Servir, 2(7), e30184
DOI:10.48492/servir0207.30184

A INTERVENÇÃO DO ENFERMEIRO DE REABILITAÇÃO NO DESMAME VENTILATÓRIO DIFÍCIL DO DOENTE CRÍTICO: UM PROTOCOLO DE SCOPING REVIEW

THE INTERVENTION OF REHABILITATION NURSE IN DIFFICULT VENTILATORY WEANING OF CRITICALLY ILL PATIENTS: A SCOPING REVIEW PROTOCOL

LA INTERVENCIÓN DE LA ENFERMERA REHABILITADORA EN EL DESTETE VENTILATORIO DIFÍCIL DEL PACIENTE CRÍTICO: UN PROTOCOLO DE SCOPING REVIEW

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RECEIVED: 16th March, 2023
ACCEPTED: 9th October, 2023
PUBLISHED: 1st November, 2023

2023

RESUMO

Introdução: A falha do desmame ventilatório define-se pela intolerância do doente em relação à respiração espontânea. O trabalho eficaz em equipa é importante para o sucesso do desmame, devendo o enfermeiro de reabilitação ter um papel importante, visto a sua intervenção contribuir para o desmame ventilatório eficaz, promovendo a recuperação e reduzindo o tempo de internamento do doente. Portanto, a adoção de protocolos padronizados é fundamental nesse processo.

Objetivo: Mapear e analisar a intervenção de reabilitação no desmame ventilatório difícil do doente crítico para a elaboração de um protocolo.

Métodos: A scoping review seguirá as recomendações do JBI® e do Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR). Incluirá estudos quantitativos, qualitativos ou de métodos mistos, bem como revisões sistemáticas. Uma pesquisa inicial limitada no Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCO, e MEDLINE via PUBMED será realizada e, posteriormente, uma pesquisa extensa, usando todas as palavras-chave identificadas e termos de indexação em bancos de dados e literatura não publicada.

Conclusão: Prevê-se que esta scoping review proporcione a protocolização do desmame ventilatório difícil no doente crítico e identifique a necessidade de investigação científica nesta temática.

Palavras-chave: desmame do ventilador; enfermagem em reabilitação; intubação intratraqueal; respiração artificial; unidades de terapia intensiva

ABSTRACT

Introduction: Ventilatory weaning failure is defined by non-tolerance the patient regarding the spontaneous breathing. Effective teamwork is important for the weaning success, and the rehabilitation nurse should have an important role, since his intervention contributes to improve an effective ventilatory weaning, which promotes recovery and reduces the intake time of the patient. Therefore, the adoption of standardized protocols is fundamental in this process.

Objective: To map and analyze the rehabilitation intervention in difficult ventilatory weaning of critically ill patients in order to create a protocol.

Methods: The scoping review will follow the JBI® and the Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR) recommendations. It will include quantitative, qualitative, or mixed methods studies, and well as systematic reviews. An initial limited search in Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCO, and MEDLINE via PUBMED will be performed and after that an extensive search using all identified keywords and index terms will be carried out in databases and unpublished literature.

Conclusion: It is expected that this scoping review will provide the protocolization of difficult ventilatory weaning in the critically ill patient and identify the need for scientific research on this topic.

Keywords: intensive care units; intubation, intratracheal; respiration artificial; ventilator weaning

RESUMEN

Introducción: El fracaso del destete ventilatorio se define por la falta de tolerancia del paciente a la respiración espontánea. El trabajo en equipo efectivo es importante para el éxito del destete, y la enfermera de rehabilitación debe tener un papel importante, ya que su intervención contribuye a mejorar un deteste ventilatorio efectivo, que promueve la recuperación y reduce el tiempo de ingreso del paciente. Por lo tanto, la adopción de protocolos estandarizados es fundamental en este proceso.

Objetivo: Mapear y analizar la intervención en el destete ventilatorio del paciente crítico para la elaboración de un protocolo.

Métodos: La scoping review seguirá las recomendaciones del JBI® y Preferred Reporting Items for Systematic Reviews and Meta-Analysis extension for Scoping Reviews (PRISMA-ScR). Incluirá estudios de métodos cuantitativos o mixtos, así como revisiones sistemáticas. Se realizará una búsqueda limitada inicial en in Cumulative Index to Nursing and Allied Health Literature (CINAHL) a través de EBSCO, y MEDLINE a través de PUBMED y, luego, se realizará una búsqueda exhaustiva utilizando todas las palabras clave identificadas y términos de índice en bases de datos y literatura no publicada. Los términos de índice en bases de datos y literatura no publicada.

Conclusión: Se espera que esta scoping review proporcione la protocolización de la desconexión ventilatoria difícil en el paciente crítico y identificar la necesidad de investigación científica sobre este tema.

Palabras Clave: destete del ventilador; intubación intratraqueal; respiración artificial; unidades de cuidados intensivos.

Introduction

Patients admitted in Intensive Care Unit's (ICU's) have failure or imminent failure of one or more organic systems (Jeong, 2018). A large number of this patients is connected to the ventilator, benefiting from an artificial airway, since the aim is to recover acute patients (Burns et al., 2021; Walter et al., 2018). However, patients should be released from Invasive Mechanical Ventilation (IMV) as soon as their condition improves and they are able to maintain spontaneous breathing (Fan et al., 2017). IMV can be stopped abruptly by direct extubation, or a gradual reduction of ventilation can take place (Burns et al., 2021).

Ventilatory weaning may consist of more than one attempt of spontaneous breathing, and there are different practices for discontinuing IMV, which can be challenging, as it is not possible to predict whether extubation will be (Pinheiro, 2017). In an International Consensus Conference, in 2007, a weaning classification was defined, subdividing it into weaning as simple, difficult or prolonged (Boles et al., 2007). The failure of ventilatory weaning is characterized by the patient not being able to support spontaneous breathing and/or the need for tracheal reintubation to restart IMV, 48 hours after extubation (Merjildo et al., 2019). Difficult weaning is considered when patients do not comply with the initial weaning, requiring up to three attempts or seven days after the first attempt at spontaneous breathing for successful weaning (Boles et al., 2007). To help with ventilatory weaning, current international guidelines recommend daily assessment of readiness for extubation with a spontaneous breathing trial, regular breaks in sedation, early mobilization and protocolized rehabilitation (Girard et al., 2017).

In turn, rehabilitation nursing promotes the recovery of the patients with respiratory failure, which can reduce the incidence of complications, relieve negative emotions, and improve their quality of life (Jin et al., 2021). Due to difficulty experienced by those involved in these situations, the creation of a protocol to standardize rehabilitative care becomes essential.

In order to respond to this type of patient, we propose the elaboration of a Scoping Review (ScR), using the scientific evidence found and developing a data extraction instrument, which allowed access to knowledge about the practice of rehabilitation interventions, in the context of care for critically ill patients with IMV under difficult ventilatory weaning.

The main objective will be map and analyze the rehabilitation intervention in difficult ventilatory weaning of critically ill patients to create an action protocol and answer the research question "In critically ill patients with difficult ventilatory weaning, in an intensive care unit, which is(are) the rehabilitation intervention(s) that promote successful weaning?". This question will also serve as a motto for the development of the proposed ScR.

1. Theoretical Framework

IMV is paramount in saving lives, however a prolonged stay in the ICU entails complications, sometimes associated with extubation failure, such as higher mortality and increased risk of needing a tracheostomy (Fan et al., 2017; Wang et al., 2018).

The cardiac and/or respiratory complications presented by patients during weaning process, can be overwhelmed by reducing the ventilatory load, training the ventilatory muscles and reducing the cardiac workload, with early mobilization and rehabilitation (Funk, 2012). It is equally essential to adopt standardized protocols that reduce the time of exposure to IMV and also the intervention of the interdisciplinary team (Tavares et al., 2018). In this context, the rehabilitation nurse can be an important professional to promote the success of ventilatory weaning, through a personalized assessment of the patient and the implementation of motor and respiratory (Outeiro & Soares, 2021).

The American College of Chest Physicians elaborated four conditional guidelines for IMV weaning in critically ill patients, after systematic review, and directed to the practice of a rehabilitation protocol, focusing on early mobilization and ventilator release, performing a test of cuff deflation in patients who meet the criteria for extubation, but are still considered at high risk (Girard et al., 2017). Fan and collaborators (2017), suggest for critically ill patients ventilated for

more than 24 hours, that the initial Spontaneous Breathing Test (SBT) should be conducted with an increase in inspiratory pressure (to overcome the work of breathing imposed by the artificial airway) followed by SBT so that patients with a greater probability successful extubation can be identified.

Due to difficulty experienced by those involved in these situations, patients and rehabilitators, our main objective is to map and analyze the scientific evidence produced on rehabilitation intervention in difficult ventilatory weaning, within critically ill patients in order to create a protocol to standardize rehabilitation care. Therefore, it is crucial to understand which rehabilitation interventions are performed on critically ill patients in difficult ventilatory weaning.

A preliminary search in International Prospective Register of Systematic Reviews (PROSPERO), JBI® and Open Science Framework (OSF) was performed: there weren´t identified no current or ongoing systematic reviews or on the subject.

According to Peters and collaborators (2022), ScR provide a uniform approach to synthesizing evidence, gathering, and describing to present a summary of it. Therefore, this type of review is in line what we intend to obtain.

2. Methods

This scoping review will be carried out in accordance with the JBI® methodology for scoping reviews (Munn et al., 2022; Peters et al., 2022). Will consider experimental and quasi-experimental study designs, analytical observational studies, cross-sectional studies, and longitudinal studies. Descriptive observational studies will also be included. Qualitative studies that focus on qualitative data (including, but not limited to, designs such as phenomenology, grounded theory, ethnography, qualitative description, action research, and feminist research) will be included. In addition, primary studies from systematic reviews that meet the inclusion criteria will also be considered, depending on the research question.

The research strategy consists of a limited initial search will be performed in Cumulative Index to Nursing and Allied Health Literature (CINAHL) via EBSCO, and MEDLINE via PUBMED, to identify articles on the topic. Text words contained in the titles and abstracts of relevant articles, as well as the indexing terms used to describe the articles, will be used to develop a complete search strategy (Appendix I). The search strategy, including all keywords (according to MESH terms: MESH – Medical Subject Healdings/ DECS- Descriptors in Health Sciences) and indexing terms identified (natural language), will be adjusted for each source of information. Reference lists of selected articles will be examined for additional sources of information, and we will evaluate the full text according to the inclusion criteria. A full search will include CINAHL (via EBSCO), MEDLINE (via PUBMED), Nursing & Allied Health Collection, Cochrane Database of Systematic Reviews, MedicLatina, Web of Science and Scopus. We will include a search for gray literature and unpublished material in scientific repositories on Repositório Científico de Acesso Aberto de Portugal (RCAAP), OpenGrey, Google Scholar, ProQuest and Mednar. We will include articles published in Portuguese, English, Spanish and French.

The selection of studies occurs after the search and the results will be managed in EndNote® online with WoS version (Clarivate Analytics, US) and a duplicate elimination will be performed. Titles and abstracts will be evaluated by two independent reviewers and potentially relevant sources will be fully retrieved, and their citation details will be transcribed into a data extraction table. Reasons for excluding full text sources of evidence that do not meet the inclusion criteria will be recorded and reported in the scoping review. In case of disagreement, the two independent reviewers will discuss between them, and a third reviewer will be consulted for a tiebreak. The results of the search and the literature inclusion process will be fully reported in the final scoping review and presented using the PRISMA-ScR diagram (Tricco et al., 2018).

Extracted data will include specific details about participants, concept, context, study methods, and key findings relevant to the review question. This information will be extracted from the included literature using a standardized data tool, which form is provided in Appendix II. The preliminary data extraction tool will be modified and revised as needed during the data extraction process for each source of evidence included: the modifications will be explained in the final scoping review. When necessary, we will contact the authors of the evidence found in order to deliver missing or additional data.

In this scoping review, the evidence found will be gathered through a descriptive summary and content analysis. The summary will describe the characteristics of the included studies (study design, year of publication, characteristics of the study populations and geographic location of the countries where the studies were carried out) and will be presented in a table form. Content analysis will be presented in a narrative form and will highlight the rehabilitation interventions in critically ill ventilator weaning. Guidelines for future research will also be presented.

Table 1 – Scoping Review ‘s Research Strategy

Scoping Review ‘s Research Strategy	
1	Introductory search without identifying a scoping review on the topic: Difficult ventilatory weaning in critically ill patients.
2	Identification of the most used and appropriate words/ indexing terms for the selected databases – MeSH/ DeCS terms and NCBI: MeSH database.
3	Construction of the boolean expression.
4	Search in two recommended databases: MEDLINE (via PubMed) and CINAHL ® (via EBSCOhost).
5	Analysis of words/indexing terms present in the titles and abstracts of the articles obtained.
6	Search in other databases, applying the respective boolean expression.
7	Gray literature search.
8	Exportation of the evidence to EndNote® online with WoS version (Clarivate Analytics, US) reference management software.
9	Checking and removing duplicate literature.
10	Application of inclusion criteria: articles in Portuguese, English, Spanish and French.
11	Analysis of evidence according to title and abstract by two independent reviewers.
12	Analysis of evidence according to the full text by two independent reviewers.
13	If there are disagreements in the evidence selection, the third independent reviewer will be consulted.
14	Analysis of references from the selected evidence in the full text reading stage.
15	Data extraction and analysis according to the form developed by the reviewers.
16	Presentation of the obtained data.

Source: adapted from Peters and collaborators (2020)

2.1 Participants

This scoping review will consider critically ill patients over 18 years old, with intratracheal intubation and who have had rehabilitation intervention.

Critical illness is characterized by organ dysfunctions of six fundamental systems – cardiovascular, respiratory, neurological, hematological, renal, and hepatic (Vincent & Creteur, 2019). The critically ill patient is evaluated and defined with a degree of critical illness: for the treatment selection all variables are considering (Vincent & Creteur, 2019). When the patient requires artificial respiration, an endotracheal tube is used for intubation, which is an invasive and advanced support procedure that aims to protect the patient’s health (Tavares et al., 2022).

As our main goal is to develop a difficult ventilator weaning protocol in an adult and elderly population, the participants in the evidence analyzed should be 18 years or over.

The World Health Organization (2021) defines rehabilitation as “a set of interventions designed to optimize functioning and reduce disability in individuals with health conditions in interaction with their environment”.

Studies in which patients have a tracheostomy will be excluded, as this technique is the result of prolonged mechanical ventilation or has been performed due to obstruction of the upper airways or surgeries in the face and neck (Andriolo et al., 2015; Kristinsdottir et al., 2022). In this situation, weaning may not depend on rehabilitation.

2.2. Concept

Studies with patients with difficult ventilatory weaning will be included since this is the protocol core. Therefore, studies that refer to simple or prolonged ventilatory weaning due to underlying disease will be excluded.

Ventilator weaning is an essential and universal element in the care of critically ill patients and can be defined as the process of removing the ventilator from the patient, transferring the work of breathing from the ventilator to the patient, enable him of being free from IMV (Boles et al., 2007; Burns et al., 2018). According to the International Consensus Conference, it is considered a difficult weaning when the patient is only successful in extubation after three SBT or requires seven days after the first test to achieve it. (Jeong et al., 2018). In 2018, Weaning according to a New Definition (WIND) appeared, which still has little published scientific evidence, therefore, the definition defined in this classification will not be considered (Béduneau et al., 2017).

2.3. Context

An ICU is organized to provide care to critically ill patients (intensive and specialized medical and nursing care), where the patient is monitored and have physiological support that enables his organs to function and sustain his life (Marshall et al., 2017).

In the ICU there are three levels of care. For this scoping review, we pretend to study the ICU level III, which are units that admit patient with the need of multiorgan support or advanced monitoring techniques, so it is required at least one nurse for each patient. In ICU level III, the care provided address systems as respiratory, cardiovascular, renal, neurological, gastrointestinal and others such as analgesia and neuromuscular monitoring (Jackson & Cairns, 2021).

Therefore, studies in ICU level I or II and other inpatient units will be excluded, as they don´t have patients on IMV, so there isn´t ventilatory weaning.

2.4. Data Collection Instruments

Table 2 – Data Extraction Tool

DATA EXTRACTION TOOL	
AUTHOR(S)	
PUBLICATION YEAR	
PLACE OF PUBLICATION/ JOURNAL	
COUNTRY OF ORIGIN/ PUBLICATION	
PURPOSE OF THE STUDY/ RESEARCH QUESTION	
POPULATION SIZE/ RECRUITMENT CONTEXT	
METHODOLOGY/ TYPE OF STUDY	
REHABILITATION INTERVENTION (WEANING PROCEDURE; EVALUATION AND MONITORING)	
RESULTS	
MAIN CONCLUSIONS	
COMMENTS	

Source: Prepared by the author (2022)

Conclusion

With the elaboration of this scoping review, it is expected that will be possible to use the scientific evidence found for the elaboration of an action protocol that will lead to a standardization and improvement of rehabilitation care for the benefit of critically ill. In turn, we seek to contribute to this area of research, identifying the needs for future research.

Conflict of Interests

There is no conflict of interest in this investigation.

Funding

No funding was received by any of the authors specifically relevant to this manuscript.

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