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CONCEPT ANALYSIS

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Communication with mechanically ventilated patients in intensive care units: A concept analysis

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Abstract

Aims: The aim of this study was to perform a concept analysis of communication with mechanically ventilated patients in intensive care units and present a preliminary model for communication practice with these patients.

Design: The Im & Meleis approach for concept analysis guided the study.

Search Methods: A literature search was performed in January 2022 in MEDLINE, Embase, CINAHL, psycINFO and Scopus, limited to 1998–2022. The main medical subject headings search terms used were artificial respiration, communication and critical care. The search resulted in 10,698 unique references.

Review Methods: After a blinded review by two authors, 108 references were included. Core concepts and terminology related to communication with mechanically ventilated patients were defined by content analytic methods. The concepts were then grouped into main categories after proposing relationships between them. As a final step, a preliminary model for communication with mechanically ventilated patients was developed.

Results: We identified 39 different phrases to describe the mechanically ventilated patient. A total of 60 relevant concepts describing the communication with mechanically ventilated patients in intensive care were identified. The concepts were categorized into five main categories in a conceptual map. The preliminary model encompasses the unique communication practice when interacting with mechanically ventilated patients in intensive care units.

Conclusion: Highlighting different perspectives of the communication between mechanically ventilated patients and providers through concept analysis has contributed to a deeper understanding of the phenomena and the complexity of communication when the patients have limited possibilities to express themselves.

Impact: A clear definition of concepts is needed in the further development of guidelines and recommendations for patient care in intensive care, as well as in future research. The preliminary model will be tested further.

Patient or Public Contribution: No patient or public contribution, as this is a concept analysis of previous research.

KEYWORDS
communication, concept analysis, critical care, literature review, non-verbal communication, nursing, patient comfort, quality of health care, social theory

1 | INTRODUCTION

Since intensive care units (ICUs) began to develop in the late 1950s, there has been an outstanding technological evolution in these specialized departments and an increase in acute and critically ill patients receiving mechanical ventilation (Vincent & Creteur, 2019). In the United States alone, prior to the SARS-CoV-2 pandemic, an estimated 5–6 million patients received ICU care annually (Society of Critical Care Medicine, 2022). When critically ill patients are intubated and receive mechanical ventilation, the patient becomes voiceless (i.e. loses the ability to vocalize), due to the inflated cuff blocking the air passing through the vocal cords. Although the voicelessness may be transient, this can be scary, frustrating and a barrier to patient involvement in care and treatment decisions (Danielis et al., 2020; Egerod et al., 2015; Holm & Dreyer, 2018a). Both providers and patients have reported challenges in communication that impact the quality of care (Happ, 2021; Holm et al., 2020; Karlsen et al., 2020). Recently, a paradigmatic shift in treatment has resulted in the use of less sedative medication as this practice has proven beneficial for survival, length of ICU admission and days on mechanical ventilation (Devlin et al., 2018; Vincent & Creteur, 2015). A communicative, conscious mechanically ventilated patient is now more common in the ICU (Vincent, 2017; Vincent et al., 2016). This has gradually changed the focus towards a more comprehensive understanding of the long-term intensive care treatments' effects on the patient and relatives, and the need for a humanizing and caring environment (Kvande et al., 2021; Velasco Bueno & La Calle, 2020). During the covid pandemic, there have unfortunately been limited possibilities for inclusion of patients and surrogates in decision-making due to both hospital policies restricting visitation and lack of resources, as well as fear of spreading the disease while using communication aids that require cuff-deflation (Digby et al., 2022; Freeman Sanderson et al., 2021). It is uncertain if the pandemic might have contributed to a more paternalistic organization of ICUs.

2 | BACKGROUND

Although a variety of communication aids exist, such as communication boards with an alphabet or pictograms (electronic and manual), tracheostomy speech valves, above-cuff vocalization, or pen and paper, there is no consensus on the most efficient or effective communication aid for patients who are on mechanical ventilation (Carruthers et al., 2017; Kuyler & Johnson, 2021; Ten Hoorn et al., 2016). Additionally, patients who require mechanical ventilation vary and fluctuate in their level of communication skills, both physically and cognitively, as well as their abilities to utilize aids. Previous research reveals gaps in the research on this topic, but also a need for a more holistic and humanistic approach in patient encounters in the ICU (Olding et al., 2016; Velasco Bueno & La Calle, 2020). It is also argued that most of the literature on treatment decision-making communication focused on the family who acts as surrogates in decision-making while the patient is admitted to the ICU. However, this picture may be inaccurate as the degree to which patients are able to participate is diverse and ranges from no participation (e.g. due to sedation) to a high level of participation (Lindberg et al., 2015; Olding et al., 2016).

Concepts and theories can guide practice, ensure a unified standard and create measurable variables for testing interventions. Concepts are 'formed by the identification of characteristics common to a class of objects and the phenomena and the clustering of these characteristics' (Im & Meleis, 2021, p. 11). Searching the literature about communication with mechanically ventilated patients quickly reveals that it is not very well-defined area. Despite the fact that communication strategies to ensure patients' informational needs are ranked as the fourth most important research topic by top ICU researchers (Blackwood et al., 2011), a concept analysis to describe the interpersonal communication between nurses and mechanically ventilated patients has to our knowledge still not been published. The research literature mostly focuses on the patient, nurse or family member's experience of communicating and how to 'solve' the communication challenges by introducing augmentative and alternative communication (AAC). Although strategies and tools can be used to optimize communication with voiceless patients (Beukelman et al., 2020; Garrett et al., 2007), there is a need for a new and more nuanced understanding of concepts to shed light on the existing communication practice (Im & Meleis, 2021). A deeper understanding of underlying concepts may also influence clinical practice and the development of robust, well-designed research.

3 | THE REVIEW

3.1 | Aims

The aim of this study was to perform a concept analysis on communication with mechanically ventilated patients in intensive care units and present a preliminary model for communication practice with these patients. The following research questions guided the process:

- How is the communication and interaction with mechanically ventilated patients described?

- Which phrases are used to describe the patient population?
- Which concepts are defined which relate to communication and interaction?
- Based on the knowledge of the communication, concepts and phrases used, what would a model to guide clinical practice look like?

3.2 | Design

Im & Meleis's approach for concept analysis (Im & Meleis, 2021) was chosen where we explored the phenomenon of communication with mechanically ventilated patients in ICUs through multiple perspectives to achieve a broad description (Elo & Kyngäs, 2008). An international expert panel was created of six nurses experienced in the ICU field and one nurse with expertise in communication research was constituted from three countries (Denmark, Norway and the United States of America), ensuring broad experience in research, education and practice.

We followed Im and Meleis's (2021) suggested steps for a concept analysis that involved (1) systematically gathering information about the most common concepts used in the field, (2) analysing the concepts, redeveloping and suggesting definitions and then (3) ultimately creating and encompassing the core concepts in a conceptual map. Concept analysis can also function as a vital part of the process of theory development (Im & Meleis, 2021; Rodgers et al., 2018).

3.3 | Search methods

A review of relevant published literature was performed. First, we synthesized several search strategies from literature reviews that the team members performed. In January 2022, the first author collaborated with two librarians to perform a search in MEDLINE ALL (Ovid), Embase (Ovid), CINAHL Complete (EBSCO), APA psycINFO (Ovid) and Scopus (Elsevier), limited to 1998–2022. The reason for this limitation is that 1998 was a turning point in the understanding of benefits of lighter sedation, due to new research which was published. This has led to the implementation of practice guidelines promoting analgesia before sedation (Devlin et al., 2018; Vincent et al., 2016; Vincent & Creteur, 2015). The main medical subject headings (MeSH) search terms used were artificial respiration, communication and critical care, but they were adjusted to each database. The search was also complemented with subheadings in the MeSH tree structure that were not included under the main headings relevant to the topic such as communication aids for disabled/intensive care units, augmentative communication or other frequently used free text words. Full search strategy can be found in Supplemental Material S1: Search strategy. The literature review and selection of literature were inspired by the systematic literature review approach (Rethlefsen et al., 2021), at the same time we wanted a search that captured a multitude of methods and concepts.

3.4 | Search outcome

A total of 17,603 references were identified. The librarian's removal of duplicates using Bramer et al.'s duplicate identification strategy (Bramer et al., 2016) resulted in 10,689 references. Two of the authors independently reviewed all of the retrieved literature (n = 10,689) using a blinded approach in Rayyan (*Rayyan-intelligent systematic review* 2022) and then compared the results manually. Initially, 90 conflicts were identified but resolved based on the criteria. The included literature was then imported into an Endnote library for further investigation. A more thorough description of the literature search and a PRISMA scheme with additional information about the inclusion and exclusion criteria can be found in Figure 1.

The selected literature was also presented to the expert panel. The data collection phase resulted in 108 relevant sources for use in conceptual analysis, which can be found in Supplemental Material S2: Articles included in the concept analysis.

3.5 | Qualitative appraisal

Quality assessment of the sources was not relevant for the concept analysis, as the sources were used to inform the expert panel about how, where and in what way communication with mechanically ventilated patients was described.

3.6 | Data abstraction

Central concepts used were identified and augmented by the expert panel's knowledge of the literature and content expertise, extensive research on the topic and experience in clinical practice about communication with patients on mechanical ventilation. We identified and extracted both concepts relevant to the communication and interaction, as well as phrases used to define the patient population in a deductive manner (Elo & Kyngäs, 2008). The first and second authors thoroughly reviewed this process to ensure rigour, transparency and not overlook central concepts.

3.7 | Synthesis

New definitions of the concepts were proposed condensing the existing definitions identified and will be presented in the results. The core concepts were then grouped into categories to obtain an overview of their connection and were illustrated in a conceptual map (Elo & Kyngäs, 2008). The final concepts were presented to the expert panel, which agreed on the central meaning of the concepts. The expert panel also held several meetings where the model was discussed and defined and multiple understandings of the phenomena were explored. Lastly, we created a preliminary model to describe communication practice in intensive care, based on the understanding of the identified concepts.

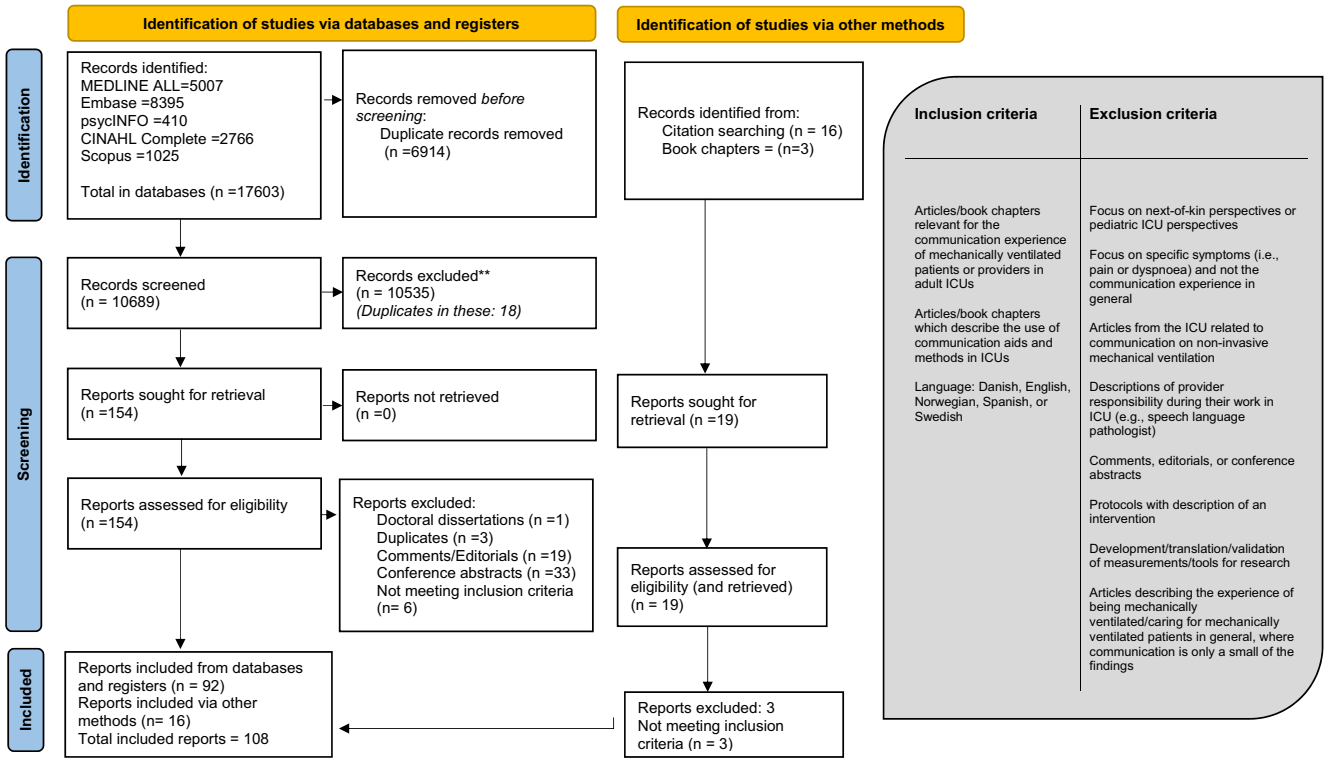

FIGURE 1 PRISMA 2020 flow diagram

4 | RESULTS

The results are divided into three main topics: Definitions of core concepts of communication practice in ICUs, identified differences from normal communication practice, and model for communication practice with mechanically ventilated patients.

4.1 | Definitions of core concepts of communication practice in ICUs

In the literature, we found 39 words to describe the patient population. These are listed in.

Table 1.

As Table 1 shows, mechanically ventilated patients and their loss of voice due to the intubation are described in many ways. This highlights how different practice and research traditions define the patient population and their communication challenges in a variety of ways.

4.2 | Identified differences from normal communication practice

As in all human encounters, provider-patient communication is an interpersonal interaction with an exchange of thoughts, beliefs, opinions, concerns and needs. The main difference in the communication practice with a patient on mechanical ventilation in ICUs compared to normal communication is that they lack the ability to deliver vocal messages and respond to the providers' communication. The messages and interaction can only be delivered if both communicators are aware that there is a need to express something of meaning. Normally, this occurs when a communicator uses his/her voice to say something. Therefore, the dialogic aspect is lacking to a large extent. This impedes communication if it is initiated by the patient since they need to achieve attention from the provider and then try to express themselves without vocal statements. Hence, patients must use other methods, either non-vocal (e.g. gestures, facial expressions) or communication aids (e.g. writing, communication boards, etc.). Another significant difference identified in the literature is the patient's absolute dependence on the providers' correct interpretation of their intended message. It is difficult for the patient to correct the provider if the interpretation is incorrect, and this may lead to confusion regarding the content of the communication and the patient's message. As the patient cannot use a natural communication style, it creates an inequal communication process. This may also lead to a communication breakdown if understanding is not achieved. These main challenges and characteristics of provider-patient communication in the ICU are illustrated in Figure 2.

Figure 2 illustrates that the patients on a mechanical ventilator have non-vocal opportunities to communicate, whereas the providers have both vocal and non-vocal opportunities. Additionally, the intensive care environment affects the communication setting; both as a place for acute-critical treatment, but also by the noise level, the number of providers and patients and the use of complex

TABLE 1 Phrases used to describe the patient population in intensive care units

Phrases used to describe patient population by their abilities to vocalize
Awake but unable to speak (Leung et al., 2017)
Inability to speak/communicate (Albayram & Yava, 2020; Choi & Tate, 2021; Foa et al., 2016; Hosseini et al., 2018; Ijssennagger et al., 2018; Sutt et al., 2015)
Intubated (intensive care unit) patients (being unable to speak; El-Soussi et al., 2015; Happ et al., 2014; Otuzoğlu & Karahan, 2013)
Lack of phonation (Freeman-Sanderson et al., 2016a)
Loss of voice (Freeman-Sanderson et al., 2016b)
Patients with transient speech loss (Mobasheri et al., 2016)
Temporary loss of speech function or permanent speech impairments (Holm et al., 2020)
Temporarily non-speaking patients (Happ, Roesch, et al., 2004; Happ, Tuite, et al., 2004)
Suddenly speechless critical care patients (Rodriguez et al., 2016)
Unable to speak (out loud) (Ariffin et al., 2020; Carroll, 2004, 2007; Yavuz & Gursoy, 2022)
Voiceless patients (in intensive care units; Ariffin et al., 2020; Carruthers et al., 2017; Ju et al., 2021; Koszalinski et al., 2015; Radtke et al., 2011)
Phrases used to describe patient population by the level of consciousness or cognitive abilities
Cognitively intact ventilator-dependent patient (Leder et al., 2013)
Conscious while receiving/during mechanical ventilator treatment/respirator treatment (Karlsen et al., 2022; Karlsson et al., 2012)
Conscious and mechanically ventilated critically ill patients (Ten Hoorn et al., 2016)
Critically ill patients (in the ICU, in a dependent and vulnerable position; Kuyler & Johnson, 2021; Lindberg et al., 2015; Miglietta et al., 2004; Ull et al., 2021; Zaga et al., 2019)
Fully conscious patients (Maringelli et al., 2013)
Communication vulnerable patients in intensive care (Johnson et al., 2021; Koszalinski et al., 2019)
Dysarthric ICU-patients (Maringelli et al., 2013)
Lightly sedated mechanically ventilated patients (Karlsen et al., 2022; Noguchi et al., 2019)
Patients with complex communication needs (Finke et al., 2008)
Patients' that are conscious over a longer period during their ICU stay (Holm, Karlsson, et al., 2021)
Phrases used to describe patient population by being dependent on mechanical ventilation
Clients on mechanical ventilator (Rathi & Baskaran, 2014)
Invasive (mechanically) ventilated patients (Salem & Ahmad, 2018; Ull et al., 2021)
Patients being (connected to/undergoing) mechanically ventilated (during critical illness) in intensive care units (Bayog et al., 2020; Danielis et al., 2020; Happ et al., 2014; Happ, Seaman, et al., 2015; Holm et al., 2020; Patak et al., 2004)
Patients requiring artificial ventilation (Wojnicki-Johansson, 2001)
Patients treated with mechanical ventilation (Khalaila et al., 2011)
Tracheostomized patients in intensive care/Patients on tracheostomy receiving mechanical ventilation (Flinterud & Andershed, 2015; Mills et al., 2022; Panadian et al., 2019)
Ventilator dependent patients with tracheostomies (McGrath et al., 2016, 2019)
Ventilator supported individuals (Casbolt, 2002)
Phrases used to describe patient population both by their communication abilities and being dependent on mechanical ventilation
(Adult) Non-sedated (and more awake/mechanically ventilated) ICU patients (Albayram & Yava, 2020; Danielis et al., 2020; Holm & Dreyer, 2018b; Karlsen et al., 2020)
Conscious and alert (voiceless/oriented) patients under mechanical ventilation in intensive care units (Duffy et al., 2018; Holm & Dreyer, 2018b; Holm, Nikolajsen, et al., 2021; Karlsen et al., 2019)
Intubated patients' ability to communicate (Ijssennagger et al., 2018)
Mechanically ventilated patients who are awake and able to communicate (Danielis et al., 2020)
Mechanically ventilated patients who cannot communicate verbally due to endotracheal intubation/tracheostomy (Holm et al., 2020)
Nonspeaking (critically ill/hospitalized) patients treated with mechanical ventilation (in the intensive care unit; Foa et al., 2016; Happ et al., 2011; Happ, Roesch, et al., 2004; Yavuz & Gursoy, 2022)
Nonvocal (ventilated/critical care) patients (Carroll, 2004, 2007; Trotta et al., 2020)
Patient who are voiceless due to mechanical ventilation (Koszalinski et al., 2015)
Unable/able to speak/talk/communicate/verbally express themselves (as result of ventilation, because of their need for mechanical ventilation and respiratory tract intubation (Carroll, 2004; Fitch et al., 1998; Foa et al., 2016; Guttormson et al., 2015; Hosseini et al., 2018; Koszalinski et al., 2015; Magnus & Turkington, 2005; Menzel, 1998; Panadian et al., 2019; Yavuz & Gursoy, 2022)
Ventilated patients (unable to converse in a normal manner (Casbolt, 2002; van den Boogaard & van Grunsven, 2004)

technology. All these factors cause significant distractions, noise and interruptions, which may impede providers' abilities to see and understand the patients' attempts to communicate.

The review of existing knowledge also showed that intensive care patients vary greatly in their abilities to communicate, their needs to communicate and the length of stay. Hence, it is a heterogeneous patient population with the commonality that they are admitted to the ICU, mechanically ventilated and critically ill. Factors like fatigue, delirium, cognitive impairments, poor coordination and muscle weakness are concomitant with being a mechanically ventilated ICU patient. Hence, these factors also affect the communication process in clinical ICU practice. We found a total of 60 relevant concepts used, thematically organized under five overarching categories, which can be seen in Table 2.

The categorization of the core concepts was further illustrated in a conceptual map, as shown in Figure 3. This figure highlights

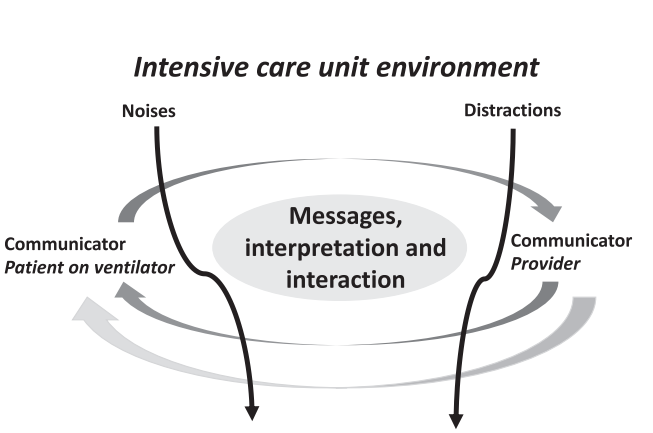

FIGURE 2 Characteristics of provider–patient communication in ICUs.

especially the core components of the identified concepts, 'communication assessment', 'communication styles', 'communication partners', and 'communication methods/strategies'. The core concepts are also linked to each other, as assessment will affect the styles and methods used, and vice versa.

4.3 | Model for communication practice with mechanically ventilated patients

Based on the analysis of core concepts and consensus in the expert group, we were able to develop a model for guiding the communication practice with mechanically ventilated patients, as illustrated in Figure 4.

The outer grey line in the model symbolizes the intensive care unit context, with communication barriers such as noise, technical equipment and the constant, demanding monitoring and assessment of the patients' status. The inner grey line symbolizes overarching theories of patient-centred care, patient involvement and standards for quality in the communication, guiding the providers in their practice. Overarching areas of communication and interaction are illustrated in the inner part of the figure and consist of (1) systematic assessment of communication abilities, (2) communication and interaction in the practice, as well as (3) documentation and evaluation of the communication. These three areas are interconnected to each other as illustrated by the arrows.

5 | DISCUSSION

The aim of this study was to perform a concept analysis and present a model for communication with mechanically ventilated patients in intensive care units. We found a great variety in the concepts used, both to describe the patient population and the communication and interaction between patient and provider. The results also show that communication with mechanically ventilated patients is distinguishable from communication with a vocally communicative person. The question is whether previous theories have guided providers sufficiently in their communication, and if we have developed/achieved an evidence-based practice (Happ, 2021).

Research within healthcare communication generally tends to 'approach it from a pragmatic viewpoint, focusing more on ways to improve communication than on explaining how it works' (Berger et al., 2010). This means that essential components of communication, that is, the process of mutual influence and cognitive-affective factors are neglected (Berger et al., 2010). This is also the case in the ICU setting where the findings of this concept analysis, as well as other previous literature reviews, illustrate how AAC has been presented as a solution to the communication challenges, but also requires both careful consideration and competence (Holm et al., 2020; Rose et al., 2021; Ten Hoorn et al., 2016). However, it has also been thoroughly documented that AAC is not widely used in current practice in ICUs, and the studies applying AAC in intensive care are still limited, with small samples and few randomized, controlled trials (Carruthers et al., 2017; Happ, 2021; Karlsen et al., 2019). The AAC that have been used for other patients with communication barriers may not be as efficient in an ICU context, where it is necessary to continuously assess patients' fluctuating communication skills and cognitive capacity. Several of the reviews performed also highlighted the difficulty of comparing intervention studies, both due to lack of definitions, variety in the interventions and a lack of thorough descriptions of the patient population (Carruthers et al., 2017; Holm et al., 2020; Karlsen et al., 2019; Ten Hoorn et al., 2016).

Moreover, the lack of adequate definitions and vague conceptualizations, may lead to inadequate outcome measures, as represented in the literature (Carruthers et al., 2017). Overall, the inconsistency in definitions and lack of theoretical foundation makes it difficult to understand the actual practice. The use of various concepts may also be due to national and local differences in care and treatment procedures and patient characteristics, as well as a difficulty explaining the phenomena. An important impact of the results from this study can be a common ground to discuss concepts. An example of a rather ambiguous concept is 'effective/ineffective communication'. Is efficiency the same as good or humanizing communication providers strive to achieve, and how can a provider separate effective and ineffective measures in the communication when including a variety of unaided and aided communication methods? Identifying

TABLE 2 Concepts and condensation of core

Communication and interaction with mechanically ventilated patients Concepts related to communication and interaction.	
Concepts	**Condensation of core**
Communication (Albayram & Yava, 2020; Ariffin et al., 2020; Bayog et al., 2020; Carroll, 2004, 2007; Casbolt, 2002; Dithole et al., 2016a, 2016b; Flinterud & Andershed, 2015; Freeman-Sanderson et al., 2016b; Foa et al., 2016; Handberg & Voss, 2018; Holm & Dreyer, 2018a; Holm et al., 2020; Karlsen et al., 2019; Kuyler & Johnson, 2021; Momennasab et al., 2019; Panadian et al., 2019; Pina et al., 2020; Slatore et al., 2012; Ten Hoorn et al., 2016; Wojnicki-Johansson, 2001)	Communication is used to interact and form relationships, in a dyadic process. It is an essential part of living and our social life. The primary channel of conveying information and messages is communication. It involves several types of techniques, such as motoric and cognitive abilities (written, verbal or non-vocal). The patient can express needs, thoughts, preferences, wishes and concerns; the provider can inform, comfort and support the patient as well as assess the patient's status and emotions. Communication is also a central part of person-centred healthcare (to create alliances), a prerequisite for patient involvement, and may also be experienced therapeutic.
Interaction (Bayog et al., 2020; Finke et al., 2008; Happ, 2021; Karlsen et al., 2022; Kuyler & Johnson, 2021; Llenore & Ogle, 1999)	Dialogue and meaning are created through interaction between patients and providers. A relational phenomenon where joint meaning is created. Tend to be task-focused, provider-controlled and mainly associated with physical needs and/or procedures when the patients are critically ill such as in the ICU. Interaction is also affected by patient and provider characteristics.
Communication act or event (Happ et al., 2011, 2014)	A communication act or event is a unit of communication behaviour used for attempts to convey a message.
Communication barrier (Finke et al., 2008; Karlsen et al., 2019; Khalaila et al., 2011; Salem & Ahmad, 2018)	Communication barriers can be caused by both physical and mental abilities of the patients (as well the endotracheal tube), but also healthcare providers abilities to understand and the ICU environment in general. May impact the patients and lead to negative emotions.
Communication breakdown (Magnus & Turkington, 2005; Rathi & Baskaran, 2014; Santiago et al., 2019)	Communication breakdown occurs then either or both partners in a dialogue perceive they have not been able to adequately communicate their needs, wants, intentions or understood their communication partner. Communication breakdown leads to reduced quality in patient care, and access to functional communication. This can impact the patient's treatment and outcome.
Communication exchange (Happ et al., 2011, 2014)	A communication exchange is a cluster of communication acts
Communication quality (Happ, 2021; Happ et al., 2011, 2014)	Communication quality can be defined by positive or negative behaviour between providers and patients.
Dialogic interaction (Kuyler & Johnson, 2021)	Dialogic interaction is mutual engagement, between communication partners and creation of joint meaning during communication. To be efficient there must be established trust, and the communication partners need to be on an equal footing.
Language (Carroll, 2007; Karlsson et al., 2012)	Language is a part of human behaviour. Language is both verbal, non-vocal and written. The essence is the message that is expressed through language.
Non-verbal communication (Dithole et al., 2016a; Yavuz & Gursoy, 2022)	Non-verbal communication is gestural and physical communication. Includes facial expression or other muscle movement intended to communicate message.
Patient-centered care (Choi & Tate, 2021; Slatore et al., 2012)	Patient centred care is essential in ICUs both as a philosophy and to preserve patient's personhood.
Shared decision-making (Karlsen et al., 2020)	Shared decision making is a collaborative process between patients, providers and surrogate decision-makers when making healthcare decisions.
Voicelessness (Ariffin et al., 2020; Carroll, 2007; Happ, 2000, 2021; Holm & Dreyer, 2018a; Koszalinski et al., 2015; Tembo et al., 2015)	Voicelessness is the loss of voice and thus the ability to communicate vocally. It impacts personhood and interaction with others. It may create negative emotions such as powerlessness or lack of control and contribute to dehumanization.
Communication assessment (Bayog et al., 2020; Happ, 2021; Holm & Dreyer, 2018a) Assessment of communication skills is a prerequisite for efficient use of communication tools and strategies. It Includes cognitive, mental and physical abilities, as well as level of consciousness, language, mode of intubation and hearing/vision.	

(Continues)

TABLE 2 (Continued)

Concepts	Condensation of core
Attention-seeking actions (Karlsen et al., 2019)	Attention-seeking attentions are efforts made to achieve joint attention and understanding from patients
Basic communication criteria (Happ, 2021; Holm & Dreyer, 2018b)	Basic communication criteria are linked to both physical, sensory and cognitive abilities of the person to communicate coherently.
Communication ability/inability (Ijssennagger et al., 2018; Foa et al., 2016; Freeman-Sanderson et al., 2019; Happ, 2021; Ju et al., 2021; Karlsen et al., 2019; Pina et al., 2020; Sutt et al., 2015)	The ability to communicate is defined by a successful message transmission and interpretation. The inability to communicate may lead to failed communication and negative outcomes. It is affected by physical, sensory, cognitive and environmental factors.
Communication difficulties/challenges/problems (Bayog et al., 2020; Carroll, 2004, 2007; Choi & Tate, 2021; El-Soussi et al., 2015; Happ, 2021; Happ, Tuite, et al., 2004; Holm & Dreyer, 2018a; Jansson et al., 2019; Khalaila et al., 2011; Llenore & Ogle, 1999; Menzel, 1998; Patak et al., 2004; Tembo et al., 2015; Tolotti et al., 2018)	Communication difficulties is a common phenomenon among mechanically ventilated patients. It is mainly caused by the intubation, and the patient characteristics (cognitive, sensory or language deficits, fatigue and/or reduced consciousness and muscle strength). Can result in poor establishment of meaningful relationships with providers and family, affect treatment and create negative emotions and psychological distress for the patient.
Communication disability (Happ, Sereika, et al., 2015)	Communication disability includes existing and acquired communication impairments while being ventilated. Is mostly caused by the tube when the patients is intubated, requires assessment and accommodation from providers.
Communication needs (Fitch et al., 1998; Jansson et al., 2019; Holm & Dreyer, 2018b; Mobasheri et al., 2016)	Communication needs are multi-dimensional and include physical, social, emotional and psychological aspects. Can alter depending on the patient's illness trajectory
Communication skills (Finke et al., 2008; Holm et al., 2020)	Adequate skills in communication are important in the interaction between patients and providers, to be able to understand each other efficiently.
Duration of talk (Nilsen et al., 2014)	Duration of talk is time spent communicating (verbally).
Failed communication (Guttormson et al., 2015; Holm et al., 2020)	The inability to successfully communicate and deliver messages between communication partners may lead to failed communication. This can impact patients' well-being, safety and comfort
Frequency (Happ et al., 2011)	Frequency is the number of exchanges per session of communication.
Giving up attempts to communicate (Karlsen et al., 2020)	Patients and providers may give up on their attempts to communicate. Can be caused by multiple experiences of failed communication.
Severe communication impairment (Finke et al., 2008)	Severe communication impairment is a temporary or permanently reduced ability to communicate.
Quality of phonation (McGrath et al., 2016, 2019)	Quality of phonation is the measurement of quality of the patient's voice sound.
Communication methods/strategies (Bayog et al., 2020; Finke et al., 2008; Happ, 2021; Khalaila et al., 2011; Kuyler & Johnson, 2021; Patak et al., 2004) Communication methods or strategies (or techniques) can be unaided (use of the body for communication) or aided (use of writing or tools). It can also be attention enhancing from the providers perspective by the use of eye contact, establishment of a communication friendly environment, waiting/pausing to give the patient time to express themselves, establishment of the patient's yes/no signalling, assessment of the patient's mode of communication etc.	
Concepts	**Condensation of core**
Above cuff vocalization (McGrath et al., 2016, 2019; Mills et al., 2022; Petosic et al., 2021)	Above cuff vocalization is a method to facilitate vocal speech, applying a flow of air via the subglottic port of a tracheostomy tube. The quality of the voice sound varies depending on each patients' abilities.
Aided communication (Rose et al. 2021)	Options for aided communication include non-vocal aids, that is visual-based augmentative and alternative communication aids including writing equipment, communication boards or digital apps that convey symptoms and basic needs without generating speech. Other non-vocal sound-based augmentative and alternative communication aids include speech-generating aids that generate static and dynamic digitized sound such as voice output communication aids (VOCA), speech-generating software and eye gaze technology. Another speech-generating option is the electrolarynx, a device that generates sound (not voice) via transmission of vibration through soft tissue, which is recognizable as speech with movement of the lips, tongue and jaw (articulators).

TABLE 2 (Continued)

Alternative strategies (Johnson et al., 2021)	Alternative strategies for communication can include interpretation of non-vocal signals or using communication aids of different types.
Augmentative and alternative communication (Bayog et al., 2020; Carruthers et al., 2017; Choi & Tate, 2021; El-Soussi et al., 2015; Finke et al., 2008; Foa et al., 2016; Freeman-Sanderson et al., 2019; Garry et al., 2016; Handberg & Voss, 2018; Happ, Roesch, et al., 2004; Happ, Seaman, et al., 2015; Happ, 2021; Holm & Dreyer, 2018b; Holm et al., 2020; Holm, Karlsson, et al., 2021; Hurtig & Downey, 2008; Istanboulian et al., 2020; Jansson et al., 2019; Kuyler & Johnson, 2021; Maringelli et al., 2013; Mobasheri et al., 2016; Modrykamien, 2019; Pina et al., 2020; Rose et al., 2021; Salem & Ahmad, 2018; Ten Hoorn et al., 2016; Ull et al., 2021)	AAC is all types of aided or unaided methods or strategies used to supplement vocal, non-vocal and verbal skills with the aim to aid comprehension. AAC can take the form of various forms of communication, such as: speech, text, gestures, sign language, symbols, images, electronic speech-generating devices, among others. There is a great diversity of AAC methods and tools, which must be adapted to the needs and characteristics of the people to whom they are applied.
Communication aid (Karlsen et al., 2019; Rathi & Baskaran, 2014)	Communication aids are tools that may enable communication for some patients.
Communication board (Grossbach et al., 2011; Otuzoğlu & Karahan, 2013; Patak et al., 2006; Rathi & Baskaran, 2014; Rose et al., 2021)	A basic, non-vocal visual augmentative and alternative communication aid. Can exist in different types, such a magic slate board, magnetic plastic boards, or a simple writing board and include letters, words, or pictures describing basic needs, bodily functions or names of people. Can enhance the patient's possibility to express themselves and thereby improve the quality of care.
Communication cards (Albayram & Yava, 2020; Rose et al., 2021)	Basic, non-vocal, visual augmentative and alternative communication aid comprised by either letters, words, or pictures. Used to facilitate patients' communication of needs and emotions.
Electronic voice output communication aids (Happ, Roesch, et al., 2004; Koszalinski et al., 2015; Maringelli et al., 2013; Modrykamien, 2019)	Electronic voice output communication aids are devices that produce either prerecorded, digitalized voice messages or synthesized speech with the aim to deliver a message to a communication partner.
Eye-tracking devices (Duffy et al., 2018; Garry et al., 2016; Maringelli et al., 2013)	Eye-tracking devices detect eye movements to enable communication through the patients' eyes.
Eye-gaze technology (Rose et al., 2021)	Eye-gaze technology uses technical solutions to determine eye position and gaze point, by gaze dwelling on text or symbols people can then generate speech.
Fenestrated tracheostomy tube (Panadian et al., 2019)	Fenestrated tracheostomy tubes restore and permit phonation allowing the air to enter from the tracheostomy tube into the subglottic area, towards the larynx.
In-line speaking valve (Sutt et al., 2015)	In line speaking valve blocks airflow redirecting it through the upper airways enabling functional use of the glottis to produce verbal communication in a tracheostomized patient.
One-way speaking valve (O'Connor et al., 2018; Panadian et al., 2019)	One-way speaking valve produces speech by airflow through the vocal cords allowing phonation.
Speaking tracheostomy tube (Leder et al., 2013)	Speaking tracheostomy tube permits the tracheostomy tube cuff to remain inflated. Air flows from an external source, into an airline on the outer cannula and exists through an opening superior to the cuff.
Voice restorative strategies (Istanboulian et al., 2020)	Voice restorative strategies can include use of various devices, some requiring cuff deflation and others not.
Communication partners To create joint, meaningful communication and interaction, the relationship with the patient is essential and providers function as communication partners that can facilitate these processes through their dialogue.	
Concepts	**Condensation of core**
Communication gatekeepers (Holm & Dreyer, 2018a, Holm et al., 2020; Patak et al., 2004)	The communication gatekeepers (providers) often hold the power of communication (regarding the content, duration and methods of communication) because of the patients reduced communication abilities.
Establishment of relationship (Wojnicki-Johanson, 2001)	Establishment of a relationship and collaboration with the patient, including functional communication, is a prerequisite for effective nursing.

(Continues)

TABLE 2 (Continued)

Communicative participation (Laakso et al., 2009)	Communicative participation is involvement in interaction/situations by the means of communication methods in various ways.
Interpersonal communication (Handberg & Voss, 2018; Karlsson et al., 2012; Modrykamien, 2019)	Interpersonal communication is communication between humans either by non-vocal or verbal communication, embedded in everyday interaction. It can be both positive or negative, building bonds or destroying relationships.
Joint attention (Karlsen et al., 2019)	Joint attention essential in interaction between two communication partners and exist when both communication partners acknowledge that there is a mutual attention.
Nurse–patient communication (Ariffin et al., 2020; Bayog et al., 2020; Dithole et al., 2016a; Happ, 2021; Holm & Dreyer, 2018a; Holm et al., 2020; Jansson et al., 2019)	Nurse–patient communication is a relationship build to form meaning making interaction, with a personal touch, as well as ensuring continuity of care and social encounters. It can be either by verbal or non-vocal methods, and includes a personal approach, engagement and meaning making. Communication is the essence of the relationship between the nurse and the patient.
Patient directives (Finke et al., 2008; Happ, 2000; Holm & Dreyer, 2018a)	Patient directives are attempts to communicate which can reveal patient preferences. It can be both non-verbal and written and involves interpretation from the providers or families.
Patient initiation (Happ et al., 2011)	Initiation /opening /induction of communication by patients by any form of communicative signals.
Communication styles	
Communication styles are different approaches to express thoughts, feelings and opinions in interaction with other people. In professional settings, such as healthcare, a communication style can also have a specific purpose, especially related to increate well-being and health.	
Concepts	**Condensation of core**
Caring/non-caring communication (Karlsson et al., 2012)	Caring communication is when the patient experiences being understood, can express emotions and feels connected, involved and secure. Non-caring communication occurs when providers are neglectful and/or absent.
Effective/ineffective communication (Ariffin et al., 2020; Bayog et al., 2020; Carroll, 2004, 2007; Carruthers et al., 2017; Choi & Tate, 2021; Dithole et al., 2016a; El-Soussi et al., 2015; Finke et al., 2008; Fitch et al., 1998; Freeman-Sanderson et al., 2019; Garry et al., 2016; Guttormson et al., 2015; Ju et al., 2021; Khalalia et al., 2011; Leung et al., 2017; Modrykamien, 2019; Momennasab et al., 2019; Otuzoğlu & Karahan, 2013; Rathi & Baskaran, 2014; Salem & Ahmad, 2018; Wojincki-Johansen, 2001; Yavuz & Gursoy, 2022)	Effective communication is dependent on two individual and environmental factors and occurs when both the sender and receiver of messages achieve shared meaning and understanding. Effective communication can help patients cope with their situation and improve patient outcomes and wellbeing. It is also a quality indicator in healthcare and the foundation of patient-centred care. Ineffective communication is when the communication is not fully understood by either or one of the communication partners, or communications attempts are not acknowledged. It can also occur when one of the communication partners use inadequate communication methods. Ineffective communication can lead to negative emotions/psychological outcomes for the patient, decreased patient satisfaction and reduced quality of care.
Good/poor communication (Casbolt, 2002; Karlsen et al., 2022; Laakso et al., 2009)	Good and positive communication involves behaviours that facilitate understanding and meaningful interaction between the partners. It is involving and may be therapeutic. Poor communication involves behaviours that do not facilitate understanding and response by the partner. It has proven to be one of the main causes of psychological problems faced by patients after an ICU stay, an upsetting experience that can hinder recovery.
Health-related decision making (Happ et al., 2007)	Health related decision making is related to choices in treatment.
Humanizing/dehumanizing communication (Bayog et al., 2020; Carrol, 2007; Kvande et al., 2021)	Humanization is created through interaction and communication among fellow human beings. To achieve humanizing communication providers must have appropriate training, since focus on machines and procedures in the interaction in the ICU rather than the human being can be experienced as dehumanization.
Micro-decisions (Karlsen et al., 2020)	Micro decisions are small scale decisions “every day” made at the patient's bedside.

TABLE 2 (Continued)

Patient involvement (Happ et al., 2007; Olding et al., 2016)	Patient involvement is inclusion by providers but also recognition of patient's expressions and desire for involvement or prior statements of preference. May enhance the patient's feeling of being in control of the situation.
Successful/unsuccessful communication (Carroll, 2004; Flinterud & Andershed, 2015; Jansson et al., 2019)	Successful communication is when the communication partners understand each other's communication methods and needs. Successful communication plays a key role in the well-being of critically ill patients, using aids, caring environment and understanding contributing to recovery. Unsuccessful communication is the opposite of successful communication where there is a lack of understanding appropriate methods of communication or needs. This may lead to misunderstandings, or feelings of not being understood.

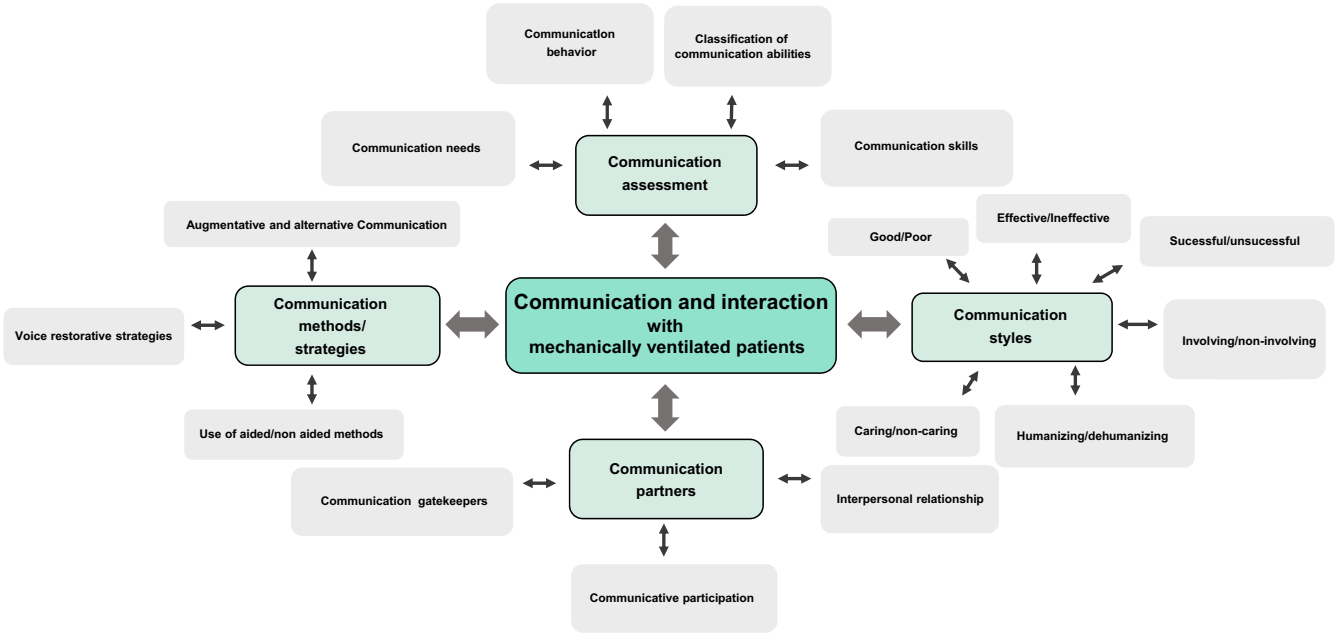

FIGURE 3 Conceptual map

indicators that distinguish between good and poor communication can therefore be a challenge for providers in patient care, although this is an important part of their practice. Laakso et al. (2009, p. 154) identified poor communication as 'one of the main causes for psychological problems faced by patients after an ICU stay, an upsetting experience that can hinder recovery'. In a communication intervention study, Happ et al. (2014) used pre-established for distinguishing between positive and negative nurse communication behaviour, such as acknowledging and augmenting communication using appropriate techniques, ignoring patients' attempts to communicate and not establishing contact with the patient through either verbal means or eye contact. Communication acts from providers can reduce or enhance the quality of communication; however, the communication between patients and providers in ICUs has been previously described as a movement between frustration and comprehension, and is a challenge not only for the patients but also the providers (Holm & Dreyer, 2018a). Communication is complex, and good/poor communication practices can also be linked to processes over time, lack of competency, organizational factors such as lack of appropriate resources (both physical presence of AAC or staff), or even miscommunication between providers.

To increase the clinical relevance of the model and the concept analysis results, exemplification of communication styles might be useful in a more narrative style in future theoretical development but might require more observational research. The concept analysis may also provide valuable insight into the complexity of communication in healthcare. Theories on communication in healthcare often tend to focus on the interaction between patient and provider using verbal language (since most patients do have the ability to speak), and how patients can receive adequate healthcare, improve their health and cope with illness by verbalizing their needs, preferences and thoughts (The routledge handbook of health communication, 2021).

Im and Meleis (2021) argue that concepts which have not previously been considered relevant can evolve into important concepts in future nursing. The different treatment approaches in ICUs (ABCD[E]; eCASH, analgosedation, humanizing ICUs) have many of the same core values and have interestingly appeared without (yet) any attempt of linkage between them (Balas et al., 2012; Devlin

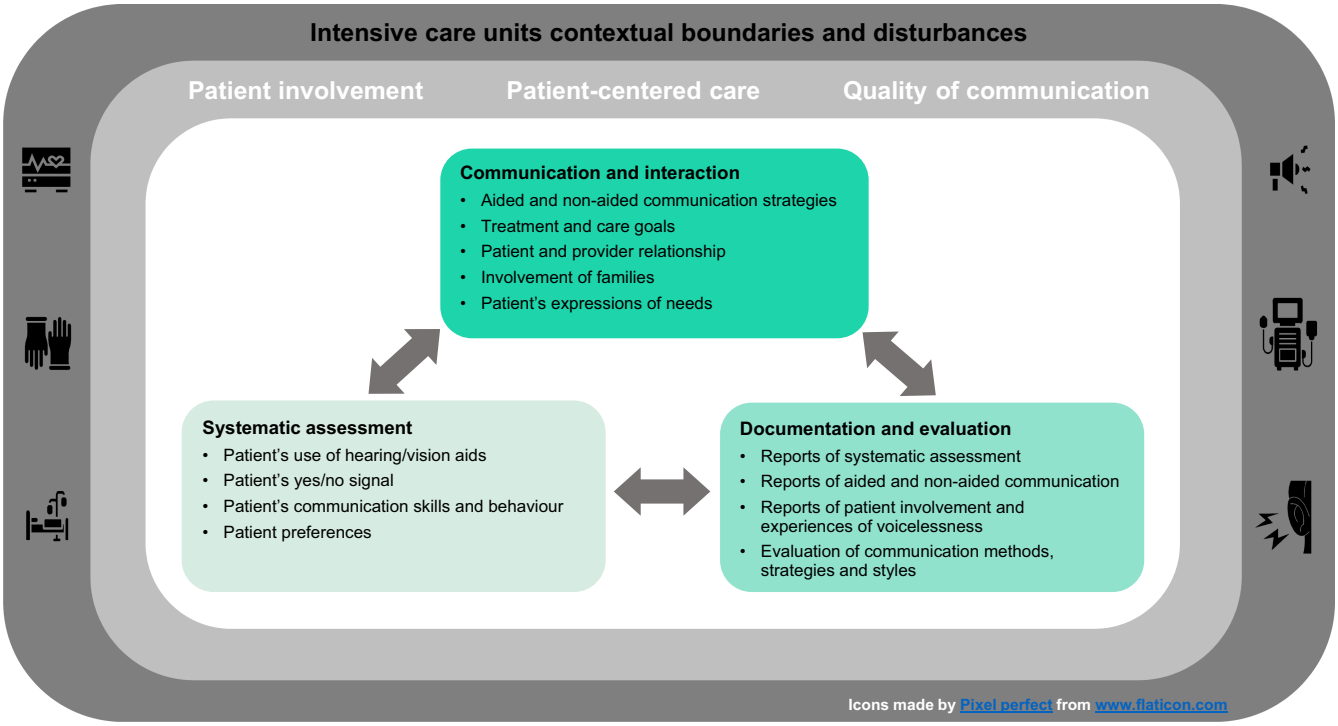

FIGURE 4 Communication between providers and mechanically ventilated patients

et al., 2018; Velasco Bueno & La Calle, 2020; Vincent et al., 2016). These approaches almost ignore, or at least gloss over, the communication challenges that arise but are clearly inspired by person-centred care emphasizing communication as an important task for providers. The communication challenges will also affect all providers working in ICUs but are especially relevant to nurses who are always bedside. Cheraghi et al. (2017) present in their figure of patient-centred care, processes of four steps that are necessary to quality improvement; patient acceptance, assessment, identification and understanding of patient empowerment. Our model (Figure 4) is process-related but also addresses the necessity to document and evaluate the communication approaches. Providers have a unique responsibility to facilitate the processes of communication and interaction to empower the patients, as these patients are both critically ill and voiceless. The model also points to core areas in which quality can be assessed as part of quality improvement projects or research in the future.

5.1 | Strengths and limitations

Concepts are building blocks of a theory, but lack of clearly defined or presence of competing concepts can limit our understanding and ability to grasp the phenomena. The concepts and terms found may only be a partial description and changeable with time (Bergdahl & Berterö, 2016; Im & Meleis, 2021). Incorporating descriptions of concepts from both quantitative and qualitative research aimed to ensure a comprehensive view of the phenomena; however, most of the literature identified used qualitative measures which might limit our understanding (Im & Meleis, 2021). The expert panel had extensive experience but consisted solely of nurses. This might have biased our perspectives on the findings. The methodological approach included literature from other healthcare providers in the analysis, specifically speech-language pathology and communication disorders science. We are planning to test and refine the model with other healthcare professionals in the future.

Frequent dialogue occurred among the international expert panel, which had extensive knowledge about the topic and familiarity with the scientific literature in the field but also in clinical practice, research and education (Elo & Kyngäs, 2008), was a strength. Two authors separately reviewed the literature, the terminology and the concept analysis to ensure trustworthiness and credibility.

The core concepts are synthesized from a broad range of international literature which also strengthens the findings generalizability and transferability to various ICU contexts. In the process of selecting literature to comprise the concept analysis, focusing on literature from the last two decades may have left out a substantial work of pioneers from this area. However, it was important to relate the concepts to today's ICU context, and therefore necessary to use updated literature (Devlin et al., 2018; Im & Meleis, 2021).

6 | CONCLUSION

The concept analysis has outlined the most common core concepts of communication with mechanically ventilated patients in intensive care units, which is illustrated in the conceptual map as

communication and interaction with mechanically ventilated patients, communication assessment, communication styles, communication partners and communication methods/strategies. By highlighting different perspectives of the communication and interaction between conscious, mechanically ventilated patients and care providers, we have developed a model to guide a deeper understanding of the phenomena. The findings of the concept analysis can be used in direct clinical practice and for research and quality improvement purposes but can also require further testing. The model is still evolving and will be tested and refined in the future, and may also be a basis for quality improvement projects and further development within research. The goal is to create a theory of communication with mechanically ventilated patients in intensive care which includes a practical model to guide providers in their clinical practice and incorporate examples of best practices. This could also include the facilitation of interventions directed to improve communication from speech language pathologists, occupational therapists, physicians or other providers with treatment responsibility in the ICU-setting.

AUTHORS' CONTRIBUTIONS

MMWK, AH, MEK, LGH, JAT, PD, MBH: made substantial contributions to conception and design, or acquisition of data, or analysis and interpretation of data; MMWK, AH, MEK, LGH, JAT, PD, MBH: involved in drafting the manuscript or revising it critically for important intellectual content; MMWK, AH, MEK, LGH, JAT, PD, MBH: given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; MMWK, AH, MEK, LGH, JAT, PD, MBH: agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All authors have agreed on the final version and meet at least one of the following criteria (recommended by the ICMJE*):

1. substantial contributions to conception and design, acquisition of data or analysis and interpretation of data;
2. drafting the article or revising it critically for important intellectual content.

*http://www.icmje.org/recommendations/

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No conflict of interest has been declared by the authors.

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DATA AVAILABILITY STATEMENT

Data sharing is not applicable to this article as no new data were created or analyzed in this study.

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SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

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