Study of Nurses' Attitudes and Practices towards Pain Evaluation in Nonverbal Patients

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Abstract

Pain, and the appropriate treatment of it, has recently come to the forefront of issues addressed with healthcare providers. Since the cornerstone of pain management is an appropriate assessment, methods of accurate pain evaluation are necessary. This need is particularly important in the population of patients who cannot express their pain. While pain assessment tools are available for use with nonverbal patients and hospitals typically mandate the use of one of these tools, actual compliance with such policy may not actually occur. Various barriers, such as education in the use of a tool, time, and the personal views of the nurse, may interfere with the use of such tools. This study utilizes a survey to evaluate the attitudes and practices of ICU nurses towards the use of pain assessment tools in nonverbal patients. Ninety-two percent of participants reported use of a pain assessment tool, and 72% reported using one at least 50% of the time. Sixteen (64%) of participants considered nursing workload to be a barrier to the use of pain assessment tools for nonverbal patients at least 50% of the time. No correlation was found between years of experience and the use of a pain assessment tool. The data collected in this study identifies current nursing practice so that future care in the area of pain assessment and management in non-communicative patients can be improved.

Study of Nurses' Attitudes and Practices towards Pain Evaluation in Nonverbal Patients

According to The Joint Commission, over 76 million individuals in the United States currently suffer from pain (The Joint Commission, 2016). Pain, especially when it goes untreated or undertreated, can have numerous negative effects on various body systems. When pain is experienced, the sympathetic nervous system (SNS) of the body is triggered, producing a fight-or-flight response. The SNS works with the endocrine system, so the resulting systemic response is closely tied to the release of hormones in response to stimulation. Hormones are released from the hypothalamus, and then the pituitary gland, to prepare the body to deal with the injuring agent (Lewis, 2014).

Many body systems are affected by this release of hormones. The release of epinephrine and norepinephrine increases heartrate and stroke volume of the heart to facilitate perfusion of the vital organs (Dunwoody, Krenzischek, Pasero, Rathmell, & Polomano, 2008). Perfusion is also maintained by an increase in blood pressure, caused by peripheral vasoconstriction in response to epinephrine and norepinephrine and fluid retention in response to increased levels of renin, aldosterone, and antidiuretic hormone (Lewis, 2014). As the activity of the heart is increased, its oxygen demand also increases (Dunwoody, Krenzischek, Pasero, Rathmell, & Polomano, 2008). The body compensates by elevating respiratory rate in an attempt to obtain the oxygen needed by the body tissues. The presence of pain may decrease the depth of respirations and the individual's ability to cough effectively, leading to secretion accumulation and alveolar collapse, as well as a decrease in the amount of oxygen absorbed in the lungs (Kindler & Polomano, 2014). The stress response also causes an increase in cortisol production, which, in addition to various other mechanisms, elevates the amount of available glucose in the

blood stream (Dunwoody et al., 2008; Lewis, 2014). Cortisol production also causes a suppression of the immune system (Lewis, 2014). Activation of the SNS decreases gastrointestinal motility, which may lead to the development of a paralytic ileus, and may ultimately affect the nutritional status of the patient (Shahriari, Golshan, Alimohammadi, Abbasi, & Fazel, 2015). While these mechanisms allow the body to cope with pain in the moment, as pain remains untreated, they become unsustainable and eventually are unable to continue to meet body needs (Lovin, 2016b).

The negative effects of untreated pain surpass physiologic processes. One study revealed that the presence of pain may affect an individual's ability to multitask. In the study, pain did not affect participants' ability to perform the primary task of cooking, but did impact the secondary task of setting a table. This study also suggests that pain negatively impacts the processing strategies used by the individual when completing a task (Keogh, Moore, Duggan, Payne, & Eccleston, 2013). Another review reports that in individuals with chronic pain, higher levels of pain during data collection were related to lower performance on cognitively demanding tasks (Vlaeyen, Morley, & Crombez, 2016). The emotional status of the individual may also be significantly affected when pain goes untreated. Individuals may respond to the insecurity and perceived lack of control with anger, fear, sadness, and various other emotions unique to the individual (Kindler & Polomano, 2014; Lovin, 2016b).

According to Pasero and McCaffery (2011), "failure of clinicians to ask patients about their pain and to accept and act on patients' reports of pain are probably the most common causes of unrelieved pain and unnecessary suffering" (p. 15). Despite this observation, the long-term effect of pain assessments on clinical outcomes is unclear.

While some studies have shown improvements in patient care resulting from pain assessment, others studies indicate "no significant differences between experimental and control groups with respect to medications prescribed or overall pain intensity" following systematic pain assessment (Pasero & McCaffery, 2011, p. 161). One meta-analysis concluded that the use of pain assessment tools can affect the intensity of pain experienced by critically ill patients, as well as impact the use of pharmacologic interventions and the frequency of pain assessment and documentation (Georgiou, Hadjibalassi, Lambrinou, Andreou, & Papathanassoglou, 2015). The same study, along with others, recognizes the need for further research to determine the effects of the use of such tools on long-term clinical outcomes (Gélinas, 2016; Georgiou et al., 2015). Regardless of long-term differences in patient outcomes, pain assessment is critical in providing appropriate pain management (Pasero & McCaffery, 2011). Accurate assessment of pain is necessary not only to provide adequate pain relief, but also to prevent overtreatment of pain and related adverse effects such as respiratory suppression, oversedation, and in some cases, death (Chen & Chen, 2015).

The ideal method of pain assessment is the patient's own report of his or her pain level (Chen & Chen, 2015; Gélinas, 2016; Rijkenberg, Stilma, Endeman, Bosman, & Oudemans-van Straaten, 2015). However, there are certain populations, especially in the critical care setting, who are unable to provide a verbal pain report or even signals to verify the presence of pain. Examples of such populations include individuals receiving mechanical ventilation and those receiving sedatives or with a decreased level of consciousness (Rijkenberg et al., 2015). While it may be tempting to assume that such patients experience less pain since they do not express it, various studies have shown that

patients who are unable to express their pain due to critical illness or unconsciousness do still perceive pain (Pasero & McCaffery, 2011). The reports of the pain experienced, gathered after the fact from the patients, are sobering (Pasero & McCaffery, 2011). In order to accurately assess the pain of these patients, it is imperative to utilize accurate alternatives to the patient's self-report of pain. Standardization of a single pain evaluation tool for nonverbal patients has been difficult because pain may produce varied physiological, psychological, or behavioral responses (Chen & Chen, 2015). Thus, "no pain assessment instrument has been universally recommended for use in critically ill patients incapable of self-reporting" (Stites, 2013, para. 2).

Two of the major tools used to assess pain in the nonverbal critically-ill population are the Behavioral Pain Scale (BPS) and the Critical-Care Pain Observation Tool (CPOT) (Pasero & McCaffery, 2011). The BPS was developed specifically for populations of sedated or mechanically ventilated patients (Al-Darwish, Hamdi, & Fallatah, 2016). This scale obtains a pain score of three to twelve by evaluating three categories: facial expression, upper limb movement, and compliance with a ventilator. Each category may be assigned a score from one to four. Specifications are provided regarding what actions on the part of the patient correspond to each numerical value within a category (Al-Darwish et al., 2016). The CPOT provides a pain score from zero to eight based on a four-category system. The categories included are facial expression, body movements, muscle tension, and either compliance with a ventilator if the patient is intubated or vocalization if the patient is not intubated. Each category may receive a score from zero to two. Specific definitions are provided for each numeric value in the

categories to promote objectivity in the evaluation (Al-Darwish et al., 2016; Lovin, 2016a; Rijkenberg et al., 2015).

Studies evaluating the BPS have supported its interrater reliability, validity, and internal consistency (Stites, 2013). The interrater reliability of the tool was demonstrated by calculated weighted kappa values of 0.81 – 0.955 (Chanques et al., 2014; Liu, Li, & Herr, 2015). One study particularly revealed the interrater reliability of each of the subscales of the BPS, with *r* values ranging from 0.90 to 0.95 with the different categories (Al Darwish et al., 2016). The discriminant validity of the tool was supported by an average two point increase in the pain score between the score at rest and that obtained during a painful procedure (Rijkenberg et al., 2015). The internal consistency of the BPS has also been established, with reported Cronbach's alpha scores ranging from 0.70 – 0.80 (Chanques et al., 2014; Liu, Li, & Herr, 2015; Rijkenberg et al., 2015). One study examining nurses' perceptions of the perceived accuracy, usefulness, and ease of learning of pain assessment tools reported scores of seven, seven, and eight on a scale of zero to ten respectively for the BPS (Chanques et al., 2014; Lovin, 2016a).

Various studies have been performed over the last five years to examine the value of the CPOT for use in clinical practice. One significant benefit of this tool is that it has been evaluated in both specific and general critically ill populations (Buttes, Keal, Cronin, Stocks, & Stout, 2014). Pasero and McCaffery (2011), experts in the field of pain management, prefer the CPOT over the BPS due to the fact that it contains more categories of evaluation, and because it distinguishes patients who are intubated from those who are not. Studies performed in the clinical setting to test psychometric properties of the CPOT or to compare it to other pain assessment tools have established

the discriminant validity of the tool, as shown by two to three point differences in pain scores between those taken at rest and those obtained during a painful procedure (Kanji et al., 2016; Rijkenberg et al., 2015). Studies support the internal consistency of the tool, with Cronbach's alphas ranging from 0.71 – 0.81 (Chanques et al., 2014; Kanji et al., 2016; Liu, Li, & Herr, 2015; Rijkenberg et al., 2015). Calculations of the weighted kappa to determine interrater reliability ranged from 0.81 - 0.973 (Chanques et al., 2014; Liu, Li, & Herr, 2015). One study examining the accuracy, usefulness, and ease of learning of various pain assessment tools reported that nurses scored the CPOT as an eight, eight, and eight on a scale of zero to ten for each category respectively (Chanques et al., 2014; Lovin, 2016a).

While some research has concluded that the BPS is the best tool for the assessment of pain in nonverbal patients (Al Darwish et al., 2016), other sources strongly support the use of the CPOT in such clinical situations (Buttes et al., 2014; Kanji et al., 2016; Keane, 2013; Pasero & McCaffery, 2011; Rijkenberg et al., 2015; Stites, 2013). Some studies, in which both tools were evaluated simultaneously and comparisons were drawn between calculated psychometric properties or the pain scores obtained, recommend both tools for pain evaluation in critically ill patients (Barr et al., 2013; Chanques et al., 2014; Liu, Li, & Herr, 2015). While further research will be needed to determine the most effective pain assessment tool in non-communicative patients, most current studies favor the use of the CPOT (Lovin, 2016a).

Standardization of a nonverbal pain assessment tool is not the only factor necessary to ensure appropriate assessment of pain in this population: "Research has demonstrated that simply implementing the use of an assessment tool in clinical practice

is not sufficient to change practice; theory-based interdisciplinary strategies to address pain assessment and pain management in the critical care environment are needed" (Keane, 2013, Implications, para. 3). While various studies have assessed the attitudes and practices of healthcare professionals towards the use of pain assessment tools in different countries and in the pediatric population, the number of studies assessing this topic in adult nonverbal patients in the United States is limited. A questionnaire administered to 52 nurses with varying levels of experience and education in a hospital in the Midwest revealed the belief held by some nurses that "the tools were subjective and inaccurate," as well as the fact that "the tools could be improved and were not necessarily considered reliable" (Young, Horton, & Davidhizar, 2006, para. 45). This same study demonstrated that, while small, the amount of education received on the use of a particular pain assessment tool was related to a more positive outlook on the benefits of such a tool (Young et al., 2006).

In 2011, Rose et al. conducted a survey in a hospital in Canada, assessing nursing attitudes and practices regarding pain management. After being unable to find an appropriate preexisting tool to use, the investigators developed their own survey, which was reviewed by experts before use. Results of the study demonstrated that only 45.7% of the 140 nurses who returned surveys used a pain assessment tool for patients unable to provide a self-report of pain, compared to a 98.6% use of pain assessment tools with patients who could self-report. At the hospital in which the study was conducted, policy dictated that the numerical rating scale (NRS) was to be used for patients able to self-report; however, no particular pain assessment tool was recommended for use in nonverbal patients. The survey also assessed nurses' views of factors that enabled or

presented a barrier to pain assessment. The three most significant barriers to pain assessment across the board were hemodynamic instability, the inability of patients to self-report pain, and nurse workload. Nurses with more experience tended to use pain assessment tools in non-communicative patients less than did nurses with fewer years of experience (Rose et al., 2011).

In 2012, the survey used in the study discussed above was modified slightly and administered to intensive care unit (ICU) nurses across the country of Canada. While 94% of the 802 nurses who returned surveys that could be evaluated agreed that it is equally important to assess and document pain for both communicative and non-communicative patients, only 33% of these individuals reported using a pain assessment tool more than 50% of the time for non-communicative patients. The researchers concluded that "a substantial proportion of the nurses…were unaware of practice recommendations published by professional societies for pain assessment and management in critically ill adults" (Rose et al., 2012, p. 257). While education was one of the major factors in the limited use of pain assessment tools in non-communicative patients, this study also revealed that many nurses did not consider a significant number of the behaviors assessed by behavioral pain assessment tools to actually be indicative of pain. Since this aspect of the tools did not align with prior knowledge and experience, nurses may have be reluctant to use behavioral pain scores for pain assessment (Rose et al., 2012).

The current study evaluates the attitudes and practices of nurses from the ICUs at a 385-bed hospital in Central Virginia, according to the model utilized by Rose and colleagues during the 2011 and 2012 studies. The hospital's policy does not provide

specific instructions regarding the use of a particular pain assessment tool for non-communicative patients; time, personal bias, or lack of adequate education in available tools, amongst other factors, may limit the actual usage of such tools in the critical care setting. The primary objective of this study is to determine whether or not nurses use pain assessment tools in their pain assessments of non-communicative patients and if so, how frequently such tools are used. The secondary objective is to identify barriers to the use of these tools in nonverbal patients. Finally, possible correlations will be examined between pain assessment practices and the years of experience of the study participants (Rose et al., 2011).

Method

Tools

Data were gathered using a survey, modified from one designed and used by Rose et al. (2012). The original study evaluated the attitudes and practices of nurses regarding pain assessment in both verbal and nonverbal patients. Most of the questions on the survey use a Likert Scale to evaluate the frequency with which a participant performs a specific action. For example, one question asks participants to indicate the frequency with which they use a pain assessment tool for patients unable to communicate pain. Options for responses include never (0%), seldom (1 – 25%), sometimes (26 – 50%), often, (51 – 75%), and routinely (>75%) (Rose et al., 2012).

After obtaining permission from Dr. Rose, the survey was modified for the current study to include only questions addressing pain assessment in nonverbal patients as well as the demographic portion of the survey. Additionally, one question in the original survey that evaluated barriers to pain assessment in general was modified for use

in this study to specifically address barriers to the use of pain assessment tools in nonverbal patients. The alteration to this question was clearly noted on the modified survey. The modified survey was evaluated for content validity by four faculty members at Liberty University with a background in critical care. There were no significant recommended changes to the modified survey. Approval for the study was obtained from the Institutional Review Boards of both Liberty University and the hospital at which the study was conducted.

Participants

The study was conducted at a 385-bed hospital in Central Virginia. ICU nurses were selected as the sample population since they have more experience taking care of non-communicative patients than do nurses in various other hospital units. Thirty-one surveys were distributed to nurses working in three of the four ICUs. After administration of the survey, a total of 26 surveys were returned. One survey included personally identifiable information and was removed from further analyses, resulting in a final sample of 25. The experience of the participants as nurses and as nurses in an ICU ranged from less than two to greater than ten years (see Table 1).

Table 1

Participant Experience

	Experience as a nurse	**Experience as an ICU nurse**
<2 years	5 (20%)	7 (28%)
2 - 5 years	8 (32%)	7 (28%)
5 - 10 years	4 (16%)	4 (16%)
>10 years	8 (32%)	7 (28%)

Seventeen (68%) participants reported having obtained a Bachelor's of Science in

Nursing. Three (12%) participants had obtained a Master's degree, and six (24%) were Critical Care Certified Nurses.

Study Implementation

The unit managers of each of the four ICUs at the hospital (Neuro ICU, Medical ICU, Cardio Thoracic ICU, and Surgical Trauma ICU) were contacted via email for permission to recruit nurses from each unit. The email suggested several means of data collection and offered the opportunity for each manager to provide other recommendations. Data collection strategies were tailored for each unit according to the manager's feedback. Data were collected from the Cardio Thoracic ICU by administration of the survey at a leadership meeting. At the suggestion of the Medical ICU manager, surveys were administered during the night shift to the nurses available on the unit at that time. Data were gathered from the Surgical Trauma ICU by administration of the survey by the researcher at a staff meeting. No data were collected from the Neuro ICU since it did not have any scheduled meetings during the time allotted for data collection.

Study information was presented to participants, and surveys were distributed by the primary investigator. Participants were instructed to read the cover page, which provided details about the survey and necessary information for informed consent. A waiver of signed informed consent was obtained from both Liberty University's and the hospital's IRBs since a signature on the informed consent document would be the sole link between the data and a specific individual. Preservation of the anonymity of data was considered crucial to encourage participants to answer the questions according to actual clinical practice. Completed surveys were returned in large envelopes and collected

directly by the researcher. Surveys left on the unit for individuals to take later were sealed in the provided envelopes and collected as previously agreed with the unit manager from her office.

Results

Statistical Analysis

Data were analyzed using IBM SPSS 24 software. The majority of analysis consisted of computing the frequency of certain attitudes, beliefs, or pain assessment practices. A Spearman correlation coefficient was calculated to examine the correlation between years of experience of the participant and use of pain assessment tools, as well as between years of experience and perceived importance of the use of assessment tools in the pain assessment of nonverbal patients.

Nurses' Use of Pain Assessment Tools

Most participants (n = 21, 84%) reported assessing and documenting pain between every one and four hours. An additional three participants (12%) reported that they assess and document pain at least every hour. Out of the 25 participants included in the study analysis, 23 (92%) reported use of a tool for pain assessment in nonverbal patients. Fifty-six percent of individuals reported routine use of a pain assessment tool (more than 75% of the time), and an additional 16% reported that they use a tool often (51-75% of the time). Use of a pain assessment tool was considered extremely important by 56% of the participants, and at least moderately important by a total of 76%. Eighteen participants (72%) reported using the Nonverbal Pain Scale (NVPS). Use of the Behavioral Pain Scale (BPS) was reported by five participants (20%). The PAIN algorithm and the Pain Behavior Assessment Tool (PBAT) were each used by one

participant, and the FACES and a "nonverbal" tool were each used by two participants. No participants reported use of the Behavioral Pain Rating Scale (BPRS), Critical-Care Pain Observation Tool (CPOT), or checklist of non-verbal pain indicators (CNPI).

Table 2

Use of Various Pain Assessment Tools for Nonverbal Patients

Pain Assessment Tool	Individuals Reporting Tool Use
Nonverbal Pain Scale (NVPS)	18 (72%)
Behavioral Pain Scale (BPS)	5 (20%)
PAIN algorithm	1 (4%)
Pain Behavior Assessment Tool (PBAT)	1 (4%)
Behavioral Pain Rating Scale (BPRS)	0 (0%)
Critical-Care Pain Observation Tool (CPOT)	0 (0%)
Checklist of Nonverbal Pain Indicators (CNPI)	0 (0%)
FACES	2 (8%)
"nonverbal"	2 (8%)

Participants were asked to rate certain behaviors as never (0% of the time), seldom (1 – 25% of the time), sometimes (26 – 50% of the time), often (51 – 75% of the time), or routinely (>75 % of the time) indicative of pain. Behaviors reported as routinely indicative of pain by at least 50% of the participants included vocalization (56%), splinting (60%), grimacing (72%), wincing (72%), clenching (56%), and guarding (56%) (see Table 3).

Table 3

Behavioral Indicators of Pain

Column1	Never (0%)	Seldom (1 - 25%)	Sometimes (26 - 50%)	Often (51 - 75%)	Routinely (>75%)
Closing eyes	7 (28%)	9 (36%)	9 (36%)	0 (0%)	0 (0%)
Rigidity	1 (4%)	0 (0%)	6 (24%)	11 (44%)	7 (28%)
Vocalization	0 (0%)	0 (0%)	3 (12%)	8 (32%)	14 (56%)

Brow lowering/frowning	0 (0%)	0 (0%)	3 (12%)	9 (36%)	12 (48%)
Fighting ventilator/activation of alarms	0 (0%)	1 (4%)	1 (4%)	11 (44%)	12 (48%)
Splinting	0 (0%)	0 (0%)	4 (16%)	5 (20%)	15 (60%)
Grimacing	0 (0%)	0 (0%)	1 (4%)	6 (24%)	18 (72%)
Wincing	0 (0%)	0 (0%)	1 (4%)	6 (24%)	18 (72%)
Clenching fists/teeth	0 (0%)	0 (0%)	4 (16%)	7 (28%)	14 (56%)
Sighing	2 (8%)	8 (32%)	6 (24%)	8 (32%)	1 (4%)
Slow cautious movements	0 (0%)	4 (16%)	11 (44%)	8 (32%)	2 (8%)
Retraction of upper limbs	1 (4%)	4 (16%)	11 (44%)	8 (32%)	1 (4%)
Trying to climb out of bed	5 (20%)	9 (36%)	7 (28%)	3 (12%)	1 (4%)
Repetitive touching of area of the body	0 (0%)	4 (16%)	7 (28%)	8 (32%)	6 (24%)
Seeking attention through movements	2 (8%)	7 (28%)	11 (44%)	5 (20%)	0 (0%)
Pulling ET tube	0 (0%)	8 (32%)	9 (36%)	6 (24%)	2 (8%)
Striking staff	3 (12%)	9 (36%)	11 (44%)	2 (8%)	0 (0%)
Attempting to sit up	2 (8%)	6 (24%)	9 (36%)	8 (32%)	0 (0%)
Thrashing limbs	0 (0%)	1 (4%)	11 (44%)	10 (40%)	2 (8%)
Resistance to passive movements	0 (0%)	2 (8%)	5 (20%)	12 (48%)	5 (20%)
Not following commands	2 (8%)	10 (40%)	10 (40%)	2 (8%)	1 (4%)
Withdrawing	0 (0%)	5 (20%)	6 (24%)	7 (28%)	7 (28%)
Guarding	0 (0%)	0 (0%)	2 (8%)	9 (36%)	14 (56%)
Restlessness	0 (0%)	1 (4%)	4 (16%)	13 (52%)	7 (28%)
Arching	1 (4%)	3 (12%)	6 (24%)	5 (20%)	10 (40%)

All of the participants considered physiologic indicators to be at least moderately important in the assessment of pain in nonverbal patients, with 76% believing them to be extremely important. When given an option to provide other physiologic indicators of pain, 12 participants (48%) reported the belief that changes in vital signs, most commonly an increase in respiratory rate and heart rate, were indicative of pain.

Barriers to the Use of Pain Assessment Tools in Non-communicative Patients

The only factor considered to be a barrier to the use of pain assessment tools in nonverbal patients often or routinely by at least 50% of participants was nursing workload. Patient instability was considered a barrier by 80% of the participants at least sometimes (see Table 4).

Table 4

Barriers to the Use of Pain Assessment Tool in Nonverbal Patients

	Never (0%)	**Seldom (1 - 25%)**	**Sometimes (26 - 50%)**	**Often (51-75%)**	**Routinely (>75%)**
Nurse workload	1 (4%)	4 (16%)	4 (16%)	11 (44%)	5 (20%)
Availability of pain assessment tools	6 (24%)	8 (32%)	7 (28%)	3 (12%)	1 (4%)
Education in the use of pain assessment tools	7 (28%)	6 (24%)	9 (36%)	3 (12%)	0 (0%)
Familiarity with pain assessment tools	6 (24%)	8 (32%)	7 (28%)	3 (12%)	1 (4%)
Hemodynamic instability of patient	1 (4%)	4 (16%)	9 (36%)	7 (28%)	4 (16%)
Lack of guidelines in the use of tools	7 (28%)	12 (48%)	4 (16%)	2 (8%)	0 (0%)
Lack of priority given to pain assessment	11 (44%)	10 (40%)	2 (8%)	1 (4%)	1 (4%)

Years of Experience and Pain Assessment Practices

The correlation between years of experience as a nurse and the perceived importance of using a pain assessment tool to evaluate pain in the nonverbal population was statistically nonsignificant, with a Spearman correlation coefficient of 0.216 (p = 0.300). Additionally, no correlation was found between years of experience and the frequency of pain assessment tool use, with a Spearman correlation coefficient of -0.174 (p = 0.404).

Table 5

Correlation of Pain Assessment Tool Use and Experience

			Experience as a nurse	Frequency of pain assessment tool use
Spearman's rho	Experience as a nurse	Correlation Coefficient	1.000	-.174
		Sig. (2-tailed)	.	.404
		N	25	25
	Frequency of pain assessment tool use	Correlation Coefficient	-.174	1.000
		Sig. (2-tailed)	.404	.
		N	25	25

Table 6

Correlation of Perceived Assessment Tool Importance and Experience

			Importance of using a pain assessment tool	Experience as a nurse
Spearman's rho	Importance of using a pain assessment tool	Correlation Coefficient	1.000	.216
		Sig. (2-tailed)	.	.300
		N	25	25
	Experience as a nurse	Correlation Coefficient	.216	1.000
		Sig. (2-tailed)	.300	.
		N	25	25

Discussion

Nurses' Use of Pain Assessment Tools

As previously stated, untreated pain has many negative consequences for the patient, and while the precise effect of pain assessment on long-term patient outcomes is unclear (Gélinas, 2016; Georgiou et al., 2015), it plays a crucial role in the provision of appropriate pain management (Pasero & McCaffery, 2011). Accurate assessment of pain is necessary to provide adequate pain relief and to prevent overtreatment of pain and related adverse effects (Chen & Chen, 2015). Twenty-four (96%) of the participants in this study reported that they assess and document pain at least every four hours.

While a subjective report is the ideal method for pain assessment (Chen & Chen, 2015; Gélinas, 2016; Rijkenberg et al., 2015), alternative methods, such as pain assessment tools, must be used for patients unable to communicate their pain. Twenty-three (92%) of the participants in this study reported use of a pain assessment tool. This result is consistent with recommended practice, and while further research is needed to determine the effects of pain assessment tool use on long-term outcomes, studies indicate that these tools "can have a positive impact on the intensity of pain experienced by critically ill individuals," as well as on the use of pharmacologic interventions and the frequency of pain assessment and documentation (Georgiou et al., 2015, para. 46). Fifty-six percent of individuals reported routine use of a pain assessment tool (more than 75% of the time), and an additional 16% reported that they use a tool often (51-75% of the time). In total, 72% of participants reported using a pain assessment tool for nonverbal patients over 50% of the time, compared to the 33% of nurses who reported use of a behavioral tool over 50% of the time for pain assessment of their nonverbal patients in the study

conducted by Rose et al. (2012). In that study, 74% of participants considered behavioral pain assessment to be moderately or extremely important (Rose et al., 2012). This finding is consistent with that of the current study, in which 76% of participants considered the use of pain assessment tools to be at least moderately important for nonverbal patients. While clinical practice reflects the reported importance of the use of pain assessment tools in this study, as the study by Rose et al. (2012) demonstrates, perceived importance of behavioral pain assessment (74% reporting it to be moderately or extremely important) does not always translate into clinical practice (33% reporting use of a pain assessment tool for nonverbal patients over 50% of the time). A similar occurrence was seen in a study conducted by Wysong (2014), in which participants reported a high degree of agreement with general pain assessment standards, while the score corresponding to actual pain assessment in nonverbal patients was significantly lower. As Wysong (2014) suggests, this discrepancy between reported beliefs and actual practice may be due to a lack of knowledge in nonverbal pain assessment or may be related to a hesitancy to accept the standards of pain assessment for nonverbal patients (Discussion, par. 2). The agreement between perceived importance and actual use of pain assessment tools in nonverbal patients in this study may be due to the fact that all questions on the modified survey assessed pain evaluation in nonverbal patients. Unlike the studies by Rose et al. (2012) and Wysong (2014), there was no comparison between the perceived importance of general pain assessment standards and practice that was specific to nonverbal patients.

Specific pain assessment tools. The most commonly used pain assessment tools in this study were the NVPS (72%) and the BPS (20%). Studies have shown the NVPS to be both valid and reliable (Al Darwish et al., 2016; Chanques et al., 2014). Some research

indicates that various parameters of its subscales have weak reliability and limited sensitivity (Al Darwish et al., 2016). In a study comparing the NVPS to the CPOT and the BPS, the interrater reliability, internal consistency, and responsiveness of the NVPS were found to be less than those of the other two tools (Chanques et al., 2014). The BPS is another commonly used tool for pain assessment in nonverbal patients, with various studies supporting its interrater reliability, internal consistency, and validity (Al Darwish et al., 2016; Stites, 2013; Varndell, Fry, & Elliott, 2016). Studies have evaluated other aspects of the BPS, providing overall support for its sensitivity, discriminant validity, and ease of use (Al Darwish et al., 2016; Chanques et al., 2014; Rijkenberg et al., 2015; Stites, 2013). While both the NVPS and the BPS have been evaluated in various studies and have been shown to be valid and reliable tools for assessing pain in nonverbal patients, the NVPS tends to be less preferred for clinical use (Chanques et al., 2014; Lovin, 2016a).

While none of the nurses in the current study reported use of the CPOT, research tends to support it as the best tool overall for pain assessment in patients unable to communicate their pain. Studies have established the appropriateness of this tool for use in both specific and general critically ill populations (Buttes et al., 2014). Pasero and McCaffery (2011) prefer the CPOT over the BPS due to the fact that it contains more categories of evaluation and because it distinguishes patients who are intubated from those who are not in its assessment of pain. While this increase in categories may provide a more accurate pain assessment, it may also make this tool more complicated to use in the clinical setting. Numerous studies have established the discriminant validity, internal consistency, and interrater reliability of the CPOT (Al Darwish et al., 2016; Buttes et al.,

2014; Chanques et al., 2014; Kanji et al., 2016; Keane, 2013; Liu et al., 2015; Rijkenberg et al., 2015; Stites, 2013; Varndell et al., 2016). Since the CPOT is the tool most commonly supported by the literature, further investigation should be performed to discover whether lack of knowledge of the tool or some other reason is responsible for its disuse in this clinical setting (Lovin, 2016a).

Behavioral indicators of pain. Behaviors reported as routinely indicative of pain by at least 50% of the participants included vocalization, splinting, grimacing, wincing, clenching, and guarding (see Table 3). All of the participants considered physiologic indicators to be at least moderately important in the assessment of pain in nonverbal patients, with 76% believing them to be extremely important. Most behavioral pain scales obtain a score by consideration of many of these same items. The BPS assesses facial expression, upper limb movement, and ventilator compliance (Varndell et al., 2016). The CPOT evaluates facial expression, body movement, muscle tension, verbal response, and ventilator compliance (Varndell et al., 2016). The NVPS takes into account facial expression, body movement, and muscle tension (Varndell et al., 2016). As Table 3 indicates, nurses are aware of certain behaviors that are indicative of pain even without a formal pain assessment tool. The difference, however, is that pain assessment tools provide numeric scores corresponding to the degree to which these behavioral cues are manifested. While individual nurses may recognize the same behavioral indicators of pain, the numeric value assigned to them without the use of a pain assessment tool may be very subjective, leading to inconsistent reports of pain between different nurses. The use of pain assessment tools may contribute to more standardized pain assessments and thus greater continuity of treatment, as well as improved communication between

healthcare providers (Bourbonnais, Malone-Tucker, & Dalton-Kischel, 2016). The use of pain assessment tools may also assist in the early detection of pain and the selection of specific interventions and may hold nurses accountable for documenting pain (Wøien & Bjørk, 2013).

Pain assessment tools and clinical judgment. Nurses may be reluctant to use pain assessment tools when the tool takes into account behaviors that the nurse does not consider to be indicative of pain (Rose et al., 2012). The reverse is also true, when nurses consider items not included in pain assessment tools to be important indicators of pain. This point is illustrated by the fact that 12 participants (48%), when provided the option to write in other physiologic indictors of pain, reported the belief that changes in vital signs, most commonly an increase in respiratory rate and heart rate, were indicative of pain. A similar belief was demonstrated in the 2014 study by Wysong, in which 72% of participants indicated a belief that changes in vital signs are indicative of pain. Research has shown that the value of vital signs as indicators of pain is limited (Barr et al., 2013; Herr, Coyne, McCaffery, Manworren, & Merkel, 2011; Gélinas, 2016). Such a conclusion is due to the fact that changes in vital signs may be caused by many factors other than pain and do not follow a consistent pattern of change in response to pain (Gélinas, 2016; Herr et al., 2011). Belief in the importance of indicators such as vital signs, which are not included in many pain assessment tools, may impact the degree to which nurses are willing to assign a pain score based on a pain assessment tool instead of their personal nursing judgment.

Research has shown that a tension is often perceived between standardized tools and the clinical judgment of experienced nurses. A study by Wøien & Bjørk (2013)

revealed that standardized tools are often seen as unable to account for the nuances of the assessment made by an experienced nurse and dismissive of the experience and judgment of the nurse. Another study, conducted by Gerber, Thevoz, and Ramelet (2015), examined the attitudes and practice of expert nurses and showed that even when pain assessment tools are utilized in nonverbal patients, expert nurses may ultimately rely on their assessment of physiologic indicators.

Even when pain is assessed, other considerations must be taken into account for pain management. Gerber et al. (2015) showed that nurses' decision to give pain treatment was influenced by their assessment of the stability of the patient as indicated by heart rate, blood pressure, intra-cranial pressure, etc., in addition to the pain score. These indicators helped the nurses evaluate whether the changes noted in the pain assessment were actually due to pain or were related to some other cause (Gerber et al., 2015). Thus, implementation of a standardized pain assessment tool into unit protocol may supplement but not replace clinical judgment (Wøien & Bjørk, 2013).

Barriers to the Use of Pain Assessment Tools in Non-communicative Patients

While the majority of study participants reported use of a pain assessment tool, it is important to evaluate barriers to the use of these tools to promote further compliance with their use. Nursing workload was the only factor considered to be a barrier often or routinely to the use of these tools by at least 50% of participants. Patient instability was considered a barrier by 80% of the participants at least sometimes (26 – 50% of the time). These findings were similar to the results obtained by Rose et al. (2011), in which hemodynamic instability, patient inability to communicate, and nursing workload were cited as the three most common barriers to pain assessment and management in general.

The fact that nursing workload was most commonly considered a barrier to the use of pain assessment tools highlights the need for tools that are simple, easy, and quick to utilize in the clinical setting. The BPS tends to have good feasibility and was ranked above the CPOT for ease of use by ICU nurses (Chanques et al., 2014; Varndell et al., 2016). The NVPS was also reported to have high ease of use (Chanques et al., 2014). While the CPOT is often considered superior to the BPS and the NVPS as an assessment tool in nonverbal patients, this lower ease of use in actual clinical practice may limit its implementation.

Years of Experience and Pain Assessment Practices

No correlation was found to exist between years of experience as a nurse and the perceived importance of using a pain assessment tool to evaluate pain in the nonverbal population (Spearman correlation coefficient of 0.216, $p = 0.300$) or between years of experience and the frequency of pain assessment tool use (Spearman correlation coefficient of -0.174, $p = 0.404$). These findings are consistent with those of the study by Wysong (2014), which identified no significant differences in attitudes or practices in the area of pain assessment in nonverbal patients based on age, experience, or level of education. They differ, however, from the results of the study by Rose et al. (2011), in which nurses with more experience tended to use pain assessment tools in non-communicative patients less than did nurses with fewer years of experience. Other studies examining the pain assessment practices of expert nurses tend to show that while these individuals may use pain assessment tools, they also rely heavily on their clinical judgment (Gerber et al., 2015; Wøien & Bjørk, 2013). Further research is necessary to examine differences that exist in pain assessment practices across the range of nursing

experience.

Other Considerations in the Use of Pain Assessment Tools

The study by Rose et al. (2012) assessed the knowledge of participants regarding guidelines and practice recommendations for pain assessment and management. Similar questions were not included in the modified survey implemented in this study. An evaluation of the exposure of participants to such knowledge or to training sessions on pain assessment and management may reveal correlations between pain assessment practices and specific education received by nurses. If such correlations exist, education programs may be tailored to promote increased use of pain assessment tools in the clinical setting.

Rose and associates conducted another study in 2013 to examine the effect that the implementation of the CPOT for pain assessment in non-communicative patients would have on the frequency of documentation of pain and the administration of analgesics and sedatives. Study results showed a dramatic increase in the frequency of documentation of pain assessments. Despite this increase in documentation, no analgesic was administered in approximately 40% of the assessments that were positive for the presence of pain (Rose, Haslam, Dale, Knechtel, & McGillion, 2013). Similarly, another study revealed that no analgesia was administered for 29% of the pain evaluations that were positive for the presence of pain (Bourbonnais et al., 2016). These studies reveal that assessment of pain is not necessarily followed by an increase in its treatment. While this study is limited to an examination of the use of pain assessment tools, further research is necessary to examine the degree to which pain assessments lead to actual treatment of the pain.

Limitations

Various limitations are present in this study. First, the use of surveys does not guarantee that the practices reported are those which actually occur in the clinical setting. Individuals may report practices that conform to known hospital policies instead of those which occur in the clinical setting. Also, nurses may consider observation of certain behavioral indicators as use of a tool, without having actually assigned the numeric values to the behaviors as the tool specifies. Second, one question on the survey assessed specific pain assessment tools used by the participant. While a list was provided of the most commonly used pain assessment tools, the specific name of the one used by the hospital at which the study was conducted was not included on the list. An option was provided for the individual to write in the name of the tool which was used, but it is possible for an individual to use a pain assessment tool regularly and not know its official name. This unfamiliarity with technical names of tools may limit the accuracy of the results obtained from this question. Finally, data collection from the Cardio Thoracic ICU occurred at a leadership meeting. Data from this group may have been biased since these individuals do not necessarily reflect the practices of most staff nurses.

Recommendations for Future Study

More research is needed to determine the practice of nurses across the nation in varied hospital settings regarding the use of pain assessment tools in nonverbal patients. Further investigation should also be performed to discover whether lack of knowledge of the tool or some other reason is responsible for the disuse of the CPOT, the nonverbal pain assessment tool most supported by the literature, in this clinical setting. Additional studies will be necessary to examine differences that exist in pain assessment practices

across the range of nursing experience. Finally, additional research should be performed to evaluate the measures, or lack thereof, taken to treat pain once it has been identified using pain assessment tools.

Conclusion

Most of the nurses surveyed not only use tools for the pain assessment of nonverbal patients, but use them frequently and consider their use to be important. Since nursing workload is the most common barrier to the use of these tools in clinical practice, unit policy should support the use of assessment tools that are not only supported by research, but also easy and quick to use. A lack of correlations between years of experience as a nurse and use of pain assessment tools and perceived importance of such tools respectively leads to the conclusion that the use of these tools is consistent in this setting by both new nurses and those with more experience. Careful pain assessment is crucial for patients who cannot report their own pain, and hospitals should regularly evaluate compliance with nonverbal pain assessment policies and the agreement of those policies with current research. The findings of the current study may be used to tailor future staff education programs on pain assessment in nonverbal patients to existing knowledge and practice.

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