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Bjorn, Annika

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Original article

Video education for critical care nurses to assess pain with a behavioural pain assessment tool: A descriptive comparative study

Annika Björn[a,b,*,1], Sanna-Mari Pudas-Tähkä[a], Sanna Salanterä[a,c], Anna Axelin[a]

[a] University of Turku, Department of Nursing Science, Turku FIN-20014, Finland
[b] Helsinki University Hospital, HUCH Perioperative, Intensive Care and Pain Medicine, Helsinki, Finland
[c] Turku University Hospital, Hospital District of South-West Finland, Finland

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ABSTRACT

Aim: To evaluate the impact of video education on critical care nurses' knowledge and skills in using a behavioural pain assessment tool for intensive care patients and to explore the nurses' experiences with video education.
Methods: Forty-eight nurses in one intensive care unit watched an educational video on the use of the Critical-Care Pain Observation Tool, then assessed pain in two patients with the tool and took a knowledge test. The researcher made parallel pain assessments. Interrater reliability of patients' pain assessment between nurses and the researcher was determined to examine nurses' skills in using the tool after education. Twenty nurses were interviewed about their experiences with the video education. Interviews were analysed with deductive thematic analysis.
Results: The knowledge test scores indicated that the nurses learned the principles of how to use the tool. The interrater reliability of pain assessments reached a moderate level of agreement during the painful procedure, with a weighted kappa coefficient value of 0.48, CL [0.37, 0.58]. The nurses perceived video education positively, but requested additional interaction.
Conclusions: Video education is useful in teaching the principles of using a pain assessment tool. Additional clinical training is required for nurses to reach adequate skills in using the tool.

Implications for clinical practice

- Adequate, standardised education is required for accurate pain assessment using the CPOT.
- Video education is a useful method to teach critical care nurses the principles of using a behavioural pain assessment tool, but further training including interaction and feedback is required for these nurses to develop adequate skills in using the tool.
- After video education on the use of a behavioural pain assessment tool, the assessment of skills in using the tool is important to ensure the tool is appropriately used.

Introduction

Pain is a common problem among patients in intensive care units (ICUs) (Barr et al., 2013; Puntillo et al., 2014). The incidence of moderate to severe pain at rest is over 50% among these patients (Chanques et al., 2007), and patients are recurrently exposed to procedures known to be painful (Puntillo et al., 2014). Recognition and assessment are the first steps in the appropriate treatment of pain (Abu-Saad Huijer et al., 2012). Therefore all patients should be systematically assessed for pain (Barr et al., 2013; Herr et al., 2011).

Patient's self-report of pain is considered the "gold standard" of pain assessment. Intensive care patients' ability to communicate is often compromised and a self-report difficult to obtain. Health care professionals are recommended to use a valid behavioural pain scale (Barr et al., 2013). Several behavioural pain scales for ICU patients have been developed (Pudas-Tähkä et al., 2009), but

* Corresponding author at: University of Turku, Department of Nursing Science, Turku, Finland.
E-mail address: annika.bjorn@hus.fi (A. Björn).
[1] Present address: HUCH Perioperative, Intensive Care and Pain Medicine, Critical Care Clinic, Helsinki University Hospital, P.O. Box 340, 00029 HUS, Finland.

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of these, the Behavioural Pain Scale (BPS) (Payen et al., 2001) and the Critical-Care Pain Observation Tool (CPOT) (Gélinas et al., 2006) are considered the most valid and reliable (Barr et al., 2013). These tools support decision-making in pain management (Gélinas, 2016; Wøien and Bjørk, 2013), and by implementing such tools, pain recognition and assessment can be improved (Arbour et al., 2011).

Critical care nurses (CCNs) play an important role in pain assessment, especially when patients are unable to communicate (Herr et al., 2011). Every CCN should be able to assess and manage pain based on evidence and existing guidelines (Abu-Saad Huijer et al., 2012). CCNs not only need knowledge of pain physiology and effective pain management but also require knowledge of reliable pain assessment tools (Abu-Saad Huijer et al., 2012) and of how to use them (Gélinas, 2011; Gélinas, 2016). Studies show deficiencies in CCNs' current knowledge, skills (Schreiber et al., 2014; Wang and Tsai, 2010) and attitudes (Lewis et al., 2015) regarding pain assessment. CCNs find pain assessment to be especially challenging when patients are sedated and are unable to self-report pain (Rose et al., 2011; Wøien and Bjørk, 2013). Even though behavioural pain scales exist, CCNs rarely use them (Payen et al., 2007; Rose et al., 2012).

To improve the systematic assessment of the pain of ICU patients, guidelines and education on pain assessment and the use of pain assessment tools are needed (Payen et al., 2007). Education increases CCNs' knowledge of pain care (Erkes et al., 2001; Lewis et al., 2015; McNamara et al., 2012), decreases their negative biases related to pain management (Lewis et al., 2015) and motivates CCNs to improve pain management (Brockopp et al., 2004). Importantly, education should motivate CCNs to understand and use pain assessment tools (Payen et al., 2007; Rose et al., 2012). Effective education is also the prerequisite for the reliable use of pain assessment tools. Albeit, quality control regarding users' skills, such as using interrater reliability calculations, is also needed. (Gélinas, 2011).

The challenge concerning education is to find effective methods of increasing CCNs' knowledge and decreasing their biases (Schreiber et al., 2014). Furthermore, even though nurses perceive education to be important, barriers to its realisation, such as time constraints, obligations of patient care (Govranos and Newton, 2014), financial constraints and a lack of leadership support (Santos, 2012), have to be acknowledged. Education must be easily available, accessible (Govranos and Newton, 2014) and suitable for the clinical context (Horbury et al., 2005). From a nurses' perspective, video education is considered a flexible (Kelly et al., 2009; O'Dowd Bell, 2012) and self-directed (Klingbeil et al., 2009) education method. Educational videos have been used to demonstrate patient behaviour in teaching nurses to use assessment tools (Lucas and Knobel, 2012; Riekerk et al., 2009). Education on CPOT use has also previously included video education (Gélinas et al., 2011). However, whether nurses are able to implement knowledge gained through video education into their assessment skills is not well known. This study aimed to evaluate the impact of video education on CCNs' knowledge and skills in using the CPOT and to explore CCNs' experiences with video education.

Methods

Aims and objectives

The aim of this study was to evaluate the impact of a video education method on CCNs' knowledge and skills in using a pain assessment tool for non-communicative ICU patients and to explore their experiences with this method.

The objectives were:

- to evaluate CCNs' knowledge of CPOT after video education.
- to examine CCNs' skills in using CPOT after video education by measuring agreement (interrater reliability) of pain assessment between the video-educated CCNs and an expert.
- to explore CCNs' experiences of video education as a learning method.

Design

A descriptive comparative study design using quantitative and qualitative research methods was used to measure the impact of video education on CCNs' knowledge and skills in assessing the pain of non-communicative ICU patients and to explore CCNs' experiences with video education. Deductive thematic analysis of the qualitative data enabled the context of the quantitative measurements to be understood (Schumacher et al., 2005).

Study setting and sample

The study was conducted in an ICU providing the highest level of care (III) (Valentin and Ferdinande, 2011). The patient population in the 16-bed ICU consisted of acute non-surgical as well as acute and elective surgical patients. Behavioural pain assessment tools were not used in the unit.

The total population of 122 CCNs working in the ICU were all invited to participate in the study and eventually 48 CCNs (39%) were recruited and agreed to participate. The CCNs were recruited by the researcher and the ward contact person through information sessions. Forty-two of the 48 who agreed to participate volunteered to be interviewed. In the end 20 CCNs were interviewed during 13 interview sessions, either individually (n = 6) or in pairs (n = 14), since interviews were conducted until saturation of the qualitative data was reached, i.e., when no new information emerged.

The CPOT and video education method

The CPOT was chosen for this study as it is a valid, reliable and clinically feasible tool (Barr et al., 2013). The CPOT was developed for assessing pain in critically ill adult patients unable to self-report pain. The CPOT includes four behavioural pain indicators: facial expression, body movements, compliance with ventilator (vocalisation for extubated patients) and muscle tension. Each indicator is scored on a scale from 0 to 2, with the total score varying from 0 to 8 (Gélinas et al., 2006). The CPOT is to be used when a patient is at rest to obtain a baseline value, during painful procedures, and before and after administering analgesics to assess the effectiveness of treatment (Gélinas, 2010). The CPOT has demonstrated moderate to high interrater reliability (Gélinas et al., 2006; Gélinas and Johnston, 2007; Marmo and Fowler, 2010), satisfactory sensitivity and specificity (Gélinas et al., 2009) and ability to discriminate between non-painful and painful procedures (Rijkenberg et al., 2015). Permission to use the CPOT was obtained from its developer, Dr Gélinas, and the Finnish translation of the tool was used (Pudas-Tähkä et al., 2013).

A 15-minute educational video on CPOT use was developed for the study. The researcher (AB) studied the use of the CPOT carefully with another researcher (SMPT) and watched the original CPOT education video to gain expertise in its use. A Finnish version of the video was important to ensure the best quality educational video suitable for the Finnish context. The script and structure of the video was based on the original education video made by the developers of the CPOT, who permitted translation and use of the video as an educational material. The video included an introduction explaining why pain assessment is important (2 minutes), a section introducing the CPOT (2.5 minutes), demonstration of its use with actors (4 minutes) and real patient examples (4 minutes) and a summary of the key principles of CPOT use (2.5 minutes).

Data collection methods and instruments

The data were collected between September 2013 and September 2014 in three consecutive phases. The CCNs had to complete the preceding phase before moving on to the next. First, the CCNs watched the CPOT education video online. The video was available for the whole study period and the CCNs could watch the video anytime, anywhere and as many times as needed. The CCNs were regularly reminded by the researcher (AB) to watch the video. The number of times each nurse watched the video was recorded.

In the second phase, the CCNs' skills in using the CPOT were measured by comparing the parallel pain assessment between the CCNs and the researcher. The CCNs used the CPOT to assess pain in two different ICU patients on two occasions. Each time a CCN made an assessment, the researcher made an independent, parallel assessment of the patient. A patient's pain was assessed before, during and after airway suctioning, a procedure known to be painful for patients (Puntillo et al., 2014). The assessments were made with adult, mechanically ventilated patients who needed suctioning for clinical care and had a sedation level from 0 to −3 on the Richmond Agitation Sedation Scale (RASS) (Sessler et al., 2002). Before each assessment, the researcher went briefly through the content, scale and assessment protocol of the CPOT together with the CCN. The scoring of the patient's pain was not discussed between the researcher and CCNs because the purpose was to examine interrater reliability. Interrater reliability refers to the strength of agreement on the patient's pain assessment between the video-educated CCNs and the researcher (AB), who had gained expertise on CPOT during the video development process. The range of values for interrater reliability is presented in Table 2.

Upon completion of each pain assessment the CCNs' knowledge of the principles of CPOT and the adequacy of the instructions were assessed. The knowledge test, based on the CPOT education video, was developed within the research group and included 12 true or false statements. To reduce guessing, the test also included the alternative “I don't know”. Every correct answer was scored with 1 point while incorrect or “I don't know” answers received 0 points, the maximum score being 12 points. The knowledge test was pilot tested before the data collection. Three volunteer CCNs from ICUs not participating in the study watched the video, took the test and gave comments by email. As a result of the pilot study, statement number 10 (Table 1) was determined to be confusing and was therefore revised to be more specific. The adequacy of the instructions on CPOT use was measured with the “Questionnaire about the Feasibility and Clinical Utility of the Critical-Care Pain Observation Tool (CPOT)” developed by Gélinas (2010). Permission to use this questionnaire was obtained from Dr Gélinas. Two out of the eight questions in the questionnaire were related to the CPOT learning process and are therefore reported in this article. The questions were: “*Was the length of time sufficient to train to use the CPOT accurately*?” and “*Were the directives about the use of the CPOT clear*?” The questions were answered on a Likert scale from 1 to 4 (1 = not at all, 2 = a little, 3 = sufficiently, 4 = very).

In the third phase, CCNs were interviewed about their experiences with the video education. These semi-structured individual or paired interviews were conducted by one researcher (AB) on the ICU in a room with minimal disturbance. The interviews were audio recorded. Combining individual and paired interviews was a flexible strategy for conducting interviews in the clinical setting. The interview topic was not considered intimate and therefore, paired interviews were considered as suitable as individual interviews. The interview guide was developed within the research group and comprised four themes:

1) Previous experiences in learning new practices and with video education.
2) The feasibility of video education in learning to use the CPOT.
3) Perceptions about the CPOT education video.
4) Suggestions for further development of the video education.

The interview guide was not revised based on the first interview, which served as a pilot. Background information—including age, gender, education, work experience in intensive care, previous education about pain assessment or management and familiarity with the CPOT before this study, was collected from the CCNs as part of the first knowledge test.

Data analysis

Quantitative data were analysed with IBM SPSS for Windows version 22.0 and SAS 9.3 (SAS Institute, Cary, NC). Descriptive statistics (frequencies, percentages, means and standard deviations) were calculated for the variables. A Wilcoxon signed rank test was used to examine the difference in the knowledge tests. Interrater reliability between CCNs and the expert was examined by calculating weighted kappa coefficients for the pain assessments.

The audiotaped interviews were transcribed and the data analysed with deductive thematic analysis, whereby the interview questions formed a loose framework (Braun and Clarke, 2006). In addition, the occurrence of sub-themes was quantified in order to explore the congruence of the CCNs' experiences (Waltz et al., 2010). No software was used in analysing the data. In the first phase of analysis, the researcher (SMPT) familiarised herself with the data and organised it under the four interview themes. In the second phase, the CCNs' quotations organised under each interview theme were inductively coded. In the third phase, the inductively formed codes were collated to more abstract-level sub-themes based on their shared meaning. In addition, the number of times the CCNs mentioned some of the major themes was calculated. In the fourth phase, the four interview themes were collated as two to avoid redundancy in presenting the findings. The analysis was closely supervised by the second researcher (AA). The third researcher (AB), who conducted the interviews, revised and confirmed that the final version of the findings reflected her understanding of the data.

Ethics

The study protocol and its ethics were approved by the hospital authorities (16.4.2013, § 80, Hospital District of Helsinki and Uusimaa). Written, informed consent was required in order to participate in the study. The CCNs were provided written and verbal information about the study, questions were answered and the voluntary nature of participation was explained. Confidentiality was assured, and to protect anonymity, participants were given an identification number that was used during the data collection and the transcription phase. The list of participants' names and identification numbers was kept secure and separate from the collected data. Only the research team had access to the data. According to Finnish legislation, research on nurses does not require separate ethical approval by medical ethics committee, which is aimed at patient research.

Table 1
Critical care nurses' answers in knowledge tests (n = 48).

Statement number	1. Knowledge-test (n = 48)				2. Knowledge-test (n = 46)[a]			
	Correct answers% (n)	Incorrect answers **%** (n)	"I don't know" answers **%** (n)	total%	Correct answers **%** (n)	Incorrect answers **%** (n)	"I don't know" answers **%** (n)	total%
1. CPOT can be used to measure the intensity of patients' pain (false)	**50** (24)	**50** (24)	**0**	100	**59** (27)	**41** (19)	**0**	100
2. CPOT can be used for pain assessment in patients with brain injury (false)	**77** (37)	**10** (5)	**13** (6)	100	**91** (42)	**7** (3)	**2** (1)	100
3. You should always try to obtain a self-report of pain from patient whenever possible (true)	**98** (47)	**2** (1)	**0**	100	**93** (43)	**7** (3)	**0**	100
4. Patient is attributed with the highest score of each behaviour observed during the pain assessment (true)	**100** (48)	**0**	**0**	100	**100** (46)	**0**	**0**	100
5. You should obtain a baseline pain assessment score with CPOT when the patient is at rest (true)	**98** (47)	**0**	**2** (1)	100	**100** (46)	**0**	**0**	100
6. A CPOT score of 1 or higher may indicate that the patient is suffering from pain (true)	**88** (42)	**8** (4)	**4** (2)	100	**89** (41)	**7** (3)	**4** (2)	100
7. Muscle tension is first evaluated when patient is at rest (false)	**96** (46)	**4** (2)	**0**	100	**78** (36)	**22** (10)	**0**	100
8. If patient lies still it means no pain (false)	**98** (47)	**2** (1)	**0**	100	**96** (44)	**4** (2)	**0**	100
9. A decrease in CPOT scores may indicate that the pain management interventions have been effective (true)	**94** (45)	**6** (3)	**0**	100	**98** (45)	**2** (1)	**0**	100
10. CPOT is based on the physiological and behavioural changes in the patient (false)	**29** (14)	**67** (32)	**4** (2)	100	**27** (12)	**60** (27)	**13** (6)	100
11. Intubated and extubated patients are assessed the same way with CPOT (false)	**67** (32)	**25** (12)	**8** (4)	100	**76** (35)	**22** (10)	**2** (1)	100
12. When observing facial expressions grimacing is attributed with the highest score (true)	**81** (39)	**19** (9)	**0**	100	**85** (39)	**15** (7)	**0**	100

CPOT = the Critical-Care Pain Observation Tool.
[a] one missing data in statement 10.

Table 2
Weighted kappa (κ) coefficient values before, during and after procedure (n = 94).

	Weighted κ[b] [95% CL]		
CPOT category	Before procedure	During procedure	After procedure
Facial expression	0.37 [0.14, 0.59]	0.51 [0.37, 0.66]	0.49 [0.30, 0.67]
Body movements	0.45 [0.00, 0.91]	0.50 [0.35, 0.64]	0.64 [0.40, 0.87]
Compliance with the ventilator	0.72 [0.53, 0.91]	0.49 [0.29, 0.68]	0.46 [0.20, 0.72]
Muscle tension	0.57 [0.34, 0.81]	0.36 [0.21, 0.52]	0.61 [0.40, 0.82][a]
Total points	0.54 [0.42, 0.67]	0.48 [0.37, 0.58]	0.54 [0.43, 0.65]

[b] < 0 poor agreement.
0–0.20 slight agreement.
0.21–0.40 fair agreement.
0.41–0.60 moderate agreement.
0.61–0.80 substantial agreement.
0.81–1.00 almost perfect agreement, (Landis and Koch, 1977).
[a] one missing data.

Results

Demographics

The CCNs were 25–59 (Md 38.5, IQR 30–48) years old, with work experience in intensive care ranging from 11 months to 30 years (Md 8 years, IQR 4–16 years). The time interval between taking the two tests ranged from 1 day to 236 days (Md 23, IQR 7–73). Most were female (85%, n = 41). The majority (58%, n = 28) had a bachelor's degree in nursing, 38% (n = 18) had a college degree in nursing and 4% (n = 2) had a master's degree in nursing. Of the 48 CCNs, 58% (n = 28) reported having previous education about pain management, while 46% (n = 22) reported previous education about pain scales. This education had not concerned ICU patients. The CPOT was familiar to two CCNs before this study. Most of the CCNs (85%, n = 41) watched the education video only once.

Knowledge tests—CCNs' understanding of the CPOT

The first knowledge test was taken by all 48 CCNs and the second by 46, as two CCNs dropped out. After the first CPOT assessment, the total scores ranged from 8 to 12 points, with a mean of 9.8 (SD 1.2), and after the second CPOT assessment from 7 to 12 points, with a mean of 9.9 (SD 1.2). The time interval between taking the two tests ranged from 1 day to 236 days (Md 23 days). The scores did not differ statistically between the first and the second knowledge tests ($p = 0.236$). A majority of the statements had more than 66% correct answers on the first test (range 29%–100%) and more than 75% correct answers on the second (range 27%–100%). The same two statements, nos. 1 and 10, were most frequently answered incorrectly on both knowledge tests (Table 1).

Questionnaire—adequacy of the instructions

The CCNs considered the length of the training time for CPOT use sufficient at both measurement points (mean 3.2 (SD 0.7) and 3.4 (SD 0.6)). The instructions about CPOT use were considered sufficient to very clear (mean 3.6 (SD 0.5) and 3.5 (SD 0.5), respectively).

Interrater reliability—CCNs' skills in using the CPOT

The CCNs and the researcher assessed 69 patients with the CPOT. The first assessment was performed by 48 and the second by 46 CCNs. The weighted kappa for the total CPOT score before (κ 0.54, CL [0.42, 0.67]), during (κ 0.48, CL [0.37, 0.58]) and after (κ 0.54, CL [0.43, 0.65]) the painful procedure reached a moderate level of agreement. When weighted kappa values for the first and second assessments were compared, no differences were detected except in the body movements category. The weakest agreement levels were reached in facial expression before the procedure and in muscle tension during the procedure. The weighted kappa coefficient values for the procedure (suctioning) are presented in Table 2.

CCNs' experiences with the video education method

Most of the CCNs perceived video education as a positive (13/20) or neutral experience (4/20), though some (3/20) had reservations about video education. The CCNs considered it feasible for CPOT training, as it had the potential to reach all nursing staff more effectively than for instance lectures.

> *"The video was an effective method to teach a lot of people, as you could watch it at your convenience; I mean, if you just would have had a couple of lectures, would it then have reached such a large amount of people?"1:26*

Video education was perceived as a positive experience by the CCNs because they valued learning from demonstrations. CCNs described this as learning by watching, which they thought was better than just reading instructions. It gave them a similar kind of experience as learning at the patient's bedside, with the privacy and possibility to focus solely on the learning. The video demonstrated patients' pain well since the examples of patients' pain appealed to the CCNs' emotions and made them more aware of pain and its management.

> *"It was nice because it was a bit like a demonstration at the patient's bedside, but you were able to watch it at your own convenience." 6:6*

> *"It had a strong effect on emotions since it had real patients in real situations. It made me more aware of the fact that the patient really has a lot of pain in just a normal care situation. . . I feel that after the video I have paid much more attention to giving pain medication, more often and sufficiently." 1:26*

The CCNs considered the visual–auditory learning experience of the video education beneficial for learning, though their personal preferences for how they would learn best varied. Some CCNs wished for interaction and discussion with colleagues during education, whereas others preferred passive learning methods, such as lectures. Nevertheless, video education was considered at least valuable supporting material in learning.

> *"You are able to remember all visual stimuli more easily than things you just hear."10:24*

> *"Well, I think the video education method was alright, but in my experience, the best method is to do it together with someone and look and talk through it together; that's how you learn best." 3:29*

The CCNs perceived video education as feasible since they could freely choose when to watch the video. Most CCNs (15/17) reported that it was easy to find the time for it, for example, during night shifts. During day shifts some CCNs found it challenging to watch the video since they felt obligated to stay at patients' bedside or had trouble concentrating on the video because of their other duties. The possibility to watch the video at patients' bedside would have been helpful according to the CCNs.

> "*It suited well because you could watch it when you had time, and it was short and easy—everything clearly explained, nothing was unclear. You watched it, and if you don't remember, you could watch it many times." 3:29*

In regards to the limitations of the video education, the CCNs mentioned that it felt distant, with no possibility to ask questions. The CCNs also mentioned that without somebody verifying that they watch the video, not everybody would watch it.

> *"When you had some questions about the video or when making pain assessments later, it would have been good if you could check things from somewhere." 1:26*

CCNs' experiences with the education video

The CCNs described the video as clear (15/18), simple and understandable. Although a few CCNs considered the video too long to maintain their interest, half of them considered the length convenient. Some CCNs felt that the real patient examples from abroad were artificial, strange and old, while others perceived them as concrete and illustrative. One CCN explained that it felt like watching a patient from a relative's perspective, making it possible to focus on problems in the patient's care.

> *"The video was extremely well executed; there was nothing unnecessary or excessive. It was systematically taught how to do it. I did not experience it would have been too long." 7:21*

After the video education, the CCNs described the CPOT as easy to use. Some CCNs explained that after the education they were better able to assess a patient's pain and had more knowledge about it. According to the CCNs (8/18), the presence of the researcher during the pain assessments was helpful in rehearsing the use of the CPOT. Some CCNs (4/20) expressed that discussion about the pain scoring during the assessments would have been helpful for their learning.

"*At least for me, it was sufficient to watch it once to understand the matter.*" *8:8*

Discussion

In this study, the impact of video education on CCNs' knowledge and skills in using the CPOT was evaluated and CCNs' experiences with video education were explored. The results indicated that the CCNs gained good knowledge of the principles of the tool and reached a moderate level of skills in CPOT use after the education they received. The CCNs' experience with the education method was positive for the most part.

With video education, the CCNs learned the principles of how to use the CPOT for pain assessment as indicated by the knowledge tests, where a majority of the statements had more than 66% correct answers on the first test and more than 75% correct answers on the second test. The effect of increased knowledge after education is in line with previous studies (i.e. Lucas and Knobel, 2012; Scott et al., 2013). Additionally, in the interviews, the CCNs expressed that they also felt they had learned to use the CPOT and felt fairly confident in being able to use it adequately.

The CCNs' skills in using the CPOT after the education they received was evaluated by examining the agreement on pain assessment made with the CPOT between the CCNs and the researcher, who was considered an expert in using the tool. The results of a mostly moderate level of the interrater reliability of pain assessment with the CPOT is lower than in previous research (Buttes et al., 2014; Gélinas et al., 2006; Gélinas et al., 2011). However, Keane (2013) found agreement levels for the CPOT similar to this study and in Marmo and Fowler's (2010) study, the agreement regarding airway suctioning, the same procedure used in this study, ranged from 56% to 92%. The disagreement on assessments was explained to be the result of using several raters (Keane, 2013) and due to the difficulty of scoring the facial component (Keane, 2013; Marmo and Fowler, 2010), especially during suctioning (Marmo and Fowler, 2010). It is noteworthy that using the same two raters, as was done in other studies (Buttes et al., 2014; Gélinas et al., 2006), is not comparable to what was done in this study, either, where agreement was examined between the researcher and several CCNs who were acting as second raters. Furthermore, assessing video-taped patients, which was done in Gélinas et al. (2011) study, differs from the assessments done in clinical situations with various patients in this study. In addition, the CCNs assessed pain while performing airway suctioning. Various clinical and nurse variables can influence the reliability of pain assessment with the CPOT in clinical practice (Buttes et al., 2014; Keane, 2013). Indeed, the results could suggest that it is more difficult to focus on patient observation while performing a procedure.

The moderate level of skills in CPOT use, indicated by the interrater reliability results, is somewhat in conflict with the experience of the CCNs who reported that they had received sufficient instruction and time for learning and also reported feeling fairly confident in being able to use the CPOT after receiving their video education. In clinical practice, the gap between perceived and actual skills in pain management, which Wang and Tsai (2010) also reported, needs to be considered. A subjective assessment of user skills may be misleading. Evaluating skills in using patient assessment tools by examining the interrater reliability of assessment have been utilised previously (Gélinas et al., 2011; Lucas and Knobel, 2012 Lucas and Knobel, 2012). More commonly, the understanding of assessment tools after training is evaluated from the perspective of an increased level of knowledge (Lucas and Knobel, 2012; Scott et al., 2013), the increased use of assessment tools, the frequency of pain assessments (Riekerk et al., 2009; Gélinas et al., 2011; Scott et al., 2013 Scott et al., 2013) or a positive attitude change towards pain assessment (Riekerk et al., 2009; Scott et al., 2013). The results of this study indicate the need to also ensure the actual clinical skills in using assessment tools.

Video education was described as mainly positive, although the CCNs requested the opportunity to interact during learning. Some CCNs would have preferred lectures as a learning method and needed reminders to watch the video. The CCNs also expressed the need for external control to be engaged in learning. This raises questions about the self-directedness in CCNs' learning culture. Nurses may value self-directed learning but they may also experience learning as being detached from clinical work. Nurses' perceptions of learning need to be challenged and supported. (Govranos and Newton, 2014.) CCNs need motivation and encouragement to engage in learning and especially self-directed learning. It is also important to enable their education by eliminating external barriers to the education, for example, by allowing time for it and by creating an environment that encourages education and learning.

The development of CCNs' skills in pain assessment has scarcely been studied. Nurses' experience and competence influence their clinical reasoning concerning pain (Gerber et al., 2015), and attaining adequate clinical skills in general is a process that requires experience and education (Lejonqvist et al., 2012). After completing the video education, the CCNs reached an advanced beginner level, still needing support in using the tool. To become competent users they would need more practice and training (Benner, 1984). The training could benefit from interaction and feedback on the assessments, as training including interaction have had positive effects on pain assessment knowledge (Lewis et al., 2015). The CCNs in this study also wished for discussions related to the pain assessments.

Study limitations and strengths

The limitations and strengths of the design should be considered. The variations in the time interval between the two pain assessments could have affected CCNs' skills in using the CPOT. Controlling the time interval between assessments was challenging due to the nature of CCNs' shift work and due to difficulties in finding patients not too deeply sedated and who needed suctioning for clinical purposes. However, the median of 23 days describes the typical interval between the assessments. This is supported by the fact that the knowledge test scores did not differ statistically between the assessments. Additionally, the repetition of the scale before assessments suggests that the results are not solely based on the effects of the video education. In the future, more controlled study designs with a control group are recommended. In this study, a baseline measurement of knowledge and skills was not made, as the CCNs had no previous knowledge or experience of the CPOT. In future possible studies such as this, a baseline measurement could be indicated, as the Finnish CCNs are now more familiar with the CPOT.

In qualitative research, trustworthiness is evaluated based on credibility, dependability and transferability (Graneheim and Lundman, 2004). The credibility of the findings is supported by the data saturation, the systematic data analysis that is authentic to participants' experiences and the agreement of the analysis among three researchers. To ensure dependability, the progress of the study was described in detail. This study was conducted in one ICU, and as a result of the sampling method used, CCNs who were especially interested in the subject may have agreed to participate, even though the interviews indicated that CCNs with reservations towards video education also participated in the study. This limits the transferability of the results; however, the study might indicate how CCNs in other ICUs could experience video education.

Although the interview data were not in depth, they supported and gave context to the quantitative data. Using interrater reliability calculations to objectively examine the learning achievements of the CCNs gives additional value to this study.

Conclusions

Video education is useful for teaching CCNs the principles of behavioural pain assessment tool use. However, in order for CCNs to reach adequate skills in using the tool, additional clinical training, including interaction and feedback, is required. The gap between perceived and actual skills in using the tool suggests that objective means are needed to verify users' skills after training. The ICU learning culture and the motivations of CCNs for learning need to be further explored.

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