent on conveying information left them with unmet needs that affected their recovery and made them feel unsupported (Calkins et al., 2021). 'Home care nurses have not provided enough information about the hospital stay. They should be in touch with my PCP (primary care physician) and specialists. [The] discharge information is really vague. I wish people would spend more time going over it with patients' (Maley et al., 2016). Patients felt vulnerable and unsupported by the healthcare system concerning support and information about how to handle cognitive impairment following critical illness in the ICU and being vulnerable became a central phenomenon during recovery (Kang & Jeong, 2018; Maley et al., 2016).

#### 4.4 | Strategies for support in recovery

Patients were struggling to survive critical illness in the ICU and described having difficulty understanding the 'nature' and severity of their illness. They also experienced delayed distress as they gained awareness of how ill they were or close to death, they had come (Thurston et al., 2020). Even though patients were vulnerable and survival triggered both negative and positive feelings in them, survival was the single most important outcome for patients. However, they valued having an acceptable QoL, especially maintaining their cognitive functions: 'As long as you have some QoL, yes, it's worth it, anything is worth it as long as you have some QoL, where you know who you are; you know who the people around you are and you can experience life events' (Auriemma et al., 2021).

Patients strived to overcome their vulnerability during recovery from critical illness in the ICU using a variety of strategies (Kang & Jeong, 2018). The strategies patients employed to overcome challenges and assist them during recovery aided their cognitive, but

also their physical and emotional recovery (Calkins et al., 2021; Ewens et al., 2018). The strategies ranged from active approaches like searching for alternatives and self-expression to passive strategies, that is either avoiding or denying their condition. The searches for alternatives focused on creating equipment providing physical assistance, whereas self-expression was about being able to express their painful and uneasy feelings rather than stifling them. Furthermore, some patients were able to mobilise internal resources latent within themselves as key strategies, including self-efficacy, optimism and resilience (Kang & Jeong, 2018). However, the strategies also included social, medical, spiritual and self-support strategies (Calkins et al., 2021; Elliott et al., 2019; Ewens et al., 2018; Kang & Jeong, 2018). Social support was provided by external resources such as families, friends, neighbours, church members and/or social welfare services; and especially the family served as a backbone by limiting their vulnerability while they were recovering from cognitive impairments (Calkins et al., 2021; Kang & Jeong, 2018). Medical support comprised visiting nurses, physical therapy and occupational therapy, which they considered had a considerable impact on their recovery (Calkins et al., 2021; Kang & Jeong, 2018). Spiritual support included prayer and a relationship with God, which some patients also found helpful in their recovery (Calkins et al., 2021; Kang & Jeong, 2018). Lastly, self-support strategies were described as taking naps, talking to someone, watching TV, reading, seeking information about their illness, taking notes and keeping a calendar (Calkins et al., 2021; Kang & Jeong, 2018).

'I do have to write on the calendar. So, I write everything down so that I am doing something every day this week. Sometimes 2 or 3 like I am going to the taxman, yesterday and the day before I was doing things. But I had the whole week planned in the beginning and I had to write it all down to make sure I knew exactly what I was doing. Tomorrow, the car is going in for service, today you were coming and we'll go down to the taxman'. (Elliott et al., 2019)

Additionally, calendar reminders, Sudoku and pacing activity levels were also volunteered strategies. One patient said: 'But, you know, I think that definitely helps ... when I play it [Sudoku]; and the time it takes for me to do it is all related to the fatigue factor and the concentration factor; so if I am fatigued, it takes forever to do it and I just have to put it down' (Elliott et al., 2019). All the strategies were important to incorporate in the recovery process following cognitive impairments to overcome the many barriers to recovery, which patients described as cognitive as well as physical, psychosocial, financial and logistic barriers (Calkins et al., 2021; Kang & Jeong, 2018).

Common to all included studies is that patients needed assistance targeting their specific cognitive impairments. However, in Fonsmark and Rosendahl-Nielsen's study (Fonsmark & Rosendahl-Nielsen, 2015), only 50% of the patients attended the ICU follow-up clinic for a visit and/or consultation, even though they met the criteria and needed assistance for their recovery. A few of the present

patients were also referred to a neurologist for further interventions, advice and guidance (Fonsmark & Rosendahl-Nielsen, 2015), but some patients had difficulties scheduling and coordinating follow-up appointments (Maley et al., 2016).

Patients needed to adapt to a new everyday life in which they relied on various types of assistance and strategies allowing them to make their life work following critical illness in the ICU. Even so, patients emphasised that independence and avoiding being a burden to others during their recovery were the most important issues (Auriemma et al., 2021). Patients needed support recovering from cognitive impairments; but some established their own strategies and chose their own directions, thereby navigating their recovery process.

## 5 | DISCUSSION

In this scoping review, we present a systematic literature search mapping the available evidence on patients' experiences of cognitive impairment following critical illness in the ICU. Patients who survive critical illness in the ICU often experience prolonged and severe cognitive impairment affecting their everyday life (Rawal et al., 2017). This scoping review shows that being able to maintain cognitive functions following critical illness was highly valued by patients. More specifically, patients often experienced poor memory and a variety of cognitive impairments following critical illness in the ICU. The study by Wilcox et al. (2013) found that cognitive impairment may affect patients at discharge, one year later and up to five years after critical illness in the ICU (Wilcox et al., 2013). The present scoping review showed that patients experienced a changed everyday-, work- and social-life, meaning that their life had irremediably changed, leaving them facing numerous challenges. This was also found in other studies where patients with cognitive impairments were struggling to 'find themselves' following critical illness in the ICU and had difficulties adapting to and resuming everyday life, for example, work and social activities (Vester et al., 2021).

Even though nursing care strives to address these cognitive challenges and acknowledge the importance of protecting the patients with early rehabilitation in the ICU by several preventive strategies, for example, 'shielding', explain what is going on and have a caring ontological approach following the five elements from FOC (Kitson, 2018). However, patients still experience debilitating cognitive impairments both in the ICU and following ICU discharge. Therefore, nurses and other allied healthcare professionals need structured and evidence-based interventions targeting cognitive impairments.

In the study by Ågård et al. (2012), patients had to relearn performing basic functions, for example, personal care and household activities. Later in their recovery process, the goals shifted towards more complex processes such as planning, organising, driving and returning to work (Ågård et al., 2012). In the study by McPeake et al. (2017), returning to employment following critical illness

was easier and more rapid if patients attended a rehabilitation programme that involved support from healthcare professionals (McPeake et al., 2017). Patients in the present scoping review also reported that their new everyday life with cognitive impairments affected their QoL. This is similar to other studies where patients reported a decreased QoL or health-related quality of life (HRQOL) in the years following critical illness (Granja et al., 2012; Jackson et al., 2015).

In their new everyday life with cognitive impairments, patients reported feeling that they were a burden to others and they underlined the importance of upholding a certain level of independence in their lives. In line herewith, Czerwonka et al. (2014) found that patients often felt that they were a burden to others, especially to their family, and that their weakened state compromised their ability to lead a normal everyday life. However, being a burden to someone may motivate patients to make an effort to recover faster and regain independence (Czerwonka et al., 2014). Patients were dependent on the healthcare system and, in some cases, also on their families. Nevertheless, this scoping review also found that patients felt betrayed and unsupported by the healthcare system. They needed information during and following critical illness in the ICU, and recovery support strategies were essential to managing everyday life. These findings are in line with those of other studies where both patients and relatives required more information and guidance on the long-term recovery process along with knowledge allowing them to establish if the patients' recovery was progressing normally (Czerwonka et al., 2014). According to Bench et al. (2015), a critical care discharge information pack for patients and families improved patients' understanding of their critical illness and helped them optimise their rehabilitation (Bench et al., 2015). The topic of strategies for recovery and rehabilitation from critical illness in the ICU has recently triggered discussion among ICU researchers and stakeholders (Needham et al., 2012). In relation to Needham et al. (2012), improving the outcome for ICU patients and relatives requires collaboration between healthcare professionals and researchers in both inpatient and outpatient settings (Needham et al., 2012). Likewise, McPeake et al. (2021) claim that management strategies should inform the discussion about future priorities regarding the treatment of cognitive impairment following critical illness in the ICU (McPeake et al., 2021). In the studies encompassed by the present scoping review, patients made use of various strategies in their recovery and rehabilitation from cognitive impairments in the ICU; even so, some expressed doubt about what their recovery and rehabilitation should be like. A growing body of literature has explored cognitive impairments, but the evidence is sparse on interventions targeting recovery and rehabilitation for patients experiencing cognitive impairments following critical illness in the ICU (Rawal et al., 2017). However, according to the literature, several interventions may potentially be useful and have a beneficial effect on patients' and relatives' cognitive outcomes in this situation. These interventions include ICU follow-up clinics (Griffiths et al., 2006; Jensen et al., 2015), patient diaries (Egerod et al., 2007; Jones et al., 2010), peer support programmes

(Haines et al., 2018; Vester et al., 2021), cognitive behavioural therapy (Mehlhorn et al., 2014), goal management training (Stamenova & Levine, 2019), nature-based therapy (Minton & Batten, 2016) and mindfulness (Chambers et al., 2008).

Cognitive impairment is a frequently unrecognised post-ICU complication with a considerable impact on patients' everyday life that may last for months or years (Muradov et al., 2021). The ageing population of the Western world and improved survival from critical illness mean that a growing number of patients will be experiencing cognitive impairment after their ICU discharge.

Researchers, nurses and other allied healthcare professionals need to pay more attention to cognitive impairments during and after ICU admission. Patients and relatives need information and assistance to make life work. They also need to prepare for a time that may be marred by cognitive impairment (Agård et al., 2014; Bench et al., 2015). The knowledge derived from this review is important and should be incorporated into nursing care in the ICU and in aftercare to support patients with cognitive impairments. Future research is needed into interventions targeting cognitive impairments during the recovery and rehabilitation from critical illness in the ICU (Nedergaard et al., 2017).

## 5.1 | Limitations

This scoping review has limitations. Despite a broad and systematic literature search, no studies published before 2015 were found. Thus, we may theoretically have missed relevant publications. Some limitations were found in relation to the included studies: In the study by Fonsmark and Rosendahl-Nielsen (2015), it remains unclear if the data were derived from a questionnaire or interviews (Fonsmark & Rosendahl-Nielsen, 2015). In the study by Calkins et al. (2021), the authors referred to interpretive phenomenology guiding a larger study without further explanations or references (Calkins et al., 2021). In both cases, the authors were contacted to obtain additional information, but we received no reply. Furthermore, in the study by Maley et al. (2016), no sample size calculation was performed (Maley et al., 2016).

## 5.2 | Strengths

This scoping review also has several strengths. The present review is the first to illuminate and explore patients' experiences of cognitive impairments following critical illness in the ICU. Using the framework by the Joanna Briggs Institute for Scoping Reviews secured a rigorous methodological approach. To the best of our knowledge, the included research reflects all the available evidence on patients' experience of cognitive impairments following critical illness in the ICU. Furthermore, using the MMAT tool contributed to appraising the methodological quality and rigour of the studies of which nine were rated as being of good quality and two studies were rated as being of moderate quality.

## 6 | CONCLUSION

The four main themes identified: 'Experiencing poor memory', 'Managing everyday life', 'Unsupported by the healthcare system' and 'Strategies for support in recovery' provided perspectives and contributed profound knowledge mapping the available evidence on patients' experiences of cognitive impairment following critical illness in the ICU. Patients experienced a variety of cognitive impairments following critical illness in the ICU affecting and challenging their QoL and their adaptation to everyday life. Patients made use of various strategies in their recovery and rehabilitation to regain independence and avoid being a burden to others. They expressed a need for information during and following critical illness in the ICU to support their understanding of their situation and to support their recovery and rehabilitation. Without such information, they felt unsupported and betrayed by the healthcare system.

## 7 | RELEVANCE TO CLINICAL PRACTICE

Cognitive impairment following critical illness in the ICU challenges patients and their families as well as the healthcare system. Based on patients' experiences presented in this scoping review, it is important to develop interventions supporting inpatients and outpatients by targeting their recovery and rehabilitation from cognitive impairment. It is essential for nurses and other allied healthcare professionals to identify these vulnerable patients in the ICU. Changing the ICU nurses' approach in caring for these patients can support them in managing the patients' cognitive impairments and underpin their individual recovery needs.

Future research is needed to investigate interventions targeting patients' cognitive impairment following critical illness in the ICU, thereby supporting this vulnerable group of patients and their families while reducing the ensuing burdens on the healthcare system and health economy.

### AUTHOR CONTRIBUTIONS

The idea for conducting the scoping review originated from Pia Dreyer, but the scoping review protocol was conducted by Anette Bjerregaard Alrø, Helene Korvenius Nedergaard, Helle Svenningsen, Hanne Irene Jensen and Pia Dreyer. The systematic search for the scoping review was undertaken by Anette Bjerregaard Alrø. Data were extracted and quality appraised by Anette Bjerregaard Alrø and Helene Korvenius Nedergaard in consultation with Helle Svenningsen. Anette Bjerregaard Alrø secured the methodology, conducted the analysis and interpreted the data. Furthermore, Anette Bjerregaard Alrø and Helene Korvenius Nedergaard made substantial contributions to the review regarding drafting of the manuscript, whereas Helle Svenningsen, Hanne Irene Jensen and Pia Dreyer revised the manuscript critically and contributed with substantial improvements. Thus, all authors were involved in all phases of the manuscript, and the final approval was provided by

all. Each author agreed to being accountable for all aspects of the manuscript.

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### CONFLICT OF INTEREST

The authors have no conflicting interests in relation to the research, authorship and/or publication of this article.

### DATA AVAILABILITY STATEMENT

The data that supports this scoping review is available on request from the first author.

### ETHICS STATEMENT

Under Danish law, ethics approval was not required for this scoping review.

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## SUPPORTING INFORMATION

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