Intensive & Critical Care Nursing 51 (2019) 64–72

Contents lists available at ScienceDirect

Intensive & Critical Care Nursing

journal homepage: www.elsevier.com/iccn

Research article

Promoting a nursing team's ability to notice intent to communicate in lightly sedated mechanically ventilated patients in an intensive care unit: An action research study

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ARTICLE INFO

Article history:
Accepted 29 October 2018

Keywords:
Communication
Critical care nursing
Intensive care unit
Light sedation
Mechanical ventilation
Action research
Patient dignity

ABSTRACT

Objectives: This study aimed to examine changes in the practice of nurses who received an intervention designed to increase their awareness of endotracheally intubated, lightly sedated mechanically ventilated patients' intent to communicate.
Research methodology: Action research was applied. Specifically, three interventions promoting awareness of patients' intent to communicate were administered and pre- and post-intervention, observations of patient-nurse interactions, unstructured interviews with nurses and a patients' satisfaction survey were conducted. The pre- and post-intervention patient-nurse interactions and patients' survey results were then compared and a content analysis of the interviews and field notes was performed.
Setting: The intensive care unit of a university hospital.
Main outcome measure: Nurses' awareness of lightly sedated mechanically ventilated patients' intent to communicate.
Findings: After the intervention, the incidence-rate ratios for nurses noticing of patients' intent to communicate were 1.53; there was no change in the frequency of patients' intent to communicate. Further, nurses became more aware of and reflected on their own practices, showed increased interest in co-workers' practices and considered their actions from patients' perspectives. Patients' satisfaction with nurses' respect for their wishes and dignity also increased.
Conclusions: Action research can induce a change in intensive-care-unit-based nursing practice towards patient-centred care.

Implications for clinical practice

- Interventions based on action research can improve intensive care unit nurses' awareness of lightly sedated mechanically ventilated patients' intent to communicate.
- These interventions can encourage nurses to consider care from patients' perspectives and nursing teams to adopt patient-centred care.
- Changes in nurses' behaviour as a result of the intervention may increase lightly sedated patients' satisfaction and nurses' respect for patients' dignity.
- Intenisve care nurses should give lightly sedated patients opportunities to initiate communication.

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https://doi.org/10.1016/j.iccn.2018.10.006
0964-3397/

Introduction

In intensive care units (ICUs), severely ill patients who are under mechanical ventilation (MV) have traditionally been administered heavy sedation to alleviate the associated pain and discomfort. Recently, however, it has been recommended that light sedation be used in such cases, as this can lessen the risk of adverse effects associated with excessive use of sedatives (Balas et al., 2012; Balas et al., 2018). Maintaining patients' cognitive functions by decreasing their degree of sedation facilitates early mobilisation and allows even endotracheally intubated MV patients to communicate through writing (Barr et al., 2013; Vincent et al., 2016).

Several studies have consulted with MV patients post extubation, consequently clarifying their experiences while under MV (Engström et al., 2013; Samuelson, 2011; Karlsson et al., 2012a). In particular, the patients reported experiencing anxiety, fear, loneliness and physical suffering, as they were dependent on healthcare professionals and did not have access to sufficient means of communication (Baumgarten and Poulsen, 2015; Cutler et al., 2013; Fink et al., 2015; Finke et al., 2008; Guttormson et al., 2015; Tembo et al., 2015). One limitation to these studies is that 33–57% of those approached did not remember their experience in the ICU (Myhren et al., 2009; Rotondi et al., 2002). However, with the current practice of using less sedation, real-time surveys of endotracheally intubated patients have become possible; lightly sedated mechanically ventilated (LSMV) patients have demonstrated that they can interact with their surroundings even while in a critical condition, physically dysfunctional and dependent on technology (Laerkner et al., 2017; Noguchi and Inoue, 2016; Prime et al., 2016). As a consequence, it has been found that LSMV patients desire to remain conscious and to be able to maintain their self-image by communicating with others; in fact, they reported a willingness to experience pain in order to maintain consciousness and communication abilities (Noguchi and Inoue, 2016; Prime et al., 2016). However, the patients also reported that they generally did not receive opportunities to initiate communication and were ignored when they attempted to communicate (Karlsson et al., 2012b,c; Samuelson, 2011). Further, they revealed that they experienced existential suffering as a result of their unidirectional communication with medical personnel (Holm and Dreyer, 2017; Noguchi and Inoue, 2016).

Until recently, communication between MV patients and nurses was brief, lasting approximately one minute (Ashworth, 1980), during which the nurse spoke for approximately 35 seconds (Nilsen et al., 2013) and initiated most of the exchanges (Happ et al., 2011). ICU nurses prioritise reducing patients' burden and emphasise efficient, task-oriented methods of communication; with MV patients, ICU nurses control the timing of such communication, the topics covered and the communication methods (Bergbom-Engberg and Haljamäe, 1993; Hall, 1996; Happ et al., 2011; Nilsen et al., 2013). Thus, to enable LSMV patients to appropriately influence these exchanges and to ensure that their human dignity is respected, changes in practice that support two-way communication are needed.

In the present study, action research (AR) is employed, involving the application of an intervention designed to encourage nurses to develop greater awareness of LSMV patients' desire to communicate. The specific goal was to effect changes in nurses' practice that would result in greater respect for the human dignity of LSMV patients in ICUs. This AR emphasised the initiative of both parties (nurses and patients), focusing on specific events in a specific setting, and aimed to foster improvements in the current situation while also obtaining and considering the perspectives of both parties (nurses and patients); this method is based on the social process of collaborative learning (Chenail et al., 2010; Cooper, 2000; Greenwood, 1999; Kemmis, 2007; Kemmis and McTaggart, 2005). Further, situated learning, which involves a more active approach than traditional systematic or passive learning, was set as the theoretical foundation of this study; this entailed the nurses improving their care practices through active participation in the daily practices (Lave and Wenger, 1991).

Methods

Design

AR was implemented in an attempt to directly change nurses' on-site practice. We conducted an intervention to encourage ICU nurses to notice LSMV patients' intent to communicate. In order to identify consequent changes in various aspects, a mixed-methods approach was adopted and qualitative and quantitative data were collected using triangulation. Interviews with nurses and continual participation observation was performed to monitor and measure the trajectory of the changes in the nurses' practice. Interactions between the LSMV patients and the nurses were measured pre and post intervention, and findings regarding the nurses' change in practice were complemented using quantitative data. Furthermore, in order to grasp the influence the changes in nursing practice had on patients, LSMV patients' satisfaction was measured. These obtained quantitative and qualitative data were integrated to multilaterally measure the changes in practice. Fig. 1 outlines the study's procedures and timeline.

All data collection and intervention fieldwork were conducted by the first author, who was a certified critical care nursing specialist (CCNS) with 15 years' experience in this field and an expert in qualitative research. Although the researchers were focussed on a specific issue, they were careful to avoid recommending or discouraging specific actions.

Setting

Our study was performed between April 2016 and October 2017 in the ICU of a Japanese university hospital containing 1065 beds (six of which were in the ICU). The nurse-to-patient ratio in the ICU during the day shift was 1:1.

Participants

Sample of nurses

The purpose of the AR was to induce change in the field; therefore, nurses who wished to improve patient care and who were authorised to autonomously perform all ICU duties were invited to participate in this research.

Patient sample

The inclusion criteria for patients were: aged $\geq$20 years; capable of reporting memories of communicative experiences with ICU nurses during intubation and MV and being (at the time of the study) in a stable condition in the general ward. Patients with suspected cognitive impairments were excluded.

Intervention

The intervention comprised three components. These were developed based on existing research and the AR process.

Providing knowledge

First, existing evidence was provided. Based on the literature review conducted by the principal researcher, information concerning skills for communicating with MV patients (Happ, 2013)

and the subjective experiences of LSMV patients (Noguchi and Inoue, 2016) was provided to the nurses. The presentation comprised a slideshow of photographs of an actual LSMV patient walking and communicating using a writing tool. These sessions were provided to groups of three to six nurses and lasted approximately 10 minutes; they were held while the nurses were on duty or immediately after their shifts.

Feedback on current practice

To raise awareness of the nurses' own practices, the results of the pre-intervention data were provided to the nurses, which served to highlight the current status of the on-site practice in the ICU. This feedback was provided over approximately 10 minutes, and dialogue between the nurses and researcher was encouraged. The nurses' reactions were recorded in field notes.

Nurse action: one-minute observation comprising 'practical epoché'

To promote awareness of patients' intent to communicate, each nurse was asked to engage in patient observation (watching) for one minute during their day shift. The nurse could choose their start time, and the researcher gave them the following instruction: 'Please stop all work for one minute and observe the patient, paying attention to the patient's concerns'.

This nurse-action section of the intervention was based on Husserlian 'phenomenology', a theory that it is possible to determine one's own 'intentionality' by becoming consciously aware of it. Husserl called this attitude 'epoché'; a particular type of attitude is a 'thematic epoché', which relates to when all other 'intentionality' is disregarded, and one is conscious only of a single specific intentionality (Husserl, 1929). Baseline data revealed that the nurses subconsciously noticed patients' communication intent; thus, a 'thematic epoché' to be practised by nurses (the one-minute observation) was established and referred to in this study as the 'practical epoché'.

After this observation, the nurses were briefly interviewed, being asked to freely share their opinions.

Data collection

Survey of nurses

To assess the experimental process and outcomes, for each nurse a patient-nurse interaction observation and an unstructured interview were conducted. The purpose of the interview was to capture the trajectory of the changes in the nurses' practice, as well as the issues that interested the nurses; thus, the interview was not limited to the specific topics that interested the researchers. Therefore, an unstructured interview method was used. Data collection commenced four months before the intervention began and continued for four months after the intervention.

Observation of patient-nurse interactions. Observations of nurses' care for LSMV patients were conducted during day shifts. The Richmond Agitation-Sedation Scale (Sessler et al., 2002) was used to determine patients' level of sedation, with a score of 0 (alert and calm) or −1 (responsive to voice) corresponding to light sedation. In particular, the observations of the patient-nurse interactions focused on how frequently nurses noticed patients' communication intent, how often nurses understood the patients after noticing their intent to communicate, how frequently patients displayed intent to communicate; the number of nurse-initiated conversations; the total number of interactions; and the number of interactions in which nurses and patients reached an understanding. Gesturing to the nurse, making eye contact, using the nurse-call button, ringing a bell or making a sound were considered signs that a patient had an intent to communicate. Additionally, head nodding, gestures, and verbal responses were considered to indicate nurses' awareness of patients' communication intent and their understanding of the patient. Finally, how often nurses gave patients a nurse-call button or writing instrument was also observed.

To ensure the consistency of the data collection and its standardisation, an observation checklist developed through a pre-test observation of patient-nurse interactions was used.

Unstructured interviews with nurses. For each nurse, after they had been observed during the day shift, a private, unstructured interview was conducted with them. The interview began with 'please tell me, in your own words, about your practice for LSMV patients' and all interviews were audio-recorded and later transcribed. These short, unstructured interviews were conducted following the practical epochés.

Field notes. To gain an understanding of the contexts in which the nurses began to change their practices, as much participation observation as possible was conducted throughout the research period (in addition to the observations of the nurse-patient interactions pre and post intervention). Field notes were continuously recorded regarding the conversations and the behaviours of nurses and other staff. These data were used to complement the description of the findings.

Patient survey

A patient-satisfaction survey was conducted through face-to-face interviews with patients in the general ward who fulfilled the inclusion criteria. There were three items in the survey, to which the patients responded using a visual analogue scale (VAS; Voutilainen et al., 2016). This scale comprised a line that was labelled 'strongly disagree' at one end and 'strongly agree' at the other; for each item, patients placed a mark on the line corresponding to how much they agreed/disagreed with the statement. We asked patients to recall specific episodes about each before responding using the VAS. Specifically, the three items were: 1) 'when you wanted to communicate with an ICU nurse, the nurse noticed this and responded'; 2) 'nurses in the ICU seemed to be consistently aware of your presence and consciousness' and 3) 'the nurses in the ICU respected your wishes and dignity when you tried to communicate with them'. Three questions were identified based on prior studies of the subjective experiences of LSMV patients. These were developed with the assistance of experts on psychometric scales, experts in investigations involving the use of VASs for ICU patients and with the advice of CCNSs and former patients with memory of intubation in ICUs. Pre-tests were conducted on 20 patients who had been discharged from the ICU in order to ensure the questions' clarity.

Ethical approval

The study was conducted in accordance with the Code of Ethics of the World Medical Association for experiments involving humans and was approved by the institutional review boards of both the university hospital where the study was conducted and the university with which the first author was affiliated. Consent to participate was obtained from both the patients and nurses, and they were assured of their right to decline or cease participation at any time. Regarding observations in the ICU, participants were informed by the posting of the written research implementation plan in the corridor through which patients and their families are admitted to ICU, which allowed the patients to opt out, if they wished. For the observation of patient-nurse interactions and application of the practical epochés, underage patients and patients with suspected cognitive impairments were excluded. Prior to the commencement of the observation, the principal

researcher obtained verbal consent from patients and also from family members who were present during the observation. For interviews conducted during nurses' shifts, assistance from other nurses was obtained as necessary.

Data analysis

The following data were obtained to grasp the entire scope of the changes in the nurses' practice: patient-nurse interactions constituted objective data, the unstructured interviews constituted subjective and intersubjective data, and the field notes and patient-satisfaction surveys constituted intersubjective data.

Further, the unstructured interview data, as subjective and intersubjective data and the field notes, as intersubjective data, were integrated.

Statistical analysis

The pre- and post-intervention data regarding the patient-nurse interactions and the data from the patient-satisfaction VAS were analysed statistically. Mixed-effects Poisson regression was used to construct models estimating the incidence rate ratio (IRR) of patient-nurse interactions before and after the intervention. All observed items were used as variables. The total observation time varied between nurses, so each variable was entered into the analysis as the number of observations divided by the total observation time. Since data were collected multiple times from each nurse before and after the intervention, nurse ID was entered as a random effect.

Patient satisfaction with each nurse pre and post intervention was compared. Patients who had been treated in the ICU before the completion of the intervention were set as the baseline group; meanwhile, patients who received treatment afterwards were set as the post-intervention group. Since patient data were collected at a single time, the two groups were compared using Wilcoxon's rank sum test.

All analyses were conducted using JMP® Pro 12 (SAS Institute Inc., Cary, NC, USA) statistical software. The significance level was $p < .05$ with a 95% CI.

Qualitative data analysis

Interview data were analysed using the qualitative content analysis process described by Elo and Kyngäs (2008), which includes open coding, categorisation, and abstraction. First, to clarify the current nursing practices for LSMV patients, pre-intervention data were analysed using inductive content analysis. An understanding of the context was obtained by repeatedly reading the interviews and field notes; units of meanings were coded, then grouped based on content, and categories were created. The principal researcher identified initial coding, categories and themes and regularly met with the second author to discuss the analysis. While proceeding with the category-abstraction process, the categories were shared with the nurses; categories were further validated through the comments recorded in the feedback sessions of the intervention. Next, to identify internal changes in the nurses, the post-intervention data were identically analysed. Similarities and differences between the two datasets were then identified using deductive content analysis. Further categories were created, returning to the data as appropriate. By continuing the category-abstraction process through inductive content analysis, the theme of internal change experienced by the nurses was developed. The qualitative analysis was critiqued by experts, including three CCNSs and faculty members specialising in critical care and clinical education. The interactions with the data were also challenged on a continuous and reflective basis.

Findings

Survey of nurses

Changes in patient-nurse interactions

Of the 22 nurses on site, at the time of the commencement of the study 18 were authorised to autonomously perform all ICU

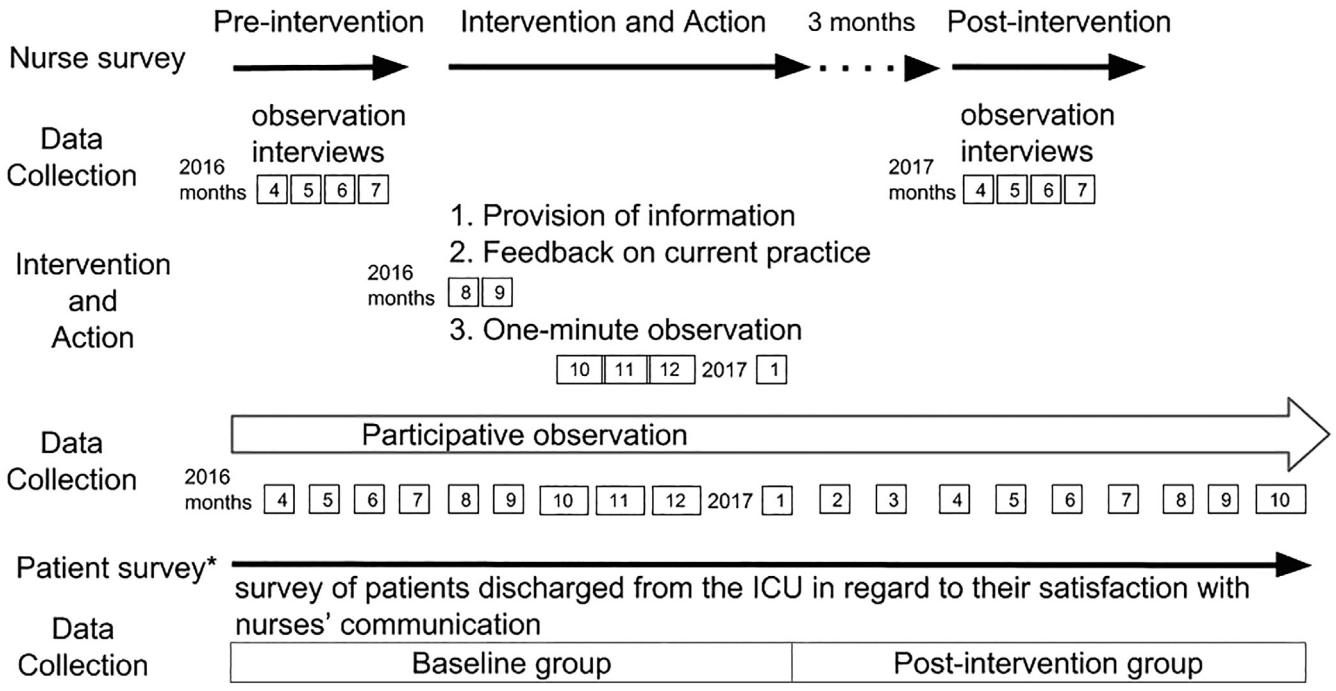

Fig. 1. Overview of the study. This figure illustrates the procedures conducted in each phase of the study. For the patient survey, the baseline group and the post-intervention group consisted of different patients. *All mechanically ventilated patients in the ICU during the research period.

duties. All 18 nurses were willing to participate, but one transferred to another ward after the pre-intervention interview, so the final sample comprised 17 nurses (see Table 1). Observations of patient-nurse interactions were conducted during the four months preceding and the four months following the intervention. An overview of the participants in the nurses' survey is shown in Table 2; Table 3 shows IRRs and 95% CIs for the patient-nurse interactions.

Nurses' trajectory of change

The participation observation was conducted for a total of 303 days, comprising at most 24 days and at least eight days a month, not including the days on which patient-nurse interaction and the practical epochés were conducted. The practical epochés took four months to administer to all participants. The total interview length was 1342.7 minutes. Content analysis produced 99 codes and generated 17 categories and three themes: 1) 'developing awareness of personal nursing practice, sharing deficiencies in competence, and increasing interest in others' nursing practices'; 2) 'recognising ethical questions concerning restraint, sedation, and the patient-nurse relationship' and 3) 'considering nursing actions from patients' perspectives while experiencing feelings of imperfection and addressing the identified ethical questions'. Additionally, two stages relating to the change among the nurses were extracted from the field notes: 1) 'reflecting, based on knowledge of patients' experiences, on nursing practices previously considered to be beneficial for patients' and 2) 'beginning to change nursing practice'.

The three themes of internal change and the two stages of change were integrated. The following section describes the nurses' trajectory of change, with each participant being assigned a unique, non-identifying number (i.e. 1–17) to ensure anonymity.

Phase 1. Developing awareness of personal nursing practice, sharing deficiencies in competence, and increasing interest in others' nursing practices.

During the observations and interviews before the intervention, nurses gradually became more aware of their own practice as they reflected on aspects of their work that they usually unconsciously performed. They reported feeling limited regarding their understanding of patients, '*it is difficult to keep believing in one's own ability*' [1] and heartrending feelings that LSMV patients 'may forget all of this' [16]. Moreover, they stated feeling a sense of insufficiency regarding their ability to entirely meet patients' needs because '*communication takes time*' [8] and '*I cannot stick around the bedside all of the time*' [10]. In the feedback session, nurses again reported a shared feeling of insufficiency, but also noted that there were '*some nurses who acted differently*' [14], meaning that not all nurses shared a common practice. Further, the nurses became interested in each other's practice, reporting that they '*tried to observe others* (as the researchers did)' [7], and thought: '*I did this, but why? What was I thinking about?*' [13].

Phase 2. Reflecting, based on knowledge of patients' experiences, on nursing practices previously considered to be beneficial for patients.

Nurses made relatively few responses during the educational session concerning skills for communicating with intubated patients. They believed that they already knew and practiced most of the communication skills, except those concerning the use of high-tech tools: '*there is no perfect skill to perfect communication*' [17]. On the other hand, all participants had strong reactions to the information concerning patients' experience. Many treatments can be painful but beneficial for the patient; the nurses managed feelings of doubt or resistance by believing that such treatment

Table 1
Nurses' characteristics (n = 17).

Items	Number of people	%
Years of nursing experience Median (Interquartile range) = 8 (3.5–20) years		
Less than five years	7	41.2
Five years or more	10	58.8
Years of experience in current ICU Median (Interquartile range) = 6 (3–7) years		
Less than five years	5	29.4
Five years or more	12	70.6

Table 2
Overview of the participants in the nurses' survey (n = 17).

	pre-intervention (n = 17)	post-intervention (n = 17)
Observation hours		
Total	86.0	82.3
Median (Interquartile range)	5.6 (3.4–6.5)	6.4 (2.0–6.6)
Number of people		
handed nurse-call button to patient	7	8
handed writing instrument to patient	11	12
Length of the interview (min)		
Total	679.7	663.0
Median (Interquartile range)	36.7 (25.6–47.8)	39.0 (32.4–46.6)

Table 3
The frequency and incident-rate ratios of several aspects of patient-nurse interactions before and after the intervention (n = 17).

Observation items	Median frequency per hour		IRR (95% CI)
	Pre-intervention Median (IQR)	Post-intervention Median (IQR)	p-value
Nurse noticing a patient's intent to communicate	3.8 (1.6–5.7)	4.6 (2.6–10.3)	1.53 (1.31–1.79) $p < .001$*
Nurse noticing a patient's intent to communicate and also understanding the patient	3.3 (1.1–5.1)	3.4 (2.1–7.3)	1.37 (1.15–1.63) $p = .004$*
Total number of interactions	29.6 (19.4–29.2)	41.7 (29.0–48.3)	1.31 (1.23–1.39) $p < .001$*
Interactions reaching an understanding	16.9 (7.8–25.6)	25.6 (18.2–37.5)	1.43 (1.33–1.54) $p < .001$*
Nurse-initiated conversations	22.5 (14.1–32.6)	35.2 (23.4–42.2)	1.38 (1.29–1.47) $p < .001$*
Patient displaying intent to communicate	5.9 (2.6–8.8)	5.2 (3.1–10.8)	1.05 (0.92–1.20) $p = 0.48$

IRR = incidence rate ratio; CI = confidence interval; IQR = interquartile range.
* $p < .05$.

helped patients. Therefore, the nurses were surprised, commenting: '*how surprising, patients want to be awake… we thought that being awake would be more stressful*' [2]. Some nurses, upon hearing their practices described from the patients' points of view, rebelled, stating: '*we try hard to help patients; I'm shocked!*' [3]; '*I am not a servant!*' [5]; and '*even if more is requested, I cannot do any more…*' [1]. Additionally, they looked at photographs of past LSMV patients, and reflected on their current practice of using deeper sedation: '*We have not seen any MV patients awake* (lightly sedated) *like this recently*' [6].

Phase 3. Recognising ethical questions concerning restraint, sedation, and the patient-nurse relationship.

Nurses were shocked to realise that restraining patients was now their habitual practice. The nurses realised that they were depriving the patients of their freedom by using restraints and increasing the sedation of difficult patients. They also found it challenging to identify what patients were seeking before deciding to use restraints. Moreover, they realised that, in regard to sedated patients who cannot speak: '*nurses have more initiative than them*' [12]; '*our position is more advantageous than that of the patient*' [5]; and '*we tend to treat these patients as people with low cognitive functions*' [11]. The nurses began to experience self-conflict once they noticed these ethical questions regarding their daily practice.

Phase 4. Considering nursing actions from patients' perspectives while experiencing feelings of imperfection and addressing the identified ethical questions.

Practical epoché were conducted one to three times (twice on average) with each nurse. The nurses then reported to the researcher their reflections on what they saw or thought during practice. Afterwards, during their day-to-day practice, nurses reported that '*quite frequently, I had a sense of being aware of what I was doing*' [13]. Their awareness that they were considering their actions during practice produced a renewed interest in what other nurses were thinking.

After the practical epoché, patients' perspectives began to enter into the nurses' reflections on their nursing practice. With this change, they began to think: '*I use a nurse's perspective, but have not usually considered the patients' points of view*' [15]; consequently, they began to question their practices, which led to feelings of doubt and questioning of the day-to-day practices they had believed to be best. Until this point, their care for patients had been decided by considering what they would prefer if they were a patient, but these decisions were still made from the perspective of a nurse. Once they had been exposed to the patient's viewpoint, they could no longer answer this question easily; '*It is difficult to identify the correct approach, and I am constantly uncertain. I can't do anything…*' [4]; and '*am I forcing my form of treatment on the patient?… I have recently begun to consider the ethical issues*' [16]; consequently, their feelings of insufficiency increased, and they began to feel distressed.

At this stage, the nurses also came to recognise that '*I cannot understand patients without direct input from them, as they are different to myself*' [14]. With this new awareness of their limits understanding others, they attempted to understand their patients and to contemplate their actions as nurses.

Phase 5. Beginning to change nursing practice.

Opinions on whether the use of restraint was problematic differed between nurses. For example, '*to fulfil our responsibility to*

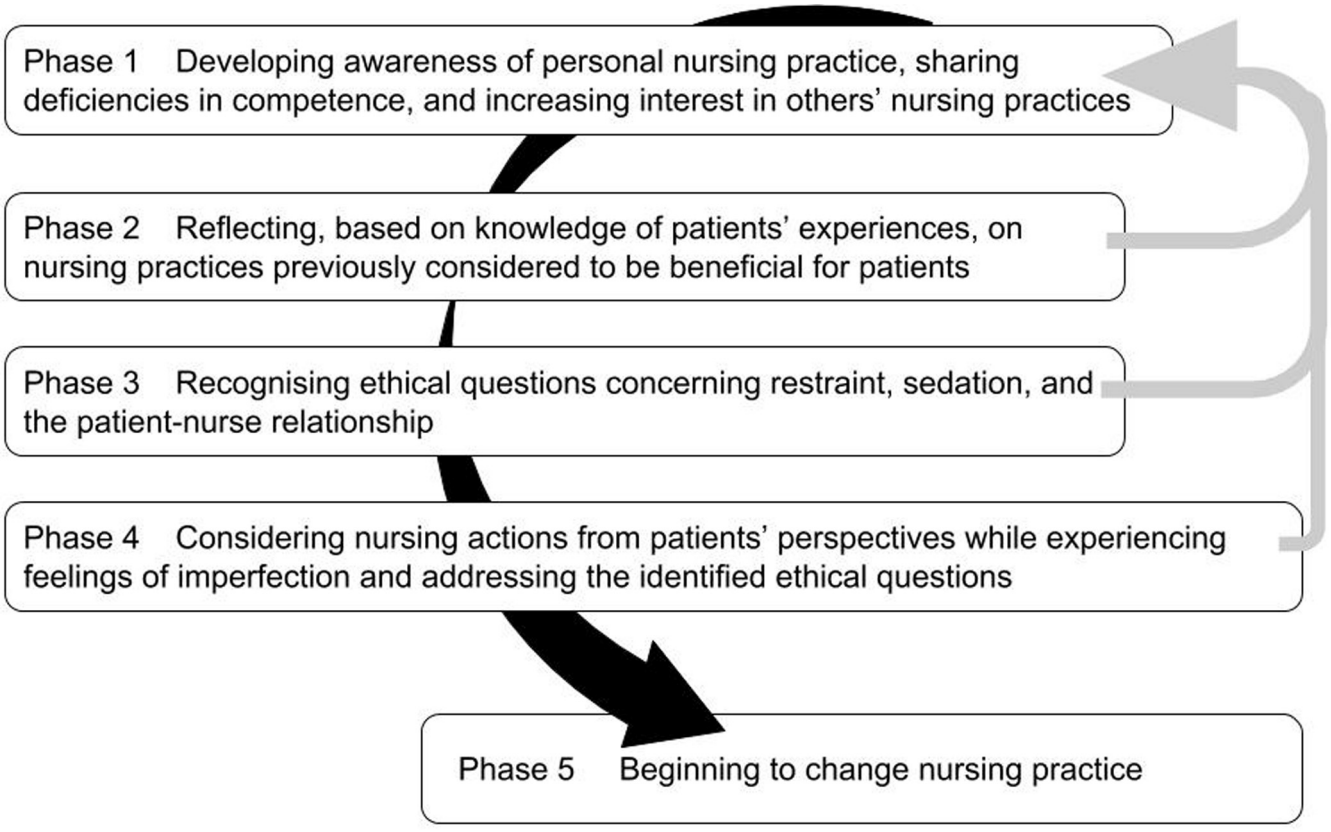

Fig. 2. The trajectory of change among nurses during and following the AR intervention. The five phases were integrated from three themes of nurse internal change extracted from content analysis of interview and two stages based on description of field notes.

protect the patient from accidents' [9], a lack of restraint would cause issues. Nurses who recognised that patient restraint was now 'habitual' reported plans to promote care that avoided using restraints, hoping that '*if one person begins it, the practice will spread*' [3].

At the commencement of the study, confrontations between intensive care doctors and nurses who wished to sedate patients more deeply were observed. After the intervention, the doctors reported that such confrontations had become much rarer. When the doctors learned that the ICU nurses were participating in this research, they encouraged the nurses to practice early mobilisation of LSMV patients. Furthermore, the doctors, clinical engineering technicians, and physical therapists reported daily examples of LSMV patients sitting on the edge of their beds, standing and walking by their wheelchairs.

Fig. 2 shows a conceptual diagram of the trajectory of the change in the nurses' practices, with each phase returning to the nurses' improving their awareness of their practice and developing an interest in others' practices. They considered other nurses' practices, examined their own practice, repeated this process and eventually, approached the phase in which they began to change their practice by contemplating their actions from patients' viewpoints.

Results of the patient survey

Fifty patients in the ICU met the inclusion criteria for the patient survey, and all consented to participate; 14 of these were allocated to the baseline group. The characteristics of these participants are shown in Table 4.

Table 5 displays a between-group comparison regarding patient satisfaction, and Fig. 3 illustrates the changes in patient satisfaction over time during the study period, using smoothed lines.

Table 4
Overview of the participants in the patient survey (n = 50).

Characteristic	Baseline group (n = 14)	Post-intervention group (n = 36)	
Sex	Number of people (%)		
Female	6 (43)	14 (57)	
Male	8 (39)	22 (61)	
	Median (Interquartile range)		
Age (year)	62 (54.0–65.3)	63 (49.5–69.8)	
Duration of intubation (hr)	17.5 (5.5–179.3)	22.5 (11–66.5)	$p = 0.91$
APACHEII, Median (IQR)	15 (12.8–19.3)	16.5 (14–20.8)	$p = 0.57$

Wilcoxon's rank sum test was used to determine p values.
APACHE II: Acute Physiology and Chronic Health Evaluation II.
$^{*}p < .05$; IQR = Interquartile Range.

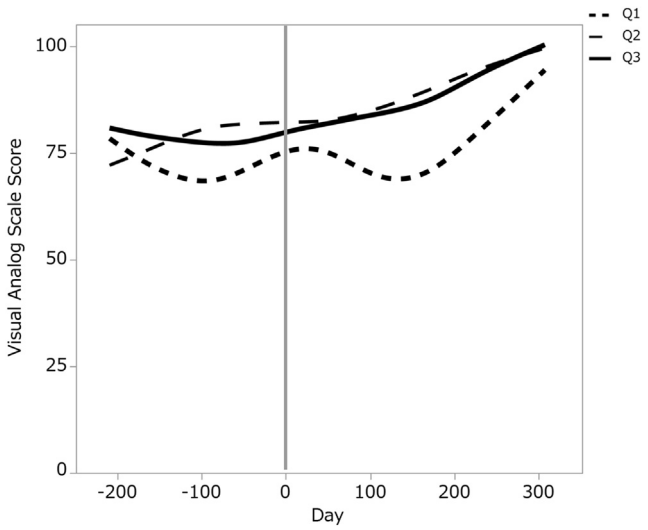

Fig. 3. Change in patient satisfaction over the study period. Each smoothed line represents patients' responses to one of the items, provided on VAS. Day 0 represents the day when all interventions with the nurses were complete. Significant change trajectories were observed for responses to item 3. Q1. '*When you wanted to communicate with an ICU nurse, the nurse noticed this and responded.*' Q2. '*Nurses in the ICU seemed to be consistently aware of your presence and consciousness.*' Q3. '*The nurses in the ICU respected your wishes and dignity when you tried to communicate with them.*'

Discussion

This intervention focused on increasing ICU nurses' awareness of LSMV patients' intent to communicate and to instigate changes in the nurses' practice.

During the intervention, the one-minute patient observation provided an opportunity for nurses to notice LSMV patients' intent to communicate. The practical epochés appeared to embody the nurses' explorations of their interest in LSMV patients. After the intervention, all of the nurses reported that they had begun to '*try to see through the patients' eyes*' (or words to a similar effect). The nurses began to realise their latent interest in the patients, increase their awareness of the patients, and consider the patients' perspectives. The nurses also began to notice when LSMV patients attempted to speak and improved their understanding of the patients.

The LSMV patients found the nurses' caring attitude meaningful, considering it to indicate that their nurses were interested in them (Laerkner et al., 2017); the nurses' increased interest and adoption of patients' viewpoints may have contributed to patients' feeling respected. However, the increase in patient satisfaction was negligible, despite an increase in the number of observed

Table 5
Comparison of patient satisfaction before and after the intervention with nurses ($n = 50$).

		Median (IQR)		
		Pre-intervention ($n = 14$)	Post-intervention ($n = 36$)	p
Q1	When you wanted to communicate with an ICU nurse, the nurse noticed this and responded.	85 (35.0–100) ($n = 13$)	90 (61.3–100) ($n = 36$)	0.288
Q2	Nurses in the ICU seemed to be consistently aware of your presence and consciousness.	90 (55.0–100) ($n = 13$)	100 (88.8–100) ($n = 34$)	0.129
Q3	The nurses in the ICU respected your wishes and dignity when you tried to communicate with them.	80 (68.5–93.5) ($n = 14$)	100 (90.0–100) ($n = 36$)	0.007*

We measured these items using a VAS (featuring 100 mm blank lines, for which the ends were labelled 'strongly disagree' and 'strongly agree', respectively).
IQR = interquartile range; $^{*}p < .05$.
Wilcoxon's rank sum test was used to determine p values.

interactions. For LSMV patients, being ignored by their nurses may be more significant than being understood; nurses' improved awareness of patients' intent to communicate may have merely reduced the frequency by which patients felt they were ignored.

Considering their practice from patients' viewpoints has been found to increase 'the dissatisfaction, incompetence, and guilt experienced by nurses who could not respond to communication by LSMV patients' (Everingham et al., 2014). Additionally, the nurses in this study experienced moral distress through realising that they preferred LSMV patients to remain silent (Radtke et al., 2012). Such surprise, frustration and disappointment due to feeling helpless have been reported in nurses when they are unable to practice in accordance with their ethical standards, which in turn lowers the quality of care they provide and has caused ICU nurses to consider quitting their jobs (Henrich et al., 2017). In this study, almost all of the nurses showed that they desired to improve patient care; further, by sharing their wishes with their team members, the moral distress was also shared. Consequently, the nurses did not quit their jobs or cease communicating with patients. Instead, both the number of interactions and interactions that reached an understanding increased, and nurses became more aware of patients' intent to communicate. Thus, this sharing of desires and distress may have encouraged nurses to acknowledge their team's problems and to collectively change their practice.

To improve ICU patient care, changing the care process and culture is necessary (Vincent et al., 2016). The existence of a culture that supports improvement in organisational quality and willingness to change can indirectly shape the success of quality improvement in healthcare (Kaplan et al., 2012). As all nurses in the ICU participated in the AR, other staff members in the ICU noticed the nursing team's desires, which in turn created an environment supportive of changes in practice.

Further, the team's shared desire to improve patient care also contributed to forming the foundation for a change in practice. However, before the emergence of this shared desire nurses had been practising patient care that they believed was beneficial for patients. Therefore, the nurses were surprised to find that their previous practices had not been best for patients. This shock underlines the strength of this desire among the nurses.

In the present study, nurses thought that they were already using appropriate communication skills with intubated patients. Over half of the nurses provided writing instruments to their patients; however, over half of the nurses also failed to hand nurse-call buttons to their patients, which would have enabled them to begin a dialogue. Thus, some nurses did not provide their patients with a means to take the initiative in beginning communication, despite acknowledging the ability of LSMV patients to interact. Until now, in communication with MV patients, ICU nurses focused on decoding non-verbal messages in an attempt to minimise the suffering and fatigue of critically ill patients (Choi et al., 2017). In other words, underlying the paradigm of communication controlled by the nurse is a desire to do what is best for the patients. This desire to do the best for their patients may drive nurses to persist with a paradigm that does not match the patient's interests, unless the nurses reconsider whether their goals are patient-centred.

Finally, the number of attempts LSMV patients made to communicate did not increase, although patients' level of satisfaction did. This initially appears to suggest that, for both sides, increased communication initiation is not an indication of respect for LSMV patients' dignity. However, in this situation, the ability to initiate communication remains with the nurse. Thus, judgment on this should be postponed until the ability to initiate communication returns to the patient.

Limitations

Regarding observation of patient-nurse interactions, a potential limitation to this approach is that some activity could have been missed while notes were being written concerning directly observed activity. The questions in the patient survey were developed and tested for clarity and understanding. However, the wording of the questions could have been revised to further reduce any possible bias. A single researcher conducted all data collection; therefore, conducting a real-time patient survey in parallel with fieldwork was difficult. Quantitative measurements that assessed nurses' practical skills and workload, which may affect changes in nurse practice, were not examined in the present study. Additionally, changes in the nurses' practice may have had an effect on the patients' families. Further investigation is needed in these three areas; moreover, understanding the influence of this intervention on patient outcomes, such as restraint rate, incidence of delirium, time spent under mechanical ventilation, duration of ICU stay and hospital stay is necessary.

Conclusion

The use of AR revealed that individual nurses and teams wish to improve patient care. Taking the opportunity provided by practical epochés, nurses became better able to notice LSMV patients' intent to communicate, commenced contemplating their actions from patients' viewpoints, and began to change their practice. This change may have produced an increase in LSMV patients' levels of satisfaction. To improve their practice, ICU nurses should provide LSMV patients with a means of initiating communication, with the goal being to provide patient-centred care that accommodates interactive communication and respects patients' human dignity.

Ethical statement

On behalf of my co-authors, I am submitting the enclosed material (Promoting a nursing team's ability to notice intent to communicate in lightly sedated mechanically ventilated patients in an Intensive Care Unit: an action research study) for possible publication in your journal.

We certify that we have participated sufficiently in the work to take public responsibility for the appropriateness of the experimental design and method, and the collection, analysis, and interpretation of the data.

We have reviewed the final version of the manuscript and approve it for publication. To the best of our knowledge and belief, this manuscript has not been published in whole or in part nor is it being considered for publication elsewhere.

Acknowledgements

We would like to express our heartfelt gratitude to the patients and the ICU nurses who participated in this research. We would also like to thank all of the critical care nursing specialists for their useful contributions to the qualitative content analysis conducted in the study, as well as their critiquing of the overall research.

We would like to thank Professor Makoto Tanaka for her guidance and encouragement.

We also would like to thank Professor Tetsuya Sakakibara and Professor Yasuhiko Murakami for their advice concerning phenomenology.

Conflict of interest

None. The authors declare that they have no competing interests.

Funding

None. This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethical approval details

This study was approved by the Faculty of Medicine of Tokyo Medical and Dental University Ethics Committee (approval number: 2327) and the institutional review boards of Kyoto Prefectural University of Medicine (approval number: ERB-E-318).

Author contributions

All authors contributed to the study conception and design. AN was responsible for data collection, and AN, TI, and IY analysed the data. AN drafted the manuscript, and all authors conducted critical revisions of the paper.

References

Ashworth, P., 1980. Care to Communicate: An Investigation into Problems of Communication between Patients and Nurses in Intensive Therapy Units. RCN Research Series. Whitefriars Press, London.

Balas, M.C., Vasilevskis, E.E., Burke, W.J., Boehm, L., Pun, B.T., Olsen, K.M., Gregory, J. P., Ely, E.W., 2012. Critical care nurses' role in implementing the "ABCDE bundle" into practice. Crit. Care Nurse 32 (2), 35–47. https://doi.org/10.4037/ccn2012229.

Balas, M.C., Weinhouse, G.L., Denehy, L., Chanques, G., Rochwerg, B., Misak, C.J., Skrobik, Y., Devlin, J.W., Fraser, G.L., 2018. Interpreting and Implementing the pain, agitation/sedation, delirium, immobility, and sleep disruption clinical practice guideline. Crit. Care Med. 46 (9), 1464–1470. https://doi.org/10.1097/CCM.0000000000003307.

Barr, J., Fraser, G.L., Puntillo, K., Ely, E.W., Gélinas, C., Dasta, J.F., Davidson, J.E., Devlin, J.W., Kress, J.P., Joffe, A.M., Coursin, D.B., Herr, D.L., Tung, A., Robinson, B. R., Fontaine, D.K., Ramsay, M.A., Riker, R.R., Sessler, C.N., Pun, B., Skrobik, Y., Jaeschke, R., American College of Critical Care Medicine, 2013. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Crit. Care Med. 41 (1), 263–306. https://doi.org/10.1097/CCM.0b013e3182783b72.

Baumgarten, M., Poulsen, I., 2015. Patients' experiences of being mechanically ventilated in an ICU: a qualitative metasynthesis. Scand. J. Caring. Sci. 29 (2), 205–214. https://doi.org/10.1111/scs.12177.

Bergbom-Engberg, I., Haljamäe, H., 1993. The communication process with ventilator patients in the ICU as perceived by the nursing staff. Intensive Crit. Care Nurs. 9 (1), 40–47.

Chenail, R.J., St. George, S., Wulff, D., Cooper, R., 2010. Action research: methodologies. In: Munhall, P.L. (Ed.), Nursing Research: A Qualitative Perspective. fifth ed. Jones & Bartlett Learning, Miami, Florida, pp. 455–462.

Choi, J., Campbell, M.L., Gélinas, C., Happ, M.B., Tate, J., Chlan, L., 2017. Symptom assessment in non-vocal or cognitively impaired ICU patients: Implications for practice and future research. Heart Lung 46 (4), 239–245. https://doi.org/10.1016/j.hrtlng.2017.04.002.

Cooper, A., 2000. Action Research in Health Care. Blackwell Science, Oxford.

Cutler, L.R., Hayter, M., Ryan, T., 2013. A critical review and synthesis of qualitative research on patient experiences of critical illness. Intensive Crit. Care Nurs. 29 (3), 147–157. https://doi.org/10.1016/j.iccn.2012.12.001.

Elo, S., Kyngäs, H., 2008. The qualitative content analysis process. J. Adv. Nurs. 62 (1), 107–115. https://doi.org/10.1111/j.1365-2648.2007.04569.x.

Engström, Å., Nyström, N., Sundelin, G., et al., 2013. People's experiences of being mechanically ventilated in an ICU: a qualitative study. Intensive Crit. Care Nurs. 29 (2), 88–95.

Everingham, K., Fawcett, T., Walsh, T., 2014. 'Targeting' sedation: the lived experience of the intensive care nurse. J. Clin. Nurs. 23 (5–6), 694–703. https://doi.org/10.1111/jocn.12058.

Fink, R.M., Makic, M.B., Poteet, A.W., Oman, K.S., 2015. The ventilated patient's experience. Dimens. Crit. Care Nurs. 34 (5), 301–308. https://doi.org/10.1097/DCC.0000000000000128.

Finke, E.H., Light, J., Kitko, L., 2008. A systematic review of the effectiveness of nurse communication with patients with complex communication needs with a focus on the use of augmentative and alternative communication. J. Clin. Nurs. 17 (16), 2102–2115. https://doi.org/10.1111/j.1365-2702.2008.02373.x.

Greenwood, D.J., 1999. Action Research: From Practice to Writing in an International Action Research Development Program. John Benjamins Publishing Company, Amsterdam.

Guttormson, J.L., Bremer, K.L., Jones, R.M., 2015. Not being able to talk was horrid: A descriptive, correlational study of communication during mechanical ventilation. Intensive Crit. Care Nurs. 31 (3), 179–186. https://doi.org/10.1016/j.iccn.2014.10.007.

Hall, D.S., 1996. Interactions between nurses and patients on ventilators. Am. J. Crit. Care 5 (4), 293–297.

Happ, M.B., Garrett, K., Thomas, D.D., Tate, J., George, E., Houze, M., Radtke, J., Sereika, S., 2011. Nurse-patient communication interactions in the intensive care unit. Am. J. Crit. Care 20 (2), e28–40. https://doi.org/10.4037/ajcc2011433.

Happ, M.B., 2013. SPEACS-2 communication training program. http://nucleus.con.ohio-state.edu/media/speacs2/speacs.htm (accessed 18.07.03).

Henrich, N.J., Dodek, P.M., Gladstone, E., Alden, L., Keenan, S.P., Reynolds, S., Rodney, P., 2017. Consequences of moral distress in the intensive care unit: a qualitative study. Am. J. Crit. Care 26 (4), e48–e57. https://doi.org/10.4037/ajcc2017786.

Holm, A., Dreyer, P., 2017. Nurse-patient communication within the context of non-sedated mechanical ventilation: a hermeneutic-phenomenological study. Nurs. Crit. Care 23 (2), 88–94. https://doi.org/10.1111/nicc.12297.

Husserl, E., 1929. Cartesian Meditations: An Introduction to Phenomenology [translated by Cairns. D., 1977]. Nijhoff M, The Hague.

Lave, J., Wenger, E., 1991. Situated Learning: Legitimate Peripheral Participation. Cambridge University Press, Cambridge.

Kaplan, H.C., Provost, L.P., Froehle, C.M., Margolis, P.A., 2012. The model for understanding success in quality (MUSIQ): building a theory of context in healthcare quality improvement. BMJ. Qual. Saf. 21 (1), 13–20. https://doi.org/10.1136/bmjqs-2011-000010.

Karlsson, V., Bergbom, I., Forsberg, A., 2012a. The lived experiences of adult intensive care patients who were conscious during mechanical ventilation: a phenomenological-hermeneutic study. Intensive Crit. Care Nurs. 28 (1), 6–15. https://doi.org/10.1016/j.iccn.2011.11.002.

Karlsson, V., Forsberg, A., Bergbom, I., 2012b. Communication when patients are conscious during respirator treatment–a hermeneutic observation study. Intensive Crit. Care Nurs. 28 (4), 197–207. https://doi.org/10.1016/j.iccn.2011.12.007.

Karlsson, V., Lindahl, B., Bergbom, I., 2012c. Patients' statements and experiences concerning receiving mechanical ventilation: a prospective video-recorded study. Nurs. Inq. 19 (3), 247–258. https://doi.org/10.1111/j.1440-1800.2011.00576.x.

Kemmis, S., 2007. Action Research as a Practice-changing Practice. https://www.infor.uva.es/≃amartine/MASUP/Kemmis_2007.pdf (accessed 18.08.17).

Kemmis, S., McTaggart, R., 2005. Participatory action research: communicative action and the public sphere. In: Denzin, N.K., Lincoln, Y.S. (Eds.), The Sage Handbook of Qualitative Research. Sage Publications, Thousand Oaks, CA, pp. 559–603.

Laerkner, E., Egerod, I., Olesen, F., Hansen, H.P., 2017. A sense of agency: an ethnographic exploration of being awake during mechanical ventilation in the intensive care unit. Int. J. Nurs. Stud. 75, 1–9. https://doi.org/10.1016/j.ijnurstu.2017.06.016.

Myhren, H., Tøien, K., Ekeberg, O., Karlsson, S., Sandvik, L., Stokland, O., 2009. Patients' memory and psychological distress after ICU stay compared with expectations of the relatives. Intensive Care Med. 35 (12), 2078–2086. https://doi.org/10.1007/s00134-009-1614-1.

Nilsen, M.L., Sereika, S., Happ, M.B., 2013. Nurse and patient characteristics associated with duration of nurse talk during patient encounters in ICU. Heart Lung 42 (1), 5–12. https://doi.org/10.1016/j.hrtlng.2012.10.003.

Noguchi, A., Inoue, T., 2016. The life experience of patients conscious on light sedated being mechanically ventilated in an ICU. J. Jpn. Acad. Crit. Care Nurs. 12 (1), 39–48.

Prime, D., Arkless, P., Fine, J., Winter, S., Wakefield, D.B., Scatena, R., 2016. Patient experiences during awake mechanical ventilation. J. Community Hosp. Intern. Med. Perspect. 6 (1), 30426.

Radtke, J.V., Tate, J.A., Happ, M.B., 2012. Nurses' perceptions of communication training in the ICU. Intensive Crit. Care Nurs. 28 (1), 16–25. https://doi.org/10.1016/j.iccn.2011.11.005.

Rotondi, A.J., Chelluri, L., Sirio, C., Mendelsohn, A., Schulz, R., Belle, S., Im, K., Donahoe, M., Pinsky, M.R., 2002. Patients' recollections of stressful experiences while receiving prolonged mechanical ventilation in an intensive care unit. Crit. Care Med. 30 (4), 746–752.

Samuelson, K.A., 2011. Unpleasant and pleasant memories of intensive care in adult mechanically ventilated patients–findings from 250 interviews. Intensive Crit. Care Nurs. 27 (2), 76–84. https://doi.org/10.1016/j.iccn.2011.01.003.

Sessler, C.N., Gosnell, M.S., Grap, M.J., Brophy, G.M., O'Neal, P.V., Keane, K.A., Tesoro, E.P., Elswick, R.K., 2002. The Richmond Agitation-Sedation scale: validity and reliability in adult intensive care unit patients. Am. J. Respir. Crit. Care Med. 166 (10), 1338–1344. https://doi.org/10.1164/rccm.2107138.

Tembo, A.C., Higgins, I., Parker, V., 2015. The experience of communication difficulties in critically ill patients in and beyond intensive care: Findings from a larger phenomenological study. Intensive Crit. Care Nurs. 31 (3), 171–178. https://doi.org/10.1016/j.iccn.2014.10.004.

Vincent, J.L., Shehabi, Y., Walsh, T.S., Pandharipande, P.P., Ball, J.A., Spronk, P., Longrois, D., Strøm, T., Conti, G., Funk, G.C., Badenes, R., Mantz, J., Spies, C., Takala, J., 2016. Comfort and patient-centred care without excessive sedation: the eCASH concept. Intensive Care Med. 42 (6), 962–971. https://doi.org/10.1007/s00134-016-4297-4.

Voutilainen, A., Pitkäaho, T., Kvist, T., Vehviläinen-Julkunen, K., 2016. How to ask about patient satisfaction? the visual analogue scale is less vulnerable to confounding factors and ceiling effect than a symmetric Likert scale. J. Adv. Nurs. 72 (4), 946–957. https://doi.org/10.1111/jan.12875.