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Determination of Pain Behaviours on Endotracheal Tube and Oral Care Practice in Intubated Intensive Care Patients

Alkay Kara[1](ID), Nurgül Bölükbaş[2](ID)

[1]Departman of Medical Services and Techniques, Giresun University, Giresun, Turkey
[2]Departman of Surgical Nursing, Faculty of Health Sciences, Ordu University, Ordu, Turkey

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Abstract

Objective: This study was performed to determine the pain behaviors of the adult intubated patients in the intensive care unit before and during the endotracheal tube care and oral care.

Methods: This cross-sectional descriptive study was conducted in level 3 Intensive Care Units of a Training and Research Hospital in Black Sea. The study sample consisted of 62 adult patients who complied with the criteria of inclusion for the study. The data was collected by the researcher using the "Patient Information Form", "Critical-Care Pain Observation Tool", "Ramsay Sedation Scale"and " Glasgow Coma Scale". Data analysis was performed on computer with a statistical program. Evaluation of data used number, percentage, arithmetic mean, and standard deviation.

Results: The mean score of the Critical Care Pain Observation Scale was 0.21±0.52 before the endotracheal tube and oral care, and the mean score was 3.39 ± 0.98 during the endotracheal tube and oral care, and this difference was statistically significant (p= .000). All subscale point averages of Intensive Care Pain Observation Scale were found to be higher during endotracheal tube and oral care (p= .000).

Conclusion: It was found that the level of pain during oral care and endotracheal tube care for intubated patients in intensive care is higher than immediately before.

Keywords: Intubation, Mouth Care, Pain, Critical Care, Nursing Care

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Address for correspondence/reprints:
Name and Surname: Alkay Kara
Telephone number: +90 (539) 441 64 97
E-mail: alkay@outlook.com.tr

INTRODUCTION

Pain is one of the most important stressors for intensive care patients (1, 2). Gélinas et al. (3) and Yaman Aktaş (4) stated that intensive care patients experience pain from mild levels to severe or uncomfortable levels. Causes of pain for these patients are factors like invasive diagnostic and monitorization methods, mechanical ventilation, tracheal aspiration, daily dressings, and position changes (1,5). Additionally, patients state they feel pain due to interventions like deep respiration and coughing exercises, endotracheal aspiration, wound care, position changes, dressing changes and catheter removal (6). Puntillo et al. (7) stated that patients' experience of pain was commonly due to positioning, removing drains, tracheal aspiration, removal of femoral catheters, insertion of central venous catheters, and changing wound dressings. Esen et al. (8) in studies researching the pain behavior of sedated and intubated intensive care patients, determined patients experienced pain during positioning and aspiration, but mostly during aspiration procedures.

For intensive care patients receiving mechanical ventilation support, in addition to many care interventions, prevention of pressure ulcers that may develop inside the mouth and around the lips and endotracheal tube care with the aim of protecting the patient against infections are very important (9). Oral care and assessment are very important to prevent complications that may develop due to insufficient oral care of intubated patients (9, 10). Oral care is performed in daily routine care administration by nurses in intensive care units. Al Sutari et al. (11) emphasized that intensive care patients experienced high levels of pain during noninvasive interventions like oral care and eye care.

Eti Aslan and Badır (12) stated that more than 60% of patients treated in intensive care units experienced severe pain, while Payen et al. (2) stated more than 70% of patients treated in these units experienced moderate and severe pain. Akıncı et al. (13) in a study of intubated intensive care patients stated that though patients were administered a sedation protocol dominated by analgesia, patients experienced stress countless times, sedation partly reduced the physical symptoms of stress and that 68% of patients felt pain in intensive care. Stanik et al. (14) stated that 96% of patients in the intensive care unit due to trauma experienced pain due to the injured region, while 36% experienced pain due to central venous catheters, arterial catheters, chest tubes, nasogastric tubes, Foley catheters, orthopedic fixation devices and wound drains. Young et al. (15) identified patients who experienced pain during positioning and eye care.

Currently, it is important to manage pain well as it has a significant effect on the quality of life of individuals. The quality of pain management is linked to the knowledge,

behavior, attitude and clinical decision-making status of the health team providing pain treatment. Within this team, nurses have an important role in pain management (16, 17). However, research by Eti Aslan et al. with the aim of determining approaches for intensive care nurses evaluating patient pain levels revealed that most nurses participating in the study did not know how to assess pain in patients with communication problems (18).

Providing quality care for critical patients and elevating patient comfort in intensive care units is an integral part of professional nursing care (19). Planning that includes the determination of pain levels during endotracheal tube care and oral care applied frequently in intensive care units and interventions to reduce pain is important to increase patient comfort (20). In this context, this study was conducted to determine the pain behaviors of adult intubated patients in the intensive care unit before and during endotracheal tube care and oral care.

METHODS

Study Design

This was a descriptive and cross-sectional study.

Study Population and sample

As this study was a cross-sectional study, 62 patients who met the inclusion criteria were included in the study between 18 July and 31 February 2018. The research included those aged 18 and over, unable to express their pain because they were intubated, scored 8-12 on the Glasgow coma scale, scored 2-3 on the Ramsay sedation scale, and were accepted by their relatives to participate in the study. The exclusion criteria for the sample were patients who were not intubated or extubated, received medical treatment for chronic pain, received sedating drugs, had unstable hemodynamic conditions, and had neurological defects that could preclude pain behaviors.

Data Collections

The aims and procedures of the study were explained to the patient relatives and health personnel. The Patient Information Form comprising 13 questions was completed from the patient files for patients abiding by the research criteria. Immediately before the endotracheal tube and oral care of patients, data were collected in line with the CPOT. Patients included in the study had an endotracheal tube and oral care was performed by the researcher. With the aim of determining pain behavior during endotracheal tube and oral care, data was collected with observations in line with the CPOT.

Process Stepsdure

1. Materials were prepared [personal protective equipment (single-use gloves, apron, mask, and goggles), moisturizing cream, ointment, kidney dish, mask, fixation connectors, sponge, plaster, injector 10 cc, scalpel/scissors, stethoscope, ambu bag, oxygen connection cannula].

2. Hands were washed, and necessary personal protective equipment was worn.

3. The procedure was explained to the patient.

4. An appropriate area was chosen for equipment. Curtains were pulled around the bed. The patient was given the appropriate position (semi-Fowler/Fowler).

5. Cuff inflation was checked. If the tube direction was to be changed, air in the cuff was emptied. Endotracheal tube connections were untied while holding the tube fixed and removed slowly and carefully. Lip edges where the endotracheal tube was fixed were observed for ulceration. For patients administered oral intubation, if no specific note was made about intubation tube location, care was taken that it was 22-23 cm at lip level for male patients and 20-21 cm for female patients. For mouth care, gums and oral mucosa were evaluated and mouth care was performed with an oral cleaning rod. Moisturizing cream was spread to prevent dry lips. Without moving the endotracheal tube, it slid toward the other lip edge. A new tube connection was attached by passing a finger between the patient's neck for endotracheal tube fixation. After finishing the procedure, materials were removed, and hands were washed again.

6. With the aim of determining pain behavior during endotracheal tube and oral care, data was collected by the researcher in line with the CPOT.

Data collection tools

Data for the study were collected by the principal researcher with a Patient Information Form, Critical Care Pain Observation Tool, Glasgow Coma Scale, and Ramsay Sedation Scale. First of all, the Glasgow coma scale and Ramsay sedation scale were evaluated in patients who met the inclusion criteria, and it was determined whether the patient's Glasgow coma scale total scores were between 8-12 points and Ramsay sedation scale scores. It was in the 2-3 point range. The pain behavior of the patients was evaluated twice with CPOT, before and during endotracheal tube and oral care.

Patient Information Form

The researcher prepared a patient information form containing socio-demographic characteristics and features related to the diseases of patients based on the literature (20-22). This form included information about the diagnosis, age, sex, educational level, occupation, marital status, number of children, place of referral to the intensive care unit, habits, duration of stay in the intensive care unit, physical limitation status, medication use related to sedation treatment and information related to pain treatment for the patients.

Critical-Care Pain Observation Tool

This was developed by Gelinas et al. (23) in 2006 to evaluate the pain of patients in intensive care units who cannot speak or verbally express

pain. The Turkish validity and reliability of the scale was performed by Yaman Aktaş and Karabulut, in 2013 (4). The pain tool includes 4 elements of facial expression, body movements, muscle tension, and compliance with mechanical ventilator (for intubated patients) or speaking (for extubated patients). The tool has a 3-point Likert type (0-2) with the lowest and highest points of 0 and 8. Low points on the scale indicate less pain is experienced by the patient. The Cronbach's alpha internal consistency coefficient was 0.72 during painful interventions. In this study, the Cronbach alpha internal consistency coefficient for the CPOT was 0.562.

Glasgow Coma Scale

This was developed in Glasgow, Scotland in 1974 to define the consciousness levels of patients. The scale is commonly used to evaluate the consciousness levels of patients in comas. The scale comprises 3 separate sections of eye-opening, verbal, and motor responses. The Glasgow Coma Score (GCS) is obtained by collecting the points obtained in each section. Points vary from three (3) to fifteen (15). If the Glasgow Coma Scale total points are 15, the patient is fully conscious, points below 8 indicate coma, and patients with 3 points do not respond to painful stimuli, do not open their eyes, and flaccidity of muscles is evaluated.

As a result, patients with Glasgow Coma Scale total points from 8-12 were included in this study (24).

Ramsay Sedation Scale

This was developed by Ramsay in 1974 with the aim of assessing the sedation levels of patients. The Ramsay Sedation Scale (RSS) is a scale frequently used to determine the sedation levels of patients in studies in Turkey. Studies determining pain levels of patients in intensive care units have evaluated sedation levels with the RSS (8, 25, 26).

As a result, the RSS was chosen to determine the sedation levels of patients, with patients with awareness levels of 2 and 3 points according to the RSS included in this study as conscious sedation levels end at the 4th stage. The scale comprises a total of 6 items, with three items determining the level of awareness and three items determining sleep levels.

The sedation level is evaluated with points from 1 to 6 on the scale. Increased points indicate an increased level of sedation (8, 27, 28).

Statistical Analysis

Data analysis was performed on a computer with a statistical program. Evaluation of data used numbers, percentages, arithmetic mean, and standard deviation. Data with normal distribution were analyzed using the t-test, variance analysis, and Pearson correlation analysis. Data without normal distribution were analyzed with the Wilcoxon or Mann Whitney U test, Kruskal Wallis test, and Spearman correlation analysis.

RESULTS

The study was completed with 62 patients abiding by the criteria. The mean age of patients was 76.90±12.25 years and 45.2% of these patients were aged 70-84 years. Of patients, 54.8% were female, and 53.2% were married, with a mean of 4.56 children. Of the patients, 51.6% were illiterate, 54.8% were housewives and 93.5% had no smoking or alcohol use (Table 1). Of the patients, 45.2% came from another intensive care unit while 35.5% came from the emergency services. For medical diagnosis, 25.8% of patients had cerebrovascular disease, 12.9% had pneumonia, and 9.7% had respiratory failure. The mean duration of stay in intensive care for patients was 10.23±18.78 days and mean the number of days intubated was 6.37±7.81. The patients had a median Glasgow coma scale value of 8 and a median Ramsay Sedation Scale value of 2. According to the Ramsay sedation scale, 77.4% of patients were cooperative. For 79% of patients, there was no physical fixation present (Table 2).

The mean total points for CPOT before endotracheal tube and oral care was 0.21±0.52, while this was identified as 3.39±0.98 during endotracheal tube and oral care and the difference was statistically significant (p=0.000). The differences in the means for all subdimension points on the CPOT before and during endotracheal tube and oral care were found to be statistically significant (p=0.000). It was determined that the means for total points and points for all subscales of the CPOT were higher during endotracheal tube and oral care (Table 3).

Table 1. Demographic Characteristics of the Sample (n=62)

Variable	n	%
Age ($\bar{X}$±SD)	62±12.25	
Age Groups		
40-54	3	4.8
55-69	11	17.7
70-84	28	45.2
85-99	20	32.3
Gender		
Male	28	45.2
Female	34	54.8
Education		
Not Literate	32	51.6
Literate	12	19.4
Primary School	16	25.8
University	2	3.2
Job		
Farmer	7	11.3
Self-employment	3	4.9
Teacher	1	1.6
Retired	15	24.2
Housewife	34	54.8
Finance official	1	1.6
Not working	1	1.6
Marital status		
Married	33	53.2
Single	29	46.8
Habits		
Cigarette	3	4.9
Alcohol	1	1.6
No	58	93.5

According to the demographic characteristics of patients, comparing the mean total and subdimension CPOT points before endotracheal tube and oral care, only age was found to be statistically significant for mean total CPOT points (p=0.040). Advanced analyses to determine which group was the source of difference (U) determined the mean pain points for the 40–54 year age group

(0.00±0.00) were lower than the mean pain points for the 85-99 year age group (0.50±0.76).

Table 2. Distribution of Patients Related to Intensive Care Process

Intensive care feature	n	%
Where patients come to ICU		
Home	2	3.2
Intensive care	28	45.2
Emergency department	22	35.5
Services	8	12.9
Operating theater	1	1.6
Palliative care center	1	1.6
Patient diagnosis		
Cerebrovasculer disease	16	25.8
Pneumonia	8	12.9
Shortness of breath	6	9.7
Post Cardiopulmonary Resuscitation	5	8.1
Myocardial infarction	4	6.4
Intracrania hemorrhage	4	6.4
Chronic obstructive pulmonary disease	3	4.9
Chronic heart failure	3	4.9
Sepsis	3	4.9
Lung cancer	2	3.2
Oral nutrition disorder	1	1.6
Coronary artery bypass graft	1	1.6
Acute renal failure	1	1.6
Necrotizing fasciitis	1	1.6
Acute cholecystitis	1	1.6
Hypertension	1	1.6
Pancreatitis	1	1.6
Gastric perforation operation	1	1.6
Ramsay Sedation Scale Categories		
Co-operative, oriented, and tranquil	48	77.4
Responding to commands only	14	22.6
Physical Restraint		
Yes	13	21.0
No	49	79.0
Length of stay in Intensive care units (days), mean (SD)	10.23 (18.78)	
Duration of mechanic ventilation (days), mean (SD)	6.37 (7.81)	
GCS, median	8	
RSS, median	2	

Comparison of mean total and subdimension CPOT points during endotracheal tube and oral care based on features related to the intensive care process found the difference between the referral location to the intensive care unit and the "muscle tension" subdimension mean points on the CPOT during endotracheal tube and oral care was statistically significant (p=0.014). Advanced analysis to determine which group caused the difference (U) found that patients referred to the intensive care unit from home had lower "muscle tension" CPOT points (0.50±0.71) compared to patients referred from other locations.

The difference between physical fixation status and CPOT "body movement" subdimension mean points were found to be statistically significant during endotracheal tube and oral care of patients (p=0.047). Advanced analysis to identify which group caused the difference (U) identified that the mean points for the "body movement" CPOT subdimension were higher in patients with physical fixation (1.15±0.38). There was a statistically significant, positive, and low-level correlation between the duration of stay in the intensive care unit and the mean total CPOT points and "facial expression" subdimension points before endotracheal tube and oral care (r=0.30, p=0.02). As the duration of stay of patients in the intensive care unit increased, the CPOT total points and "facial expression" subdimension points increased. There was a statistically significant, positive, and low-level correlation found between the intubation days of patients with the mean total CPOT points and "facial expression" subdimension points before endotracheal tube and oral care (r=0.31, p=0.01). As the number of days of intubation increased, the CPOT total points and "facial

expression" subdimension points increased. There were statistically significantly positive, and low-level correlations found between the Ramsay sedation scale points before endotracheal tube and oral care with the CPOT total points (r=0.295, p=0.020) and "facial expression" (r=0.228, p=0.023) subdimension points. As the Ramsay sedation score of patients increased, the CPOT total points and "facial expression" subdimension points increased. There was no statistically significant correlation identified between Glasgow coma scale points before endotracheal tube and oral care and CPOT total points (p>0.05) (Table 4).

There were statistically significant, positive, and low-level correlations between the duration of stay in the intensive care unit (r=0.26, p=0.05) and Glasgow coma scale points (r=0.278, p=0.029) with the CPOT total points during endotracheal tube and oral care. As the duration of stay in intensive care and Glasgow coma scale points increased, the CPOT total points increased. During endotracheal tube and oral care of patients, there were statistically significantly positive, and low-level correlations identified between CPOT "facial expression" (r=0.361, p=0.004) and "body movements" (r=0.358, p=0.004) subdimensions. During endotracheal tube and oral care of patients, as Glasgow coma scale points increased, the "facial expression" and "body movements" subdimension points on the CPOT also increased. There was a statistically significantly negative, and low-level correlation identified between Ramsay sedation score points with CPOT "muscle tension" subdimension points during endotracheal tube and oral care of patients (r=-0.277, p=0.029). As the Ramsay sedation score points increased during endotracheal tube and oral care, the "muscle tension" subdimension points on the CPOT decreased (Table 4)

Table 3. Comparison of CPOT Scores and Subscale Mean Scores Before and During Endotracheal Tube and Oral Care

CPOT Subdimensions	n	Min	Max	X̄±SD	Test*	p
Facial expressions						
Before practice	62	0	1	0.16±0.37	Z=-7.145	**.000**
During practice	62	1	2	1.21±0.41		
Body movements						
Before practice	62	0	0	0.00±0.00	Z=-7.508	**.000**
During practice	62	0	2	1.00±0.31		
Muscle tension						
Before practice	62	0	1	0.05±0.21	Z=-7.483	**.000**
During practice	62	0	2	0.95±0.34		
Compliance with the ventilator						
Before practice	62	0	0	0.00±0.00	Z=-3.742	**.000**
During practice	62	0	1	0.23±0.42		
CPOT Total Scores						
Before practice	62	0.00	2.00	0.21±0.52	Z=-6.987	**.000**
During practice	62	2.00	7.00	3.39±0.98		

* Z=Willcoxon Test

Table 4. The Correlation Between Mean Points for CPOT and Subdimensions Before and During Endotracheal Tube and Oral Care with Intensive Care Features of Patients

	Facial expressions	Body movements	Muscle tension	Compliance with the ventilator	CPOT Total Scores
ICU Length of stay, days					
Before practice					
r	.30	-	.16	-	.30
p	**.02**	-	.22	-	**.02**
During practice					
r	.19	.06	.19	.24	.26
p	.13	.64	.14	.06	**.05**
Duration of MV, days					
Before practice					
r	.31	-	.16	-	.31
p	**.01**	-	.21	-	**.01**
During practice					
r	.20	.09	.14	.10	.20
p	.11	.50	.29	.42	.12
GCS					
Before practice					
r	-.210	-	-.028	-	-.202
p	.102	-	.829	-	.116
During practice					
r	.361	.358	.028	.047	.278
p	**.004**	**.004**	.829	.718	**.029**
RSS					
Before practice					
r	.288	-	.238	-	.295
p	**.023**	-	.063	-	**.020**
During practice					
r	.006	-.124	-.277	-.107	-.197
p	.962	.337	**.029**	.407	.125

ICU: Intensive Care Unit, MV: Mechanical Ventilation, GCS: Glasgow Coma Scale, RSS: Ramsay Sedation Scale

DISCUSSION

In intensive care units, catheters used for a variety of aims, drains, noninvasive and invasive ventilation methods, treatment and care interventions, aspiration, dressing changes, position changes and rehabilitation applications can be listed among factors causing pain in patients (29-31) Though patients monitored in intensive care units encounter many painful stimuli, studies dealing with this problem in the ICU and attempting to solve it are very limited (29).

More than 60% of patients treated in intensive care units experience “moderate” or “severe” pain (2, 8). As a result, it is important that pain during the day and during invasive and noninvasive applications be evaluated and noted by nurses. This study was completed with the aim of determining pain behavior before and after endotracheal tube care and oral care among intubated adult patients in the intensive care unit.

During endotracheal tube and oral care, the mean CPOT pain points were higher and the difference was statistically significant

(p=0.000). Studies by Güneş (22) and Esen et al. (8) found there was no significant difference in mean pain points before positioning and aspiration; however, there was advanced degree of significance between mean pain points during positioning and aspiration. Studies by Al Sutari et al. (11) showed intensive care patients experienced high levels of pain during positioning, aspiration, invasive procedures, oral care, eye care, and nasogastric tube insertion. Similar to other studies, in this study, the pain levels of patients during noninvasive procedures like tube care and oral care were found to be significantly high for intensive care patients.

The means for all subdimension points on the CPOT during endotracheal tube and oral care were identified to be higher and statistically significant (p=0.000). In a study with a subject control group Yaman Aktaş (4) stated that there were significant differences in "body movement", "muscle tension" and "compliance with ventilator" subdimensions of the CPOT during endotracheal aspiration. The study by Güneş (22) observed comfort rates of 70.9% and 69.2% based on the facial expression of patients before positioning and aspiration of intubated and sedated patients in intensive care, while these rates fell to 15.4% and 8.2% during positioning and aspiration. The same study found 98.4% and 97.8% of patients tolerated ventilation before positioning and aspiration, while these values reduced to 91.8% and 56% during positioning and aspiration. Moreover, the same study stated the pain points for upper extremities (no movement) before positioning and aspiration were 74.2% and 74.7%, while these rates were 24.7% and 20.3% during positioning and aspiration (22). The results of our study are similar to the literature.

In our study, there was a statistically significant difference in the CPOT mean points before endotracheal tube and oral care according to the age of patients (p=0.040). This difference was determined to be due to the mean pain points of patients in the 85-99 year age group (0.50±0.76) being higher than the mean pain points in the 40-54 year age group (0.00±0.00). The results of studies completed about pain state that perception of pain increases in the elderly age group (32, 33).

There were statistically significant differences for "body movement" CPOT subdimension mean points according to physical fixation status and between referral location and "muscle tension" subdimension mean points during endotracheal tube and oral care (p=0.047, p=0.014). The mean "body movement" CPOT subdimension points were higher for patients with physical fixation. Physical fixation is applied in intensive care units for a variety of aims and there are results in the literature stating that remaining immobile for long periods causes pain in patients (34, 35). Patients referred to intensive care from home

were identified to have lower mean points for the "muscle tension" CPOT subdimension. This situation may be interpreted as being due to caregivers in the home environment taking more care during interventions like position changes of patients.

In this research, there were positive low-level significant correlations identified between duration of stay in the intensive care unit and CPOT total points and "facial expression" subdimension points before endotracheal tube and oral care (p=0.02). As the duration of stay in the intensive care unit increased, the mean points for the "facial expression" subdimension and CPOT total increased. The pain behavior most often used for intensive care patients who cannot communicate verbally or express pain is "facial expression" (36, 37). Though reactions occurring linked to pain change individually, the reactions formed in the Musculoskeletal system in patients who cannot express, or report pain are universal and are defined as "pain behavior" (36). In the ICU it was stated that the most commonly observed pain behavior is "facial grimacing" (36-38). These results of the study comply with the literature.

The study found positive and low-level significant correlations between the number of days intubated and mean total CPOT points (p=0.01) and "facial expression" (p=0.01) subdimension points before endotracheal tube and oral care. As the number of days intubated increased, the mean for the "facial expression" subdimension and CPOT total points increased. As patients who are intubated linked to mechanical ventilation cannot verbally express themselves during invasive and noninvasive procedures, they attempt to express themselves through behavioral reactions such as facial and forehead grimacing, facial reddening, pulling their knees upward, attempting to make sounds, pulling inward, pushing the person treating them, clenching their fists, biting the intubation tube, moving away from the painful stimuli in the region of intervention, etc (21, 37, 39). In accordance with the literature, in this study as the number of days of intubation of intensive care patients increased, there was an increase determined in behavioral pain reactions.

The study determined positive and low-level significant correlations between Ramsay sedation scale points with mean CPOT total points (p=0.020) and "facial expression" subdimension points (p=0.023) before endotracheal tube and oral care. As the Ramsay sedation points of patients increased, the CPOT total points and "facial expression" subdimension points increased. This result is similar to the literature. The reason for this is that within the scope of the research, patients without sedation and with Ramsay sedation points of 2 (oriented, calm patients) and 3 (responding to verbal stimuli and abiding by orders) were included, so these patients experienced pain and expressed their

behavioral reaction to pain through facial expressions.

During endotracheal tube and oral care of patients, there was a positive and low-level significant correlation found between the duration of stay in intensive care and mean CPOT total points (p=0.05). As the duration of stay in intensive care lengthened, the total CPOT points increased. It is considered that as the duration of stay in intensive care lengthens, patients have increased sensitivity due to exposure to more painful procedures.

There were positive and low-level significant correlations identified during endotracheal tube and oral care of patients between Glasgow coma scale mean points and mean CPOT total points (p=0.029), "facial expression" and "body movement" subdimensions (p=0.004). During endotracheal tube and oral care of patients, as the Glasgow coma scale points increased, the CPOT total points, "facial expression" and "body movement" subdimension points increased. High Glasgow coma scale points are a finding showing increased levels of consciousness among patients. As a result, the observations of increased mean CPOT total points, "facial expression" and "body movement" subdimension points among patients with increased Glasgow coma scale points is an expected situation (40).

During endotracheal tube and oral care, there was a negative and low-level significant correlation present between Ramsay sedation scale points and CPOT "muscle tension" points (p=0.029). As the Ramsay sedation scale points increased during endotracheal tube and oral care, the CPOT "muscle tension" subdimension points fell. In the study by Güneş (22) as the sedation level of patients increased, they stated there were reduced pain points before and during positioning and aspiration. This result is similar to our study. In the literature, there was a significant negative correlation between behavioral pain points and Ramsay sedation scale points during painful procedures (41, 42).

Limitations and Recommendations

The research may be generalized to patients within the scope of the study in the relevant education-research hospital but cannot be generalized to all intubated intensive care patients. The collection of research data by a single researcher is another limitation of the study.

Considering the result that pain levels significantly increase during noninvasive interventions like oral care and endotracheal tube care of intensive care patients, it is recommended that nurses evaluate the pain status of patients not only during invasive procedures but also during noninvasive procedures.

CONCLUSIONS

This research determined that the pain levels of intubated patients in intensive care units were higher during endotracheal tube and oral

care compared to immediately before the intervention. Nurses' more attentive approach will lead to reduced levels of ignored pain experienced by patients in noninvasive procedures, to feel spiritually better, and to decrease recovery times.

Ethics Committee Approval: This study was approved by Ordu University Clinical Research Ethics Committee (28/06/2018-150).
Peer-review: Externally peer-reviewed.
Author Contributions: Concept: AK, NB; Design: AK, NB; Literature Search: AK, NB; Data Collection and Processing: AK; Analysis or Interpretation
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