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The impact of two distinct endotracheal tube fixation on the formation of pressure ulcer in the intensive care unit: A randomised controlled trial

Alev Genc[1] | **Tulin Yildiz**[2]

[1]Department of Surgical Diseases Nursing, Bahcesehir University, Institute of Health Sciences, Istanbul, Turkey

[2]Department of Surgical Diseases Nursing, Tekirdag Namık Kemal University, Institute of Health Sciences, Tekirdag, Turkey

Correspondence
Tulin Yildiz, RN PhD, Assoc. Prof., Tekirdag Namık Kemal University, Institute of Health Sciences, Department of Surgical Diseases Nursing, Tekirdag, Turkey.
Email: tyildiz70@hotmail.com

Abstract

The most common pressure ulcer associated with medical devices in the ICU is pressure injury associated with the endotracheal tube. We aimed to scrutinise the effects of two different techniques of endotracheal tube securement used in the ICU on the occurrence of pressure ulcers. This randomised clinical trial was conducted in 60 patients, 30 of which were intervention and 30 experimental, admittedin the ICU of a training and research hospitaldata were collected using the descriptive and clinical characteristics from the Braden Scale for predicting Pressure Sore Risk, the Pressure Ulcer Scale for healing, The International Staging System for Pressure Injuries and the Eilers Oral Assessment Guide. Based on the Braden Scale scores of the patients, we found that 98.3% of the cases were in the high-risk group before and after the intervention. We also found that the recovery was higher among patients in whom the bandage fixation method was applied compared to those in whom the fixation was done with an endotracheal tube holder.

KEYWORDS

endotracheal tube holder, intensive care, nursing care, pressure ulcer

Key Messages

- regarding the fixation of an endotracheal tube, it was found out that bandage fixation was better than the endotracheal tube holder technique in terms of both the pressure sore risk score difference and the tendency to fall, dislocate or remain stable, according to the Braden Scale for Predicting Pressure Sore Risk assessment results of the first and fourth days
- it was determined that the use of vasopressors, as well as low total protein, serum albumin, and haemoglobin levels, increased the formation of oral pressure injuries in the fixation of the endotracheal tube

1 | INTRODUCTION

An oral pressure ulcer is a localised injury to the oral mucosa and surrounding skin and/or underlying tissue due to the pressure and laceration caused by a medical instrument.[1] Various studies have revealed that the most common pressure injury among medical-device-related pressure ulcers is the oral pressure ulcer due to which

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patients experience pain, oral infection and deterioration in comfort (2. 3. 4). The skin might be an indicator of early pressure injury. Skin assessment is of great importance in preventing pressure ulcers because the skin condition has been identified as a significant risk factor for the occurrence of pressure ulcers. It is crucial to conduct studies to investigate medical device-related pressure ulcers during health care services to identify those ulcers associated with the medical device and to determine the risk factors and use safe materials in the prevention of those device-related pressure ulcers.[2] In this regard, using reliable endotracheal tube (ET) fixation can be helpful in ensuring patient comfort.

In the ICU, support is provided for organ dysfunction, notably for the cardiovascular system and respiratory system, the hemodynamic status of the patient can be monitoredcontinuously and patients who cannot meet their personal needs are to be provided with treatment and care. The use of technological instruments when delivering this treatment and care distinguishes the ICU from other units and indicates the desire to provide professional care to the most critically ill patients in the ICU.[3-5] Individuals who stay in the ICU (ICU) for a long time And who are connected to a ventilator immobile are faced with negative risk factors due to prolonged hospital stay, diagnosis, and treatment processes. One of the most considerable risk factors is pressure ulcer.[6] Medical devices are crucial components in providing care for critically ill patients; however, they are increasingly considered as a potential cause of pressure ulcers.[7] Medical device-related pressure ulcers can be caused by localised injury to the epidermis and/or underlying tissue due to the constant pressure of the device made of hard and rigid material.[7,8]

The most common pressure ulcer due to medical devices is the ET pressure injury.[8] The device that is attached by nasal or oral route to patients who need mechanical ventilator support in the ICU is called an "ET" and the procedure is termed intubation.[9] Maintaining intubation is the priority to save the lives of mechanically ventilated patients.[10] So, unplanned extubation or accidental movement of ET leads to life-threatening problems.[8] This happens also during reintubation following unplanned extubation, The laryngoscope may traumatise the mouth and pharynx and ET may traumatise the vocal cords and trachea, causing facial and oral mucosal pressure ulcers and increasing the likelihood of ventilator-related pneumonia, duration of stay in the ICU, duration of hospitalisation. and the number of days under mechanical ventilation.[10-12]

The primary way to prevent unwanted extubation is to properly securethe ET.[11] In order to stabilise ET, methods such as the use of adhesive tape, bandage. and endotracheal tube holder (ETT) are employed by considering such factors for the ease of use, cost, patient comfort and the effective use of time[7,12] . Yet, these methods used in the fixation of ET may cause pressure ulcers related to endotracheal intubation around the oral mucosa and lips.[13]

Intensive care nurses who are critical members of the interdisciplinary teamAre supposed to undertake the task of identifying possible risk factors in the ICU and take necessary measures to prevent and/or reduce the occurrence of such risk factors. Duties and responsibilities of the intensive care nurses include management of ET in the ICU, deciding on the appropriate ET fixation method for the intubated patient, fixing of ET safely, assessing the effects of ET on pressure ulcer risk factors, taking the necessary measures to prevent the occurrence of ET-related infection and maintaining the materials used in the fixation.[9] Remarkably, the studies investigating whether ET securement methods, which have been revealed through evidence-based practices used in nursing care have a role in the formation of oral pressure ulcers are quite limited. In this randomised controlled trial, we aimed to scrutinise the effects of two different endotracheal tube fixation techniques used in the ICU on the formation of pressure ulcers.

2 | MATERIALS AND METHODS

2.1 | Patients and methods

The study was conducted on a sample of 60 patients, 30 of whom were interventions and 30 trials, in the anaesthesia and reanimation ICU of a training and research hospital between July and November 2020, in a randomised controlled and experimental design. Within the limitations of nursing competency, in the study, data were collected using the descriptive and clinical characteristics form. The Braden Scale for predicting Pressure Sore Risk. The Pressure Ulcer Scale for healing (PUSH), International Staging System for Pressure Injuries and the Eilers' Oral Assessment Guide.

2.2 | Sample size and randomization

The power analysis of the sample was performed using the G*Power (3.1) computer program [8]. Using the means and standard deviations in Kim et al and Hampson et al,[7,8] the power analysis indicated that each group should comprise at least 30 patients. A total sample size of 60 patients should be adequate to detect the medium effects (d = 0.50) with a power of 80% using attest between means with alpha at 0.05. Hence. this study was completed with 60 patients. The 106 patients included

in this study were randomly assigned to two groups by a person other than the researchers and both groups were given a nickname. For randomization, software was used to generate random numbers (from 1 to 60) (http://www.randomizer.org/form.htm). Both researchers and the intensive care nurses blinded to the group assignment. The study procedure followed the CONSORT flow diagram (see Figure 1).

2.3 | Inclusion criteria for research

Patients who were aged between 18 and 65 years were on orotracheal intubated, had no face and neck trauma, hadno burns on the face, had no oral pressure ulcers, were connected to a mechanical ventilator, had no diabetes and gave verbal and written consent through their relatives to be involved in the study were also included in the study.

2.4 | ETHICS STATEMENT

Ethics committee approval was obtained from the "Clinical Research Ethical Committee of Marmara University Medical Faculty" and research permission was obtained from the "Istanbul Provincial Health Directorat" and written consent was obtained from the relatives of all patients for their patients to be included in the study.

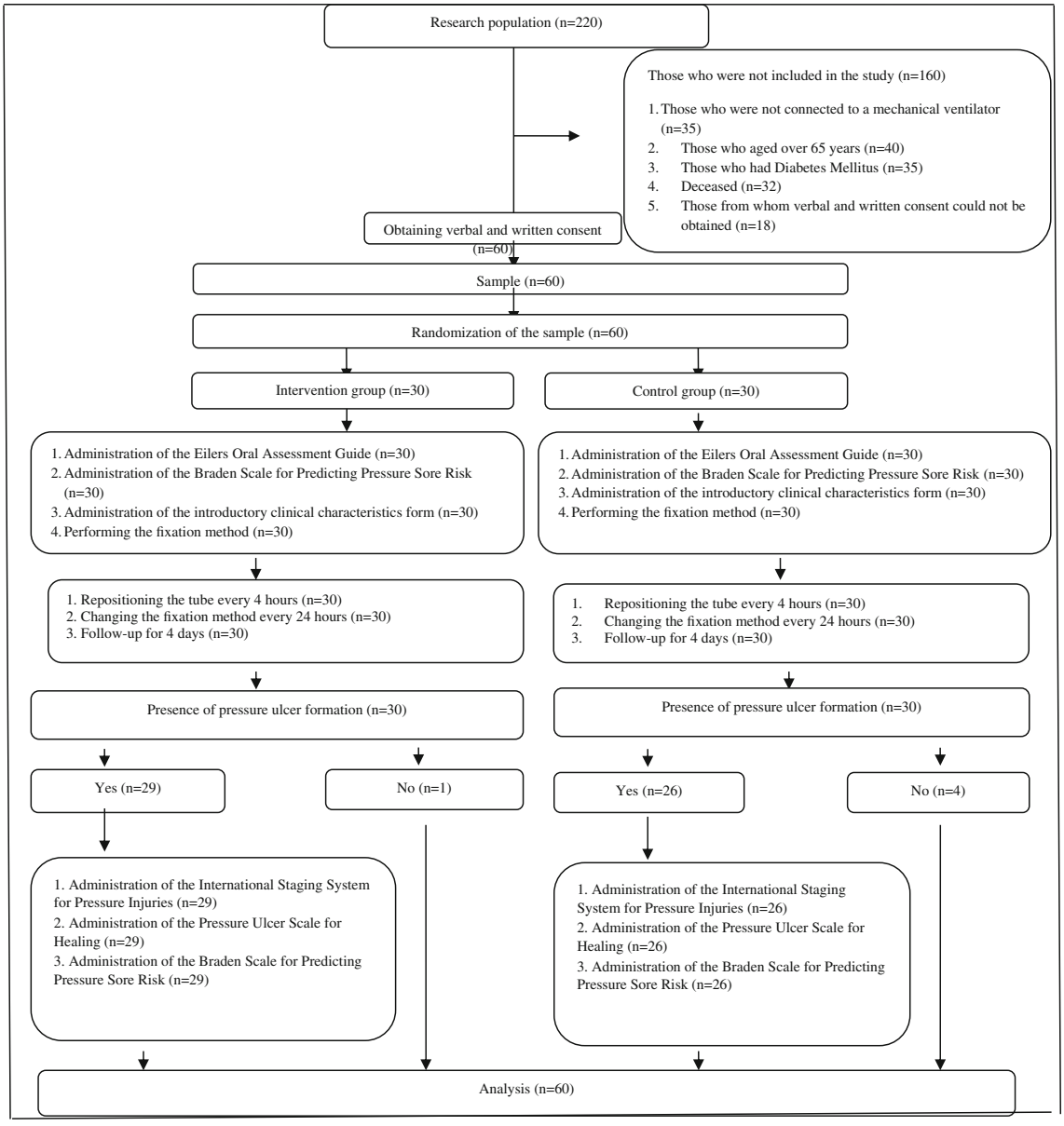

FIGURE 1 CONSORT flow diagram

2.5 | Data collection

The 60 patients constituting the sample were divided into two groups using the software that generated the random numbers (http://www.randomizer.org/form.htm). In line with the objective of the research, The groups were labelled as group A and group B and one of the two different endotracheal tube fixation methods was applied to the patients in each group. On the first day of the study, the oral mucosa of both groups was evaluated with the Eilers Oral Assessment Guide. Moreover, the pressure ulcer risk assessment of the patients in both groups was done using the Braden Scale for predicting Pressure Sore Risk. The demographic and medical information of the patients were collected using the descriptive and clinical characteristics form. The patients in both groups were followed up for 4 days in terms of oral pressure ulcers from the day they were intubated. During this period, the tube fixation of both groups was renewed every 24 hours and the tube was repositioned every 4 hours. At the end of the 4th day, the wound evaluation of the patients who developed pressure ulcers was made with the International Staging System for Pressure Injuries and the Pressure Ulcer Scale for healing.[7,14]

2.5.1 | Introductory and clinical characteristics form

The Demographic characteristics and medical information of the patient were included in this form.

2.5.2 | The Braden scale for predicting pressure sore risk

The Braden Pressure Sore risk Assessment scale was developed by Nancy Bergstrom and Barbara Braden in 1985 and the Turkish validity and reliability test of the scale was conducted by Oguz and Olgun (1997).[15,16] It involves 19 risk assessments and 6 sub-dimensions (sensory perception. moisture activity, mobility, nutrition, friction and shear). These risk factors are evaluated by nurses and scored between 6 and 23 points.

2.5.3 | The pressure ulcer scale for healing

The scale used to evaluate the healing process of the pressure wound consists of three sub-dimensions: surface area, amount of exudate and tissue type. The total score of the scale ranges from 0 to 17. An increase in the total score indicates the severity of the pressure ulcer (https://www.yoihd.org.tr/).[17]

2.5.4 | International staging system for pressure injuries

The clinical classification of pressure ulcers has been made by the international NPUAP-EPUAP pressure sore staging system (https://www.yoihd.org.tr/).[17]

2.5.5 | Eiler's oral assessment guide

It was developed by Eilers in 1988. The Eilers oral assessment guide enables the evaluation of the factors of voice, swallowing, lips, mucous membranes, tongue. Gingiva,teeth and saliva, voice and swallowing factors were excluded and the lips, mucous membranes, tongue, teeth,. gingiva and saliva were evaluated with Eiler's oral Assessment Guide via the inspection technique and +7 points were added to the total score as the patient was intubated after the evaluation. The total score provide information about the oral cavity health.[18]

2.6 | Data analysis

The IBM SPSS 22.0 package program was used while evaluating the data of the research. The normality distribution evaluation of the data was first performed with the Kolmogorov–Smirnov test. It was found that there was no normal distribution between the scales used and non-parametric tests were used in the analysis. In the difference analysis, Chi-square, Fisher's exact test and likelihood tests (χ^2) were used to compare the variables in which both sides had categorical characteristics. The Mann Whitney U and Wilcoxon signed rank tests were used to compare the variables with categorical parameters and the variables with numerical data. Significance was evaluated at the $P < .05$ level.

3 | RESULTS

The mean age of the patients included in the study was 51.03 ± 10.29, the majority of whom were males and with chronic diseases. The most common chronic disease in the patients was hypertension. Regarding smoking status, more than half (55%) of them were smokers. The mean number of days of the intubation of patients (n = 60) included in the study during their stay in the ICU was determined to be 1.15 ± 0.44 (Table 1).

TABLE 1 Information on the descriptive characteristics of patients

Characteristics	n	Percentage (%)
Sex		
Female	26	43.3
Male	34	56.7
Total	60	100.0
Presence of chronic disease		
Yes	36	60.0
No	24	40.0
Total	60	100.0
If yes. Which diseases?		
Hypertension	24	48.0
Chronic obstructive pulmonary disease	1	2.0
Coronary artery disease	19	38.0
Cancer	2	4.0
Other	4	8.0
Total	50	100.0
Smoking status		
Yes	33	55.0
No	27	45.0
Total	60	100.0

Characteristics	n	$\bar{X}\pm\sigma$	Minimum	Maximum
The duration for being intubated in the ICU	60	1.15 ± 0.44	1.00	3.00
Age (years)	60	51.03 ± 10.29	18.00	63.00
Weight (kg)	60	77.80 ± 9.09	150.00	182.00
Height (cm)	60	170.21 ± 9.35	60.00	95.00
BMI (kg/m ^{2})	60	26.85 ± 2.46	20.76	35.16

Considering the ET fixation methods, a significant difference was found between the patients with and without oral pressure ulcers in terms of vasopressor drug use in those with bandages (χ^2:13.929; $P = .01$). It was found that patients with oral pressure ulcers were using vasopressor medications. A significant difference was found between the patients with and without oral pressure ulcers regarding the nutritional risk score in whom the bandage method was applied for the fixation of ET (χ^2: 15.189; $P = .04$). Patients with oral pressure ulcers had a higher risk in terms of nutritional risk score, whereas most of the patients without oral pressure ulcers had a lower nutritional risk score. Furthermore, when the total protein, serum albumin, and haemoglobin levels of the patients who were applied bandages for the fixation of ET were analysed, a significant difference was found between the patients with and without oral pressure ulcers (χ^2: 12.692; $P = .03$; χ^2: 15.165; $P = .03$; χ^2: 6.887; $P = .03$) (Table 2).

A significant difference was foundwhen the endotracheal tube fixation method was compared based on the Braden Scale for predicting Pressure Sore Risk assessment results of the first and fourth day of the study ($z = -4.878$; $P = .000$). A decrease of 1.20 points was found between the Braden Pressure Ulcer Risk Assessment Scale score evaluated on the first day and the fourth day in the fixation of ET with the ETT method. Moreover, it was found that the scores of only two patients remained the same, whereas, the scores of 28 patients decreased. Thus, the risk of pressure ulcers increased. A significant difference was found, when the results on the first day and the fourth day were compared in the fixation of ET by the bandage method ($z = -3.622$; $P = .000$). There was a decrease of 1.06 points between the Braden pressure ulcer risk assessment scale score evaluated on the first day of the study and the score evaluated on the fourth day of the study. Besides, while the scores of only seven patients remained the same, the

TABLE 2 Pressure ulcer formation status of patients who underwent two different endotracheal tube fixation methods according to their introductory and clinical characteristics

	Bandage						Endotracheal tube holder					
	Pressure ulcer formation						Pressure ulcer formation					
	Present		Absent				Present		Absent			
Characteristics	**n**	**%**	**n**	**%**	χ^2	***P***	**n**	**%**	**n**	**%**	**χ2**	***P***
Sex												
Female	12	46.2	3	75.0	1.154	.299	11	37.9	0	0.0	0.599	.633
Male	14	53.8	1	25.0			18	62.1	1	100.0		
Intensive care hospitalisation diagnosis												
Internal medicine	5	19.2	0	0.0	5.052	.168	11	37.9	0	0.0	1.564	.668
Chest Diseases	12	46.2	1	25.0			4	13.8	0	0.0		
General Surgery	6	23.1	3	75.0			13	44.8	1	100.0		
Cardiology	3	11.5	0	0.0			1	3.4	0	0.0		
Presence of chronic disease												
Yes	17	65.4	1	25.0	2.356	.163	17	58.6	1	100.0	0.690	.600
No	9	34.6	3	75.0			12	41.4	0	0.0		
Smoking												
Yes	15	57.7	2	50.0	0.084	.591	15	51.7	1	100.0	0.905	.533
No	14	42.3	2	50.0			14	48.3	0	0.0		
Use of steroid medication												
Yes	19	73.1	2	50.0	0.879	.345	20	69.0	1	100.0	0.443	.700
No	7	26.9	2	50.0			9	31.0	0	0.0		
Vasopressor drug use												
Yes	26	100.0	2	50.0	**13.929**	**.01**	29	100.0	1	100.0	—	—
No	0	0.0	2	50.0			0	0.0	0	0.0		
Use of sedation												
Yes	25	96.2	3	75.0	2.493	.252	29	100.0	1	100.0	—	—
No	1	3.8	1	25.0			0	0.0	0	0.0		
Nutritional Risk Scoring												
Low Risk (<0–4)	1	3.8	3	75.0	15.189	.04	7	24.1	0	0.0	0.315	.767
High Risk (≥5–9)	25	96.2	1	25.0			22	75.9	1	100.0		
Endotracheal Tube Number												
7	1	3.8	0	0.0	1.262	.868	0	0.0	0	0.0	1.718	.424
7.5	5	19.2	1	25.0			9	31.0	0	0.0		
8	8	30.8	2	50.0			8	27.6	0	0.0		
8.5	11	42.3	1	25.0			12	41.4	1	100.0		
9	1	3.8	0	0.0			0	0.0	0	0.0		
Glasgow coma scale												
Stupor	5	19.2	2	50.0	2.181	.336	0	0.0	0	0.0	0.074	.933
Pericoma	3	11.5	0	0.0			2	6.9	0	0.0		
Coma	18	69.2	2	50.0			27	93.1	1	100.0		
Total protein level												
<5.4 g/dL	22	84.6	0	0.0	**12.692**	**.03**	21	72.4	0	0.0	2.414	.300
>5.4 g/dL	4	15.4	4	100.0			8	27.6	0	100.0		

(Continues)

TABLE 2 (Continued)

	Bandage						Endotracheal tube holder					
	Pressure ulcer formation						Pressure ulcer formation					
	Present		Absent				Present		Absent			
Characteristics	n	%	n	%	χ^2	*P*	n	%	n	%	χ2	*P*
Serum albumin level												
<3.5 g/dL	23	88.5	0	0.0	**15.165**	**.01**	21	72.4	0	0.0	2.414	.300
>3.5 g/dL	3	11.5	4	100.0			8	27.6	0	100.0		
Haemoglobin level												
<12 g/dL	22	84.6	1	25.0	**6.887**	**.03**	23	79.3	0	0.0	3.399	.233
>12 g/dL	4	15.4	3	75.0			6	20.7	1	100.0		
ASA Classification												
ASA II	0	0.0	0	0.0	3.077		1	3.4	0	0.0	1.564	.458
ASA III	14	53.8	4	100.0	0.112		13	44.8	1	100.0		
ASA IV	12	46.2	0	0.0			15	51.7	0	0.0		
APACHE II Score												
0–10	0	0.0	0	0.0	2.518		1	3.4	0	0.0	2.740	.254
10–20	4	15.4	2	50.0	0.284		7	24.1	1	100.0		
20–35	20	76.9	2	50.0			21	72.4	0	0.0		
≥35	2	7.7	0	0.0			0	0.0	0	0.0		

Note: $P < 0.01$. Bold values indicate that they are statistically significant.

TABLE 3 Comparison of the first and fourth day according to the score of the Braden scale for predicting pressure sore risk

Method used	n	Braden pressure ulcer risk measures	Tendency	z	*P*
Endotracheal tube holder	30	Measurement 1: 9.10 ± 1.21	Negative: 28	−4878	.000*
	30	Measurement 2: 7.90 ± 1.06	Positive: 0		
		M_2 - M_1 *Difference*: 1.20	Equal: 2		
Bandage	30	Measurement 1: 9.76 ± 1.40	Negative: 22	−3622	.000*
	30	Measurement 2: 8.70 ± 1.53	Positive: 1		
		M_2 - M_1 *Difference*: 1.06	Equal: 7		

*$P < 0.001$.

score of one patient was found to be high, showing a positive trend. However, 22 of them were found to have decreased scores, thus increasing the risk of pressure ulcers. When two methods were compared, it was found that the bandage method was better than the ETT method in terms of both the pressure ulcer risk score difference and the tendency to fall, dislocate or remain stable (Table 3).

When the results of the endotracheal tube fixation method and the Pressure Ulcer Scale for Healing were compared, a significant difference was found between the performed methods (U: −4.721; $P = .000 < .05$). The Pressure Ulcer Scale for the healing score of the patients who were applied bandage in the fixation of ET was determined to be lower than the score of the patients who were applied with ETT in the fixation of ET. Hence, it was concluded that the bandage fixation method showed more improvement than the ETT fixation method. When the ET fixation method and the pressure ulcer scale for healing sub-dimension were considered (tissue surface area and tissue type,. which are sub-dimensions of the pressure wound healing assessment scale), results were compared, the amount of exudate, which is the sub-dimension of the Pressure Ulcer Scale for Healing, was not taken into consideration as the presence of exudate was not detected in the pressure ulcer. A

TABLE 4 Comparison of endotracheal tube fixation method and The Pressure Ulcer Scale for Healing sub-dimension (tissue surface area and tissue type) results

	n	Median	$\bar{x} \pm \sigma$	U	*P*
The pressure ulcer scale for healing results					
Endotracheal tube holder	29	6	5.86 ± 1.27	−4721	0000*
Bandage	26	4	3,84 ± 1,12		
Tissue surface area (Length × Width)					
Endotracheal tube holder	29	5	5,12 ± 1,05	−4812	0000*
Bandage	26	3	3,30 ± 1,08		
Tissue Type					
Endotracheal tube holder	29	1	0,88 ± 0,33	−1595	0.111
Bandage	26	1	0,70 ± 0,46		

*Mann Whitney U, $P < .05$.

significant difference was found between the applied methods when the ET fixation method was applied to the patient and the surface area of pressure ulcer were compared (u: −4.812; $P = .000 < .05$). The size of the pressure ulcer due to ET fixation with ETT was significantly greater than the size of the pressure ulcer that resulted from ET fixation with gauze. No significant difference was found between the methods when the ET fixation method applied to the patient and the tissue type of the pressure ulcer were compared ($P > .05$) (Table 4).

4 | DISCUSSION

Individual and clinical characteristics are among the most important risk factors in the formation of pressure ulcers.[19] From this study, we found that the majority of the participants were male and had a chronic disease; they also smoked. Hanonu et al revealed, in their prospective descriptive study, that advanced age, obesity and risk factors due to chronic disease impact the formation of medical-device-related pressure ulcers.

Malnutrition, loss of emotional perception and lack of movement, hypoalbuminemia, anaemia, vasopressor therapy, steroid therapy.and sedative medication are the important risk factors in the formation of pressure ulcers.[7,8,10,13,19,20] In this study, it was found that most of the patients had a high-risk nutritional risk score and were in the coma, based on the Glasgow Coma Scale. Moreover, it was found that the majority of the patients who received steroid and vasopressor medication were sedated and had low total protein and albumin levels. In our study, a significant difference was found between the formation of low total protein, serum albumin and haemoglobin levels in patients in whom ET fixation was performed with the bandage method, whereas, there was no difference between the formation of oral pressure ulcers in patients to whom ET fixation was applied with the ETT method. Kim et al[8] found a significant difference between total protein level and oral pressure ulcer formation ($P = .03$). Karsli et al[21] found a significant difference between total protein level and stage of ulcer in their study, whereas, Hampson et al found no significant difference between serum albumin level and oral pressure ulcer formation. However, Kwon et al determined a significant difference between oral pressure ulcer formation and serum albumin levels.[7,10] In addition to that, Kim et al[8] study supported ourobservation . In our study, a significant difference was found between the patients with and without oral pressure ulcers when the serum albumin level was evaluated in patients in whom ET fixation was performed using the bandage method. The serum albumin level was determined to be below 3.5 g/dL in 88.5% of patients with oral pressure ulcers.

Receiving steroid medication might increase the risk of medical device-related pressure ulcers.[14] In the study of Hampson et al,[7] no significant difference was found between the use of steroid drugs and the formation of oral pressure ulcers. On the other hand, in the study of Kwon et al,[10] found a significant difference between the formation of oral pressure ulcers and the use of steroid medication. However, in our study, when the steroid drug use status was analysed in patients who were subjected to both ET fixation methods, no significant difference was found between patients with and without oral pressure ulcers.

Hanonu et al[14] revealed that as the haemoglobin level decreases, the risk of developing a medical device-related pressure ulcer is 1.17 times higher than in a patient with a normal haemoglobin level. Kim et al[8] detected a significant difference between oral pressure ulcer formation and haemoglobin level. Likewise, in our study, when the haemoglobin level was examined in patients who underwent endotracheal tube fixation with a bandage, a significant difference was found between patients with oral pressure ulcers and those without. It was found that the haemoglobin level of the patients with oral pressure ulcers

remained below 12 g/dL, while it was above 12 g/dL in the patients without oral pressure ulcers.

It has been suggested in the literature that the force applied by ETT on the face during head-up and rotation is nearly 260 mmHg/cm and when the pressure distributed to the oral mucosa exceeds 32 mmHg, it might result in vascular occlusion and oral pressure ulcers.[22] Zaratkiewicz et al,[23] on the other hand, used a bite block in the first stage and two different ETTs in the second and third stages of the study in their study, which started with the retrospective stage and carried out the second and third stages with the prospective interventional study method They found that the incidence of pressure ulcer development due to ET was reduced from 1.25% to 0.2%. Hanonu et al,[14] in their study, found that the risk of medical device-related pressure ulcer formation increased 1.81 times as the Braden Scale for predicting Pressure Sore Risk score shifted from low risk to high risk and that there was a significant difference between the Braden Scale for predicting Pressure Sore Risk score and the risk of medical-device-related pressure ulcers. In the study, it was found that the bandage method was better than the ETT method in terms of both the pressure ulcer risk score difference and the tendency to fall. Dislocate or remain fixed.

The Pressure Ulcer Scale for Healing developed by NPUAP enables assessment of the condition of the wound over time. Zeigler et al[24] suggested, in their study, that the Pressure Ulcer Scale for Healing supports the clinical decision-making process of the nurse during the evaluation, follow-up and recovery process of the pressure ulcer. In the study, the Pressure Ulcer Healing Assessment score of the patients who were applied bandage in the fixation of ET was found to be lower than the score of the patients in whom the fixation was performed via ETT. Hence, it was concluded that the bandage fixation method showed more improvement than the ETT fixation method. To eliminate oral pressure ulcers, which can be prevented by nursing care and recognised as a quality indicator, the decision-making process of the nurse is crucial and care should be supported with evidence-based practices.

5 | CONCLUSION

In the study, we aimed to investigate the impact of two different ET fixation methods used in the ICU on the formation of oral pressure ulcers. We found out that the bandage method was better than the ETT method in terms of both the Pressure Ulcer Risk Score difference and the tendency to fall, dislocate or remain fixed. Based on the scores obtained from the Pressure Ulcer Scale for Healing, the patients who were subjected to the bandage fixation method showed more improvement compared to the other groups. Deciding on the proper ET fixation method for the intubated patient and fixation of ET safely are vital in the care provided to intensive care patients. Using a safe ET fixation method helps in ensuring the comfort of patients and it is recommended to use evidence-based practices in ET fixation methods.

ACKNOWLEDGEMENTS

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data have analysed during the current study are available from the corresponding author on reasonablereques.

ETHICS STATEMENT

The study was approved by the Clinical Ethical Committee of Marmara University Medical Faculty, No: 09.2020.264. Clinical Trial No: NCT05142579.

ORCID

Tulin Yildiz https://orcid.org/0000-0002-4981-6671

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