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Pain Screening in the Older Adult With Delirium

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ABSTRACT

Background: In patients with cognitive impairments who are unable to self-report pain, nurses must rely on behavioral observation tools to assess and manage pain. Although frequently employed in medical-surgical units, evidence supporting the psychometric efficacy of the Pain in Advanced Dementia (PAINAD) for pain screening in older adults with delirium is lacking.
Aim: To examine the psychometrics of the PAINAD for older adults with delirium in medical-surgical settings.
Design: A descriptive repeated measures design.
Setting: Medical-surgical units in an urban tertiary care hospital.
Participants: Sixty-eight older adults with delirium.
Methods: Patients with delirium unable to self-report pain were screened by two data collectors with the PAINAD and the Critical Care Pain Observation Tool (CPOT). Patients with a PAINAD score ≥3 or a CPOT score ≥2 received a pain intervention. Pain assessments were repeated 30 minutes post baseline or pain intervention.
Results: Patients were predominately female (58.8%) with dementia (71%). Thirty-nine patients screened positive for pain and received a pain intervention. PAINAD reliability was strong (Cronbach's $\alpha = 0.81$-0.87; interrater intraclass coefficients [ICC] = 0.91-0.94; test-retest ICC = 0.76-0.77). Construct validity was supported by a statistically significant interaction effect between time (baseline versus follow-up) and condition (pain intervention versus no pain group; Rater 1: $F(1,66) = 8.31$, $p = 0.005$, $\eta_p^2 = 0.11$; Rater 2: $F(1,66) = 8.22$, $p = 0.006$, $\eta_p^2 = 0.11$.
Conclusions: The PAINAD is a reliable and valid tool for pain screening for older adults with delirium in medical-surgical settings.
Clinical Implications: Pain and delirium frequently co-occur in the older adult population. Best practices require a holistic assessment for contributing pain and non-pain factors in patients exhibiting distress.

A fundamental goal of nursing is to mitigate pain and suffering (Ferrell & Coyle, 2008). Nurses, by virtue of their pain management priorities, depend on pain assessment tools with strong psychometric properties to ensure precise pain screening across settings. Self-report is acknowledged as the gold standard in pain assessment (Herr, Coyne, McCaffery, Manworren, & Merkel, 2011). Unfortunately, patients with cognitive impairment are frequently unable to accurately communicate their pain experiences (Hadjistavropoulos et al., 2014). Thus, pain in this population may go unassessed and undertreated (Hadjistavropoulos et al., 2014; Paulson, Monroe, & Mion, 2014). Pain in cognitively impaired patients is associated with lower quality of life and function (Park, Engstrom, Tappen, & Ouslander, 2015) and higher rates of depression, anxiety, and agitation (Malara et al., 2016). Furthermore, research suggests that pain in the perioperative period increases the risk of delirium (Denny & Such, 2018; Leung et al., 2009; Robinson & Vollmer, 2010; Vaurio, Sands, Wang, Mullen, & Leung, 2006), and evidence-based guidelines support the mitigation of pain to deter the development of

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delirium (Aldecoa et al., 2017; Inouye et al., 2015). The importance of mitigating pain for older individuals will continue to grow as the population ages and pain (Macfarlane, 2016) and cognitive impairments (Livingston et al., 2017) become more prevalent.

Cognitive impairment can present in several forms (Rizzi, Rosset, & Roriz-Cruz, 2014). Dementia, of which Alzheimer's disease is the most common form, results in significant functional impairments (Livingston et al., 2017), affects one in four acute care patients (Jackson et al., 2017), and commonly coexists with delirium (Jackson et al., 2017; Paulson et al., 2014; Pryor & Clarke, 2017). Delirium, an acute disorder, is considered reversible and includes signs of inattention and disorganized thinking (National Institute for Health and Care Excellence, 2010). The occurrence rate of delirium (prevalence rate [present on admission] plus incidence rate) varies from 29% to 64% in medical-surgical wards (Inouye, Westendorp, & Saczynski, 2014). Delirium can present as hypoactive, hyperactive, or mixed. Dementia should always be considered in patients with delirium because recent research suggests that nearly one third of delirium patients also have undiagnosed dementia or other forms of cognitive impairment (Jackson, MacLullich, Gladman, Lord, & Sheehan, 2016). Delirium superimposed onto other forms of cognitive impairment including dementia presents challenges to nurses in ensuring appropriate pain assessment and management (Paulson et al., 2014; Pryor & Clarke, 2017).

Pain screening for cognitively impaired patients in acute care settings is receiving increased attention (Feast et al., 2018; Paulson et al., 2014; Tsai, Jeong, & Hunter, 2018). A recent review synthesized the literature related to pain assessment and management for hospitalized patients with dementia and identified nursing assessment and management of pain as suboptimal (Tsai et al., 2018). Multiple authors have suggested that standardized approaches to pain assessment with observational tools for cognitively impaired acute care patients may promote optimal pain management (Paulson et al., 2014; Tsai et al., 2018).

Observational pain screening tools have been developed for patients who are unable to self-report pain (Chow et al., 2016; Paulson et al., 2014). These tools assess behavioral indicators of pain such as grimacing and moaning (Paulson et al., 2014). In systematic and integrative reviews, the Pain Assessment in Advanced Dementia (PAINAD) screening tool has been shown to have stronger psychometric properties than other observational pain screening tools (Chow et al., 2016; Hadjistavropoulos et al., 2014) and has been validated in advanced dementia patients (Warden, Hurley, & Volicer, 2003) and in long-term (Chow et al., 2016; Lints-Martindale, Hadjistavropoulos, Lix, & Thorpe, 2012; Warden et al., 2003), surgical (DeWaters et al., 2008), emergency (Fry & Elliott, 2018), and intensive care settings (Paulson-Conger, Leske, Maidl, Hanson, & Dziadulewicz, 2011). Although, the PAINAD may be used commonly in some medical-surgical settings in patients with delirium (Feast et al., 2018), evidence of its psychometric properties in this population and setting is lacking. Thus, the purpose of this study was to examine the psychometric properties of the PAINAD for pain screening in a sample of patients with delirium in a medical-surgical setting.

Methods

Setting and Sample

This study employed a descriptive repeated-measures design. Data were collected between September 2015 and September 2016 on two medical-surgical units (total of 62 beds) in an urban academic medical center in the southwestern United States. In each unit, every patient was assessed for delirium with the Confusion Assessment Method (CAM) (Inouye, 1990) at the beginning of each 12-hour shift. Patients who were CAM positive, ≥65 years of age, and unable to state a pain score on a scale of 0 to 10 were included in the study.

A power analysis estimated the sample size needed to establish the convergent validity of the PAINAD in the sample and setting identified, and to avoid a type II error. Because of the difficulties inherent in conducting power analyses in repeated-measures analyses (Guo, Logan, Glueck, & Muller, 2013), we ran the power analysis in GLIMMPSE (Kreidler et al., 2013) using the parameters observed in a repeated-measures analysis of variance (ANOVA) from an initial sample of 36 patients. Based on the observed effect size and parameters from this sample, a power level of 0.80, and a confidence level of 95%, 36 participants per condition (patients experiencing pain vs those not experiencing pain) would assess the PAINAD's ability to screen for pain across persons with and without pain.

Measurement

Demographic attributes (age, sex) and clinical attributes (e.g., length of stay, history of dementia) from the medical record were recorded on an author-generated data abstraction tool.

PAINAD

The PAINAD is an observational tool originally developed for use in long-term care facilities. The PAINAD screens patients for pain through five behavioral measures: breathing, negative vocalization, facial expression, body language, and consolability. Behaviors are scored from 0 (no pain) to 2 (the highest score for pain) for each behavior and are summed for a total score from 0 to 10 (Warden et al., 2003). A score of ≥3 indicates pain requiring intervention. Prior psychometric testing revealed internal consistency statistics (Cronbach α) ranging from 0.50 to 0.65 and interrater reliability (intraclass correlation coefficients [ICCs]) ranging from 0.82 to 0.97 (Warden et al., 2003). Construct (convergent) validity was examined by comparing the PAINAD with other behavioral pain scales in populations with dementia (Warden et al., 2003) and non−medical-surgical settings (Chow et al., 2016; DeWaters et al., 2008; Lints-Martindale et al., 2012; Paulson-Conger et al., 2011; Warden et al., 2003).

Critical Care Pain Observation Tool

The Critical Care Pain Observation Tool (CPOT) was used in this study to determine construct (convergent) validity of the PAINAD. The CPOT was developed for use in critical care settings with patients who are unable to self-report pain due to conditions such as intubation, sedative use, and fluctuating mental status (Gelinas, Harel, Fillion, Puntillo, & Johnston, 2009). Four behavioral domains of pain are assessed: patient facial expression, body movements, vocalization, and muscle tension. Individual domain items are scored from 0 (no pain) to 2 (highest score for pain); total scores range from 0 to 8. A score ≥2 indicates pain (Gelinas et al., 2009). In a sample of intensive care unit patients with delirium, the CPOT demonstrated strong internal consistency (Cronbach $\alpha = 0.778$), interrater reliability (ICC = 0.977), and discriminant validity (mean difference baseline to painful stimuli: 3.13 ± 1.56; $p < .001$) (Kanji et al., 2016). The CPOT is extensively employed for assessing pain in nonverbal critically ill patients (Li, Puntillo, & Miaskowski, 2008). Research suggests that the CPOT and the PAINAD share similar psychometric pain screening properties in nonverbal critically ill patients (Paulson-Conger et al., 2011). Thus, the CPOT was chosen based on its ease of use, psychometric strength, and current use within the study hospital.

CAM

The CAM is the most widely used screening tool for delirium in clinical practice (Marcantonio, 2017). It has been cited in more than 5,000 original articles and translated into 14 languages (Marcus Institute for Aging Research, 2014). The CAM score is based on the presence of four indictors of delirium: acute onset and fluctuating course (0-1; no/yes), inattention (0-2; none/mild/marked), disorganized thinking (0-2; none/mild/marked), and altered level of consciousness (0-2; normal/mild [vigilant or lethargic]/marked [stupor or coma]). Scores are summed and range from 0 to 7. Delirium is diagnosed when acute onset, fluctuating course, and inattention are present along with either disorganized thinking or altered level of consciousness is present. Prior investigations found the CAM to have strong kappa scores (0.81-1.0), supporting interrater reliability (Inouye, 1990). In a meta-analysis, the pooled sensitivity of the CAM was 82% (95% confidence interval 69%-91%), and pooled specificity was 99% (95% confidence interval 87%-100%) (Han et al., 2013). Convergent validity of the tool was established by comparing the CAM with four other mental status tests (Inouye, 1990).

Procedures

The Institutional Review Boards of the University of California Los Angeles and California State University Long Beach provided expedited approvals for the research. A waiver of informed consent was granted because 1) the research examined current standard nursing practice on the medical-surgical units which included CAM screening for delirium and PAINAD screening for pain twice daily and as appropriate, 2) the project presented minimal risk to the patient population, and 3) the patients (or surrogates) signed consents for treatment (which includes pain screening) at the project medical center. To promote fidelity in the administration of the tools, data collectors (registered nurses identified by author MF) completed educational modules (2 hours total) on the PAINAD and CPOT scales as well as face-to-face trainings. Additionally, a palliative care clinical nurse specialist at the hospital provided another review of the tools and observed data collectors administering the measures (CAM, CPOT, PAINAD) on several occasions.

Four weeks before study initiation, nursing staff received an email from management describing the research. Flyers were posted around project unit common areas that described the study and included information related to inclusion criteria for potential patient participants. On data collection mornings (~2 days per week), individual nurses referred patients for the study based upon the inclusion criteria: ≥65 years old, unable to verbalize pain score, and CAM positive. Before assessment of the patients, demographic and clinical data were abstracted from the patients' electronic health records.

For the assessments, two data collectors entered each patient's room simultaneously and stood on opposite sides of the room. If a family member or visitor was present, permission to complete the assessments was requested. To confirm eligibility, one data collector asked the patient to report a pain score using a 0 to 10 numeric scale. Then, both data collectors did a CAM screening. After eligibility confirmation, data collectors completed the observational pain assessments (PAINAD, CPOT) over 3 to 4 minutes. After the data collectors departed the room, they compared their assessments. On the few occasions where there was a variance between the data collectors' total scores on the CPOT or PAINAD, a palliative care clinical nurse specialist assessed the patient and provided a final score. When the PAINAD score was ≥3 or the CPOT was ≥2, the bedside nurse was asked to provide an appropriate pain intervention such repositioning, heat therapy, or pain medicine. The data collectors were not blinded related to the intervention. Approximately 30 minutes after the pain intervention or the baseline assessment, a reassessment of pain with the PAINAD and the CPOT was completed, per hospital protocol.

Analysis

In this study, measures of central tendency and dispersion (e.g., means, ranges, standard deviations, percentages) describe baseline characteristics of the sample. Appropriate bivariate tests (independent samples t tests, Fisher exact tests, χ^2 tests of independence) compare patients with and without pain on clinical and demographic variables. Cronbach α examined the internal consistency of the PAINAD, and ICCs measured interrater and test–retest reliability. Pearson product correlations between CPOT and PAINAD items and a repeated-measures 2 × 2 ANOVA examined for construct (convergent) validity. The International Business Machine's Statistical Package for Social Sciences (SPSS) version 25 was used for all analyses. Table 1 identifies acceptable levels of statistical significance for each planned analysis.

Results

Of the 75 patients initially identified by nursing staff to the data collectors, 68 met the inclusion criteria and were involved in the final analysis. Reasons for exclusion included age <65 years (n = 1), CAM negative (n = 4), loss of follow-up data due to clinical deterioration/rapid response code (n = 1), and patient transfer (n = 1). Patient mean age was 85.4 years (range 66-101, standard deviation 9.6). Common diagnoses included dementia (n = 44, 71%) and infection (n = 31, 46.3%). Appropriate bivariate tests found no statistically significant differences in baseline characteristics of patients with and without pain for any variable except sex (women were less likely to experience pain at baseline) (Table 2).

Reliability

The Cronbach α coefficient for the PAINAD revealed strong internal consistency at baseline (0.81-0.82 [rater 1, rater 2]) and 30-minute follow-up (0.87 [both raters]). Interrater reliability ICCs were also strong (baseline ICC = 0.91; 30-minute follow-up

Table 1
Description of Reliability and Validity Methods

Psychometric Property	Description	Statistic	Level of Acceptability	
Interrater reliability	The degree of agreement between 2 observers in measuring a phenomenon of interest	Intraclass correlations*	0-0.40 0.41-0.69	Weak Moderate
Test-retest reliability	The degree of stability of an instrument when a phenomenon is measured twice over time		0.70-1.00	Strong
Internal consistency	The degree to which a set of variables in a scale are internally consistent and interrelated	Cronbach α†	0.70 0.80 >0.90	Minimum required Ideal Potential redundancy
Construct validity (convergent)	The degree to which two approaches to measuring a phenomenon provide similar results	Pearson product correlations between PAINAD and the CPOT; repeated-measures 2 × 2 ANOVA	$p \leq .05$	

ANOVA = analysis of variance; CPOT = Critical Care Pain Observation Tool; PAINAD = Pain Assessment in Advanced Dementia screening tool.
* Level of acceptability from Huck 2012.
† Level of acceptability from Valente 2002.

Table 2
Clinical and Demographic Characteristics

	Total Sample (N = 68)	Patients		P*
		Without Pain (n = 29)	With Pain (n = 39)	
	M (Range, SD)			
Age	85.4 (66-101, 9.6)	84.17 (66-101, 11.1)	86.3 (66-96, 8.4)	.37
Length of stay, days	4.6 (1-26, 4.5)	4.1 (1-15, 3.7)	4.9 (1-26, 5.1)	.45
	n (valid %)			
Ethnicity				.10
White	49 (72.1)	17 (58.6)	32 (82.1)	
Black	7 (10.3)	4 (13.8)	3 (7.7)	
Other	12 (17.6)	8 (27.6)	4 (10.2)	
Sex				.05
Male	28 (41.2)	8 (27.6)	20 (51.3)	
Female	40 (58.8)	21 (72.4)	19 (48.7)	
Actively infected	31 (46.3)	15 (51.7)	16 (42.1)	.43
Use of sedating medications (e.g., benzodiazepines)†	10 (14.9)	3 (10.3)	7 (18.4)	.36
History of dementia‡	44 (71.0)	19 (65.5)	25 (75.8)	.38
History of pain (e.g., arthritis, low back pain, neuralgia)§	37 (54.4)	12 (41.4)	25 (64.1)	.06
Required anesthesia‖	11 (16.2)	5 (17.2)	6 (15.4)	.83

M = mean; SD = standard deviation.
Missing data occurred with some variables, so that there may be < 68 respondents for an item.
* Reported for two-tailed, independent samples t tests, Fisher exact tests, and χ^2 of independence.
† N = 67.
‡ For history of pain, N = 62.
§ N = 62.
‖ Received general, local, or regional anesthesia during present hospitalization.

ICC = 0.94). Test-retest reliability in patients without pain was strong from baseline to 30-minute follow-up (ICC = 0.76-0.77 [rater 1, rater 2]) (Table 3). For patients with pain, test-retest reliability scores were not calculated, as these scores were anticipated to improve with interventions.

Validity

PAINAD and CPOT scores improved in patients with pain after they received interventions (Figs. 1 and 2). In patients without pain, PAINAD scores remained stable over time (Figs. 1 and 2). However, the CPOT scores increased modestly from baseline to 30-minute follow-up (Fig. 2). A repeated-measures 2 × 2 ANOVA with PAINAD scores supported construct (convergent) validity by detecting a statistically significant interaction effect between time (baseline vs follow-up) and condition (pain intervention vs no-pain group; rater 1: $F[1, 66] = 8.31$, $p = .005$, $\eta_p^2 = 0.11$; rater 2: $F[1, 66] = 8.22$, $p = .006$, $\eta_p^2 = 0.11$). A repeated-measures 2 × 2 ANOVA examining interaction effects between time and condition with the CPOT revealed similar results (rater 1: $F[1,66] = 13.00$, $p = .001$, $\eta_p^2 = 0.17$; rater 2: $F[1,66] = 9.69$, $p = .003$, $\eta_p^2 = 0.13$). In addition, a strong correlation (0.91) between total PAINAD scores and total CPOT scores supports convergent validity ($p \leq .01$).

Discussion

To our knowledge, this is the first study to examine the psychometrics of the PAINAD in CAM-positive older adults (age ≥65 years) in a medical-surgical setting. Although PAINAD psychometrics have been examined in diverse settings including residential care (Chow et al., 2016; Lints-Martindale et al., 2012; Warden et al., 2003), intensive care (Paulson-Conger et al., 2011), emergency (Fry & Elliott, 2018), and surgical settings (DeWaters et al., 2008); our study suggests that the PAINAD is a reliable and valid tool for screening pain in older adults with delirium residing in medical-surgical settings.

The strong internal consistency and interrater reliability support the PAINAD as a feasible tool for use by bedside nurses in non-intensive care unit and non-long-term care settings. In our study, the data collectors received face-to-face and online training on the measurement tools. Additionally, a clinical nurse specialist periodically audited tool administration during data collection. However, this level of training and evaluation may not be feasible in many clinical settings. Nevertheless, continued education on pain and delirium screening methods is important to ensure consistency in pain screening practices. Additionally, encouraging bedside nurses to participate in quality improvement projects focusing on pain assessment in adults with delirium may facilitate improvements in patient care and uniformity in clinical practice.

An unexpected finding was the modest increase in the CPOT scores from baseline to follow-up in patients without pain (Fig. 2). Most likely, this finding relates to the manner of CPOT administration in this study. The CPOT is designed for use in critically ill patients and involves multiple observations. According to protocol, the patient is observed for 1 minute to establish a baseline score during a nociceptive procedure (e.g., turning, suctioning). Other observations occur before and during the peak effect of an analgesic intervention. The highest score observed during the observation period is the final rating score (Gelinas et al., 2009). The changes in CPOT scores in non-pain patients that occurred during this investigation were modest and may reflect a limitation of our small sample size or the psychometrics of the tool in this setting or sample. Our intention in using the CPOT was for construct (convergent) validity only, and its use was modified for such purposes. The CPOT's ability to serve as the comparison measure for pain assessment may have limitations, although several studies have previously used the CPOT and PAINAD

Table 3
Reliability Statistics of PAINAD (N = 68)

	PAINAD	
	Baseline	30-Minute Follow-up
Cronbach α*	0.81-0.82†	0.87
Interrater reliability‡	0.91	0.94
30-minute test-retest reliability*,§	0.76-0.77†	

PAINAD = Pain Assessment in Advanced Dementia screening tool.
* Missing data, N = 67-68.
† Range represents scores obtained by two raters.
‡ ICC two-way, random.
§ ICC one-way, random, in patients without pain (n = 28).

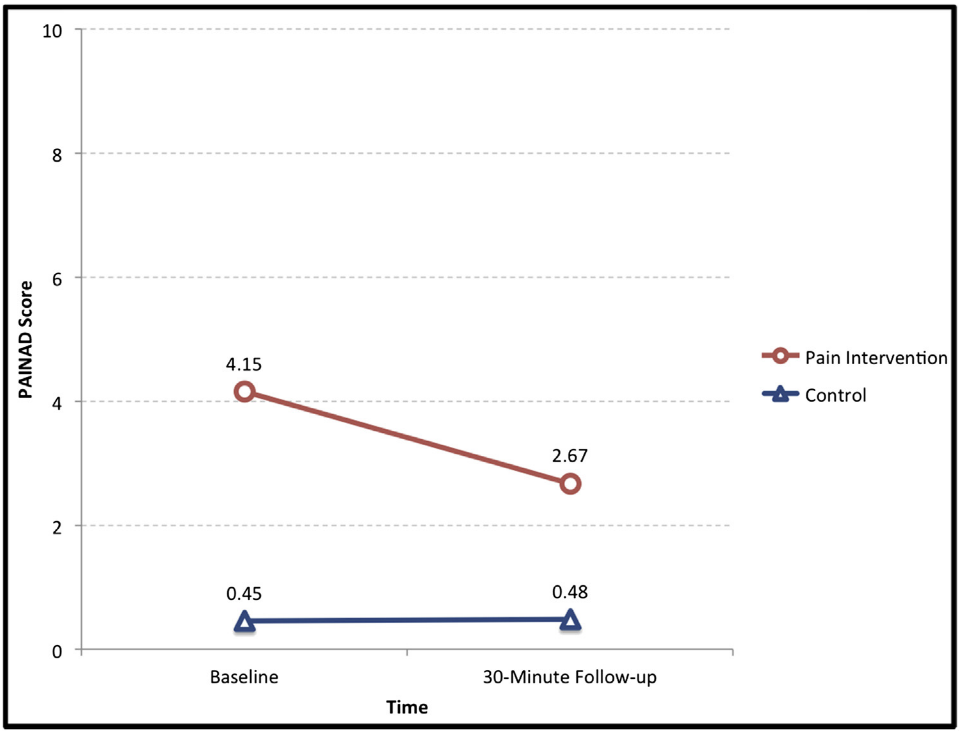

Figure 1. 2 × 2 Repeated ANOVA interaction effect: PAINAD scores × time (N = 68). ANOVA = analysis of variance; PAINAD = Pain Assessment in Advanced Dementia screening tool.

concurrently to establish validity (Marshall et al., 2013; Paulson et al., 2014; Sulla et al., 2017). Future research can build on our work by comparing PAINAD scores with other pain screening instruments in the medical-surgical setting.

As expected, in patients who initially screened positive for pain, PAINAD scores decreased after the patients received appropriate pain interventions (Figs. 1 and 2), supporting the tool's sensitivity to changes in clinical condition. In addition, for patients without pain, there was little noticeable change in the PAINAD after 30 minutes. Although the sample size was less than anticipated due to an abbreviated data collection period that resulted from shifting research priorities at the project medical center, four analyses

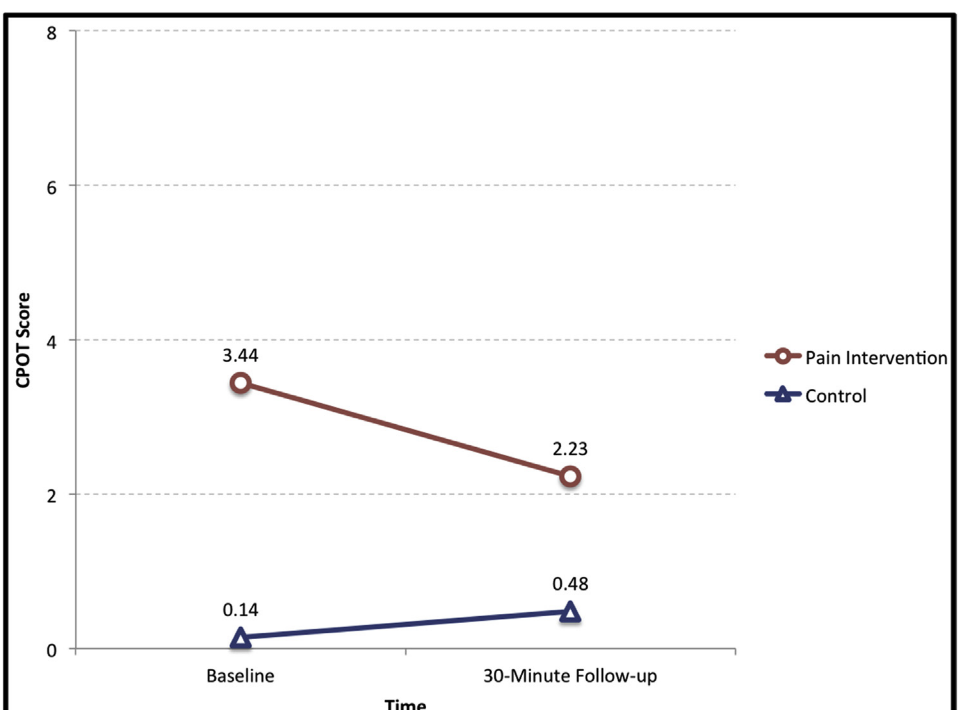

Figure 2. 2 × 2 Repeated ANOVA interaction effect: CPOT scores × time (N = 68). ANOVA = analysis of variance; CPOT = Critical Care Pain Observation Tool.

(PAINAD with raters 1 and 2 and CPOT with raters 1 and 2) examined these relationships, all of which reached statistical significance. Additionally, analyses examining the level and direction of the correlations between individual PAINAD and CPOT items suggest that the scales measure similar but not identical constructs (data not shown).

Previous research established the psychometrics of the PAINAD in patients with advanced dementia (Warden et al., 2003). However, nearly one third of the patients in our study had no recorded history of dementia or may have had mild or moderate dementia (the electronic health record did not specify the level of dementia). The study was not powered to employ subgroup analyses related to dementia; this prevented the researchers from examining the influence of various levels of dementia on the psychometrics of the PAINAD. However, the rates of undiagnosed dementia in patients with delirium are most likely higher than what we report in our study (Jackson et al., 2017). Nevertheless, our sample may more closely reflect a sample of medical-surgical patients commonly seen in hospitals, improving the generalizability of our study's findings. Clearly, future research should investigate how levels of dementia influence the psychometric properties of the PAINAD in older adults with delirium across settings.

During our study, data collectors found the implementation of the CAM to be inconsistent among bedside providers. Differences in scoring between the data collectors and the bedside staff occasionally occurred. This supports previous research that suggests delirium screening may be suboptimal (de la Cruz et al., 2015; Marcantonio, 2017). Additionally, it is important to note that one systematic review suggested that the CAM may have low specificity in patients with baseline dementia (Wei, Fearing, Sternberg, & Inouye, 2008). Thus, it is important for bedside nurses to employ a comprehensive assessment to avoid erroneous delirium diagnoses in patients with dementia (Hartjes, Meece, & Horgas, 2016). Accurate CAM identification is immensely important not only for appropriate pain screening but also for reducing delirium sequelae such as increased length of stay and mortality (Schubert et al., 2018; Weinrebe, Johannsdottir, Karaman, & Fusgen, 2016). Nursing leaders should consider identifying methods to improve the use of the CAM to improve pain screening as well as enhance elder care.

An examination of pain interventions in our study revealed that three patients with clinically actionable pain did not receive a pain intervention, and seven patients who screened negative for pain received an intervention that could provide pain relief (e.g., repositioning, an analgesic). The lack of initiating or intensifying treatments to appropriately address pain is well documented (Shahar, Mendelson, Gerbi, & Ben Natan, 2018; Shugarman et al., 2010; Zubkoff et al., 2010). Researchers did not collect data on the reasons for lack of action or the reasons for providing a pain intervention for patients with a PAINAD score ≤ 2 or a CPOT score <2. Patients without pain may have been repositioned according to a prearranged plan or provided an analgesic (e.g., acetaminophen) for purposes other than pain relief (e.g., to reduce a fever). Regardless of these variations in clinical practice, this study presents empiric evidence that the PAINAD performs as anticipated for pain screening in older adults with delirium.

Limitations

Although our findings support the use of the PAINAD in CAM-positive older adults in medical-surgical settings, we express caution in applying the results to a larger, more ethnically diverse sample. The setting of this study was a single large tertiary urban medical center, and the sample was small and homogenous (primarily Caucasian with baseline dementia). Researcher blinding to pain interventions did not occur, thus presenting a potential threat (detection bias) to the internal validity of this study. Future studies should consider engaging more raters to mitigate this potential for bias. Nonetheless, bedside nurses retained primary responsibility for the assessment, management, and reassessment of pain for all patients.

In this research, most pain assessments occurred between 7:00 a.m. and 11:00 a.m. However, cognition, pain, and delirium in older adult populations tend to fluctuate over the course of the day (Khachiyants, Trinkle, Son, & Kim, 2011; Rice et al., 2011). Limited research has suggested that scores on behavioral tools including the CPOT may change with the level of delirium (Rijkenberg & van der Voort, 2016). A larger sample size would have provided an opportunity to investigate the influence of unmeasured covariates (e.g., time of day, type of delirium, level of dementia) on the psychometrics of the PAINAD. Some patients received sedating medications during hospitalization, and it is important to note that that a sedative medication could potentially influence the baseline and post-pain scores depending upon the time the medication's effect was peaking. Regardless of these cofounding variables, the direction of the pain scores supports the efficacy of the PAINAD with the sample included for this study.

Implications for Nursing

Although the use of behavioral tools for pain screening in cognitively impaired patients is important, these tools have inherent limitations. There are multiple reasons patients display behaviors associated with distress (Wernham, Jordan, & Hughes, 2018). Pain, agitation, and delirium (while separate entities) frequently co-occur in older adults and may be best understood and managed as a syndrome (Hartjes et al., 2016). Nursing practice requires a holistic and thorough assessment for contributing pain and non-pain factors in cognitively impaired older adults exhibiting distress (Hartjes et al., 2016). In addition, the consistent use of behavioral tools could assist nurses in identifying changes in patient condition over time. Undoubtedly, there is no substitution for sound clinical judgment in deciphering whether a high pain score is due to pain or other factors (Hartjes et al., 2016; Wernham et al., 2018). Furthermore, nurses are encouraged to involve individuals who know patients well and can provide essential information to improve accurate patient assessments (Herr et al., 2011).

Conclusions

Understanding the pain experiences of delirium-positive patients remains difficult, as fluctuating mental states challenge appropriate screening practices (Hartjes et al., 2016; Paulson et al., 2014). Therefore, nurses should consider frequent screening for pain with an observational tool in these patients (Paulson et al., 2014). Our study provides empiric evidence to guide pain-screening practice for the vulnerable group of older adults with delirium in medical-surgical settings.

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