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Risk predictors of post-extubation dysphagia

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Abstract:
Background: Post-extubation dysphagia is frequent symptom among hospitalized Patients in the critical care unit. It had been discovered that 41% of critically ill patients who require endotracheal intubation experience post-extubation dysphagia. **Aim:** The aim of the current study was to identify risk predictors post-extubation dysphagia. **Study design:** A descriptive research design was utilized in the current study. **Setting:** The current study was conducted in the intensive care units (general intensive care unit, traumatic unit and critical care unit) At Assiut university hospital. **Subject:** A convenience sampling of 100 adult patients. **Tools: Tool (1):** " Contributing factors for post-extubation assessment, **Tool (2):** Gugging Swallow Screen bedside swallowing screening. **Results:** It was found that the greatest percentage of studied patients suffering from moderate dysphagia **(60.4 %),** with significant statistically difference between some of other risk factors .The other risk factors include duration of intubation, gastric tube size, gastric tube period, and length of stay in the intensive care unit and occurrence of post-extubation dysphasia with P value equal (p value<0.01). **Conclusions:** There were many variables that could cause post-extubation dysphasia. These variables include therapeutic-related variables, duration of end tracheal tube and size of the gastric tube. Additionally, in critically ill patients who have just been extubated, the nurse essential should perform an early detection and management of dysphagia. **Recommendation:** In order to predict and treat post-extubation dysphasia, nurses should periodically check on the critically ill patients who have been intubated for early signs of dysphagia.

Keywords: Endotracheal intubation, Post-extubation dysphagia & Risk predictors

Introduction:
Mechanical ventilation performed through endotracheal intubation, which is frequently a crucial and life-saving procedure. Although endotracheal intubation is a well-established operation that has been used since the late eighteenth century, there are some risks involved, including laryngeal damage and post-extubation dysphagia (PED) (**McIntyre et al., 2020**).

Post-extubation dysphagia is the inability or difficulty moving food and liquids safely and effectively from the mouth to the stomach **(Rajesh et al., 2020)**.

Dysphagia could also be an objective finding of dysfunction in any of the phases of swallowing either through oral, pharyngeal, and/or esophageal (**Dewan et al., 2021**).

Six potential major mechanisms leading to the development of post-extubation dysphagia (PED) among critically ill patients who had been proposed. To gastroesophageal reflux, and asynchronous breathing/swallowing. Although some cases of dysphagia is an evident to an underlying disease as (e.g., acute stroke patients), dysphagia also observed among a wide range of critically ill patients, including those following elective cardiac surgery. **(Perren et al., 2019)**

Also (**Phothikun et al., 2022**), reported numerous mechanisms of post-extubating dysphagia, PED, which may be influenced by a variety of factors such as length of intubation, size of the endotracheal tube, number of intubation attempts made, as re-intubation; may also be linked to trauma, mucosal inflammation, or muscle function that affects swallowing.

The most common signs and symptoms of PED that increase the risk for aspiration include difficulty initiating swallowing, repetitive swallowing, taking longer time or more effort to chew or swallow, drooling and poor oral hygiene, complaining of pain during swallowing, lack of a cough reflex, gurgling sounding voice, coughing or gagging, chocking during or after eating or drinking, and recurrent pneumonia. (**Oliveira et al., 2018)**

Common complications of PED include pulmonary aspiration leading to aspiration pneumonia, increased reintubation rates, inadequate nutritional support, prolonged use of feeding tubes with delayed return to oral feeding, long stays in ICU and hospital with poor quality of life **(Phothikun et al., 2022).** Malnutrition and dehydration are also connected to

dysphagia. Therefore, it is important that clinicians should be aware about the ways to identify and manage dysphagia (**Dobak & Kelly, 2021**)

Early identification and beginning of appropriate interventions could reduce dysphagia-related complications and improve referral quality, health outcomes, and quality of life for individuals with dysphagia. In acute settings, nurses should be available on 24-hour basis; in order to distinguish individuals with dysphagia and begin interventions as early as possible that may prevent further complications. (**McGinnis et al., 2019**)

Significance of the study:

(Dobak & Kelly, 2021) found that Mechanical ventilation is necessary for 20% to 40% of adult who admitted to ICU and showed that PED was occurred among 84% of the patients, after excluding individuals with stroke and/or neuromuscular disease.

According to current records in the three critical care units (Trauma ICU, General ICU, and Anesthesia ICU) at Assuit university Hospitals from 2020-2021 it was documented that approximately (1200-1260) patients admitted to these units, a major percent of them (1080-1135) approximately (90 %) are intubated ETT and at high risk for PED. So it was suggest that critical care nurses should identify patients with such complications early and mange it as soon as possible. So, it is very important to perform the study to identify the risk predictors for patients with PED.

Aims of the study

The present study was conducted to identify risk predictors post-extubating dysphagia at Assiut University Hospital.

Patients and Methods

Design: Descriptive research design was conducted in this study.

Setting: This study was conducted in three ICUs (general intensive care unit, traumatic unit and critical care unit) at Assuit University Hospitals. The bed capacities of these units were 18, 16, and 20 beds respectively.

Research question: What are the risk predictors of post-extubation dysphasia?

Sampling:

Convenient sample of 100 adult patients intubated for more than 48 hours and between 18-60 years old, hemodynamically stable, and their Glasgow Coma Scale score was >14 points when admitted to the previously mentioned units. Patients who were need for tracheostomy or continuous noninvasive positive pressure ventilation following extubation were excluded from the study. According to the inclusion criteria, the study sample was collected within six months period (from August, 2021 to January, 2022).

The sample size was calculated by power analysis using (Epi-Info program) applying the following information:

- Expected frequency =50%
- Acceptance error =10%
- Confidence coefficient =95%
- Design effect=1
- Power=80%.

Study tools: Two main tools were used during data collection, the first was developed by the researcher and the second was adopted.

Tool one: "Contributing factors for post-extubation assessment ":

It was developed by the researcher after extensive review of the related literature. (Chen & Qian, 2020; McIntyre et al., 2021; Oliveira et al., 2018). This tool was used to assess patient profile and condition, and divided into two parts:

Part 1: Demographic and clinical data of the patients:

This part included patient's demographic data such as age, sex, and **Patient** clinical data as the past medical history, date of admission, length of stay in ICU, medications. As well as **Mechanical ventilation data** i**nvasive device data as** (ETT and NGT: size, and duration of intubation) also include **acute physiological and chronic health evaluation II using (APACHE II) s**core to measure the severity of the disease. **(Jaganath, 2020)**. It also include **Neurological data as** (Glasgow coma scale (GCS), Confusion Method Assessment for ICU (CAM ICU), and Richmond Agitation-Sedation Scale (RASS score).

Part 2: including assessment of the patients' Hemodynamic parameters as the heart rate, blood pressure &mean arterial pressure, CVP, and urine output.

Tool two: Gugging Swallow Screen (GuSS-ICU) bedside swallowing screening tool: It is the post-extubating swallowing screen. This tool was used to detecting swallowing disorders for patient in ICU. It was adopted by the researchers from **(Trapl-grundschober et al., 2018)**

Methods: Data was collected in two phases:

Preparatory phase:

1. Approval from the ethical committee, faculty of nursing, Assiut University was obtained.
2. Permission to conduct the study was obtained from the hospital responsible authorities in anesthesiology department, critical care, and emergency ICU after explaining the aim and nature of the study.
3. Oral consent was obtained from the patients. It included the aim of the study, potential benefits,

risks and discomforts from participation and the right to refuse to participate in the study. Patients' privacy, anonymity and confidentiality of the data collected were maintained during the implementation of the study.

4. The tool was developed by the researcher based on the relevant literature reviewing.
5. Content validity was assessed by five experts in the field of the critical care and anesthesiology, including three assistant professors of the critical care (faculty of nursing, Alexandria University) and two professors in anesthesiology (faculty of medicine, Assiut University).
6. Reliability of the tool was assessed using the appropriate tests.
7. Validity and reliability of Tool Two were performed for GUSS by (Abdel Hamid & Abo-Hassebal, 2017) According to flexible endoscopic examination of swallowing (FEES) results, (66.7%) patients were at a risk for aspiration, whereas (71.4%) patients were rated to be at a risk according to the GUSS results. By using the GUSS test, two patients were diagnosed.

Ethical Consideration:

1. Research proposal was approved from Ethical Committee in the Faculty of Nursing.
2. There is no risk for study subject during application of the research.
3. The study was following the common ethical principles in clinical research.
4. 4-Oral consent was obtained from parents that are illing to participate in the study, after explaining the nature and purpose of the study.
5. Patients were assured that the data of this research will be used only for the purpose of research.
6. Confidentiality and anonymity was assured.
7. Patients have the right to refuse to participate and or to withdraw from the study without any rational and at any time.

The pilot study:

It was carried out on 5 patients (10 % from the sample) to assess the clarity and applicability of the tools.

Data collection phase:

1. Data were collected according to the inclusion criteria for about six months (from August 2021 to January, 2022).
2. All newly admitted patients to the previously mentioned units who met the inclusion criteria were enrolled in this study.
3. Patients' demographic and clinical profiles were assessed for each patient on admission by using tool one. The demographic and clinical data were obtained from patients, and charts. Presence of feeding tube, duration, and size were recorded by the researcher. Glasgow coma scale (GCS) and CAM-ICU score were calculated for each patient during intubation and post extubating to assess patients with impaired level of consciousness and cognitive status using part I of tool one.
4. In addition, size of tracheal tube was recorded upon intubation, duration of tracheal tube was calculated and recorded, Cuff pressures were observed during intubation period by sphygmomanometer.
5. The GUSS consists of two tests:

The indirect swallowing test (test 1), which includes patients who have been intubated > 72 hr., extubated >24 hr., RASS score, the CAM-ICU, fed via a naos-gastric tube (NGT), stridor present, ask patient to cough, and observe a saliva swallow, drooling, and voice change)

The direct swallowing test (test 2), which consists of 3 subtests, these subtests were performed sequentially. This would include administered of water, than semi-solid food and lastly bread with four distinct signs that were being assessed for deglutition, coughing, drooling and voice change. Whether the patient was able to pass this final stage, the health care providers would determine whether patients become able to tolerate the free diet or not.

Each subtest has a maximum 5 points which could be reached. The highest total score was twenty points that denotes normal swallowing ability without aspiration risk. In which total 4 levels of severity could be determined:

- 0-9 Points: severe dysphagia and high risk for aspiration.
- 10-14 Points: moderate dysphagia and moderate risk of aspiration.
- 15-19 Points: mild dysphagia with low risk of aspiration.
- 20 Points: normal swallowing ability.

- At the end of the study evaluate the incidence of dysphagia in recently extubated patients, and determines the patient who at risk for dysphagia

Statistical design:

The data were tested for normality using the Anderson-Darling test and for homogeneity variances prior to further statistical analysis. Categorical variables were described by **number and percent** (N, %), where continuous variables described by mean and standard deviation **(Mean, SD)**.**Chi-square test** and fisher exact test used to compare between categorical variables where compare between continuous variables **ANOVA TEST .A two-tailed p < 0.05** was considered statistically significant .All analyses were performed with the **IBM SPSS 20.0** software.

Results:

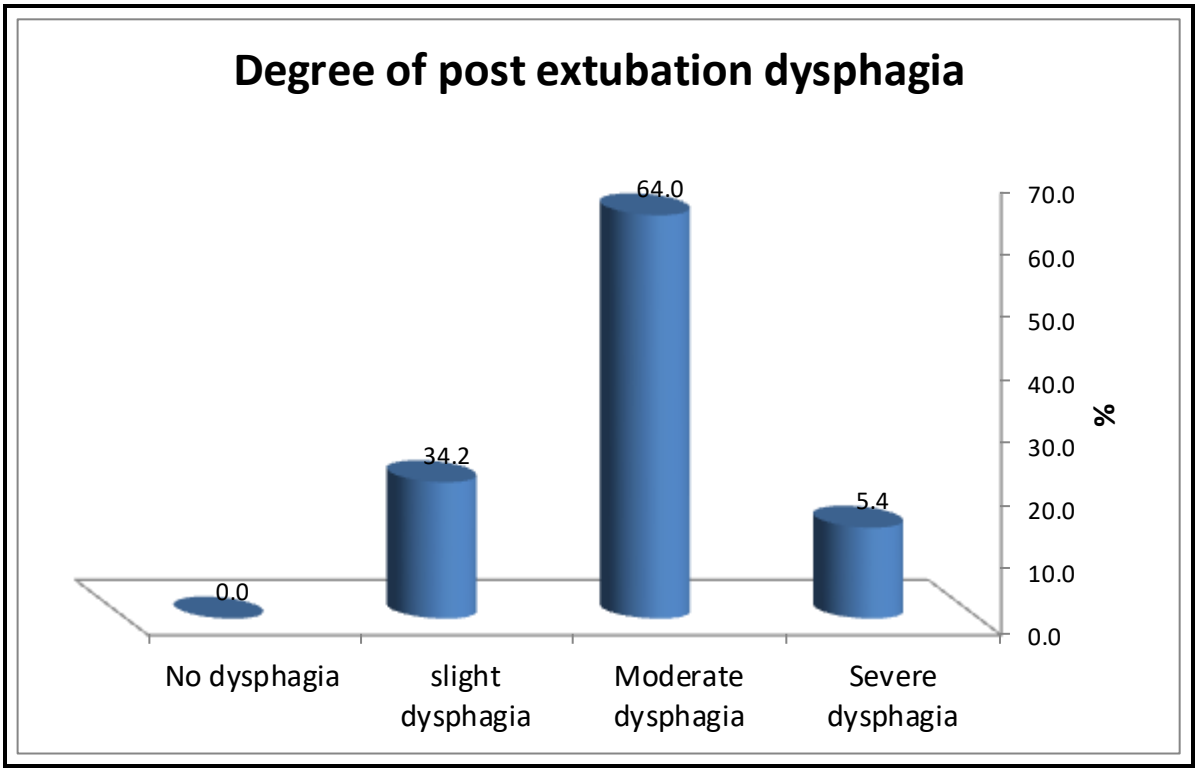

Figure (1): Distribution of the studied patients according to degree of post-extubation dysphagia (PED

Table (1): Distribution of patient's characteristics according to the demographic characteristics with occurrence of post-extubation dysphagia (PED) among the studied patients (n= 111)

	Slight dysphagia		Moderate dysphagia		Severe dysphagia		P. value
	No	%	No	%	No	%	
Age group							
18- 30 years	14	36.8	22	32.8	**1**	**16.7**	0.623
31- 40 years	2	5.3	12	17.9	**1**	**16.7**	
41- 50 years	6	15.8	7	10.4	**1**	**16.7**	
51- 60	16	42.1	26	38.8	**3**	**50.0**	
Sex							
Male	26	68.4	58	86.6	**5**	**83.3**	0.080
Female	12	31.6	9	13.4	**1**	**16.7**	

Chi square test for qualitative data between the two groups or more
** Significant level at P value < 0.05*
*** Significant level at P value < 0.01*

Table (2): Distribution of the clinical data related to admission data and length of ICU stay with occurrence of post-extubation dysphagia (PED) for the studied patients. (n= 111)

Clinical data		Slight dysphagia		Moderate dysphagia		Severe dysphagia		P.value
		No	%	No	%	No	%	
Admission data	**Diagnosis**							
	Cardiovascular disorder	6	15.8	5	7.5	1	16.7	0.374
	Respiratory disorder	17	44.7	26	38.8	5	83.3	0.105
	Neurovascular disorder	24	63.2	46	68.7	4	66.7	0.848
	Gastrointestinal disorder	7	18.4	10	14.9	1	16.7	0.896
	Medication							
	CNS Depressant	19	50.0	27	40.3	3	50.0	.602
	Potassium chloride	2	5.3	2	3.0	1	16.7	.290
	Corticosteroid	20	52.6	22	32.8	4	66.7	.061
	Antibiotics	38	100.0	67	100.0	6	100.0	-
	Anti-cholinergic	17	44.7	15	22.4	4	66.7	.012
	Antiplatelet	23	60.5	35	52.2	2	33.3	.413
	Antiarrhythmic	1	2.6	2	3.0	0	0.0	.910
	Diuretics	4	10.5	6	9.0	1	16.7	.822
	Antihistamines	0	0.0	1	1.5	0	0.0	.718
	NSAID	35	92.1	65	97	6	100	0.436
	Apache II score of each degree of post-extubating dysphagia							
	Mean+SD	11.08±4.75		10.96±5.09		11.5±5.32		0.965
length of ICU stay								
Less than 10 days		11	28.9	5	7.5	1	16.7	**0.001****
From 10-15 Day		19	50.0	21	31.3	1	16.7	
More than 15 days		8	21.1	41	61.2	4	66.7	

- CNS: Central nervous system. *NSAID: Non steroid anti- inflammatory drug.*
- ICU: Intensive care unit.
Chi square test for qualitative data between the two groups or more
One-way Anova quantitative data between the three groups or more
**Significant level at P value < 0.05*
***Significant level at P value < 0.01*

Table (3): Distribution of invasive devices related to intubation with occurrence of post -extubation dysphagia (PED) among the studied patients. (n= 111)

	Slight dysphagia		Moderate dysphagia		Severe dysphagia		P.value
	No	%	No	%	No	%	
Size of Endotracheal tube							
6.00	3	7.9	2	3.0	1	16.7	
6.50	4	10.5	12	17.9	0	0.0	
7.00	21	55.3	31	46.3	2	33.3	0.339
7.50	10	26.3	19	28.4	2	33.3	
8.00	0	0.0	1	1.5	0	0.0	
8.50	0	0.0	2	3.0	1	16.7	
Duration of Endotracheal tube intubation							
Less than 10 days	30	78.9	35	52.2	2	33.3	
From 10-15 days	7	18.4	24	35.8	2	33.3	**0.019***
More than 15 days	1	2.6	8	11.9	2	33.3	
Cuff Pressure inflation during period of intubation							
Under inflation	0	0.0	2	3.0	0	0.0	0.190
Normal range	33	86.8	53	79.1	3	50.0	
Over inflation	5	13.2	12	17.9	3	50.0	

	Slight dysphagia		Moderate dysphagia		Severe dysphagia		P.value
	No	%	No	%	No	%	
Size of Gastric tube							
12	0	0.0	0	0.0	1	16.7	**0.005****
14	1	2.6	2	3.0	0	0.0	
16	21	55.3	31	46.3	3	50.0	
18	16	42.1	34	50.7	2	33.3	
Duration of gastric tube intubation							
Less than 10 days	29	76.3	24	35.8	1	16.7	**0.001****
From 10-15 days	5	13.2	28	41.8	3	50.0	
More than 15 days	4	10.5	15	22.4	2	33.3	

Chi square test for qualitative data between the two groups or more
**Significant level at P value < 0.05* ***Significant level at P value < 0.01*

Figure (1): Showed that more than half of the patients (60.4 %) complained of moderate dysphagia.
Table (1): Represented the distribution of patient's demographic characteristics according to occurrence of post-extubation dysphagia (PED) among the studied patients. It was noticed that 40.5 % of the studied patients aged between 51-60 years old. Regarding to sex, the majority of the studied patients (80.2 %) were male. And there was no statistically significant association between occurrence of PED and age or sex with (p=0.623), (p=0.080) respectively.
Table (2): It revealed distribution of the clinical data related to admission and duration of ICU stay with occurrence of post-extubation dysphagia (PED) among the studied patients. It was noticed that over half of the studied patients admitted diagnosis with neurovascular disorder. As regard to the administered medications, it reveals that antibiotics were prescribed to all the studied patients. Moreover, NSAID were administered to most of the studied patients (95.5%) additionally, antiplatelet, CNS depressant were prescribed to 54.1%, 44.1%, of the patients respectively. the mean and standard deviation of the APACHE II score of patients with three degrees dysphagia were (11.08±4.75, 10.96±5.09, 11.5±5.32), respectively. Moreover, nearly half of patients (47.7%) stayed in ICU more than 15 days with statistical significant difference between the occurrence of (PED) and length of ICU stay with (P value<0.01).
Table (3): Revealed distribution of the invasive devices related to intubation with occurrence of post-extubation dysphagia (PED) for the studied patients. It was discovered that approximately half of patients (48.6%) had endotracheal tube size (7), more than half of patients (60.4%) were intubated (From 72hrs. -10 days), and nearly all patients (80.2%) were within normal range (20-25 mmhg). Concerning the gastric tube, it was noticed that almost half of patients (49.5 %, 48.6) had gastric tube size (16 French) and stayed ICU less than 10 days respectively with statistically significant difference between occurrence of (PED) and duration of intubation with (P value< 0.05). Also, there was statistical significant difference between occurrence of (PED), size of gastric tube and duration of gastric tube intubation with (P value< 0.01).

Discussion:

Approximately 60% of the critically ill patients admitted to the ICU require endotracheal intubation to keep the airway open and allow invasive mechanical ventilation. Tracheal intubation is a procedure to help people breathe properly and to open and protect their airways if they cannot breathe properly on their own **(Smischney et al., 2018)**
While endotracheal intubation has taken a lot of attention, particularly when the airway is aspirated, the extubation technique has not been taken into account. So, it is necessary for the anesthetists to increase their awareness about the risks associated with extubation, including high cuff pressure, difficult intubation and long intubation time to prevent and inhibit the complications **(Sehgal et al., 2018) .**
In the current study, it was found that more than half of the patient had moderate post-extubation dysphagia. **This study's findings concurred with those of** (Oliveira et al., 2018) who found that more than half of the studied patients had a moderate degree of dysphagia. On the other hand this result disagreed with the study conducted by **(Warda et al., 2018)** who observed that below half of the studied patients had a moderate degree of dysphagia .
As regard to **Age,** the present study findings revealed that less than half of patients (40.5%) aged between fifty-one and sixty years old. This findings was supported by **(Duncan et al., 2020)** who observed that nearly half of patients were aged from fifty to sixty. And was encouraged by **(Sassi et al., 2018)** who found that most of patients were older age from

fifty to sixty. **However, this was in opposition to (Brodsky et al., 2021)** who noted that nearly half of patients were between the ages of forty and sixty-five years old.

Also, there was **no statistical significance difference** between occurrence of post-extubation dysphagia (PED) and age. This result was compatible with **(Yang et al., 2020)** who showed that there was no statistically significant difference between occurrence of PED and age and documented in his study that that patient age did not correspond with the occurrence of PED. On the other hand this result was disagree with **(Warda et al., 2018)** who found that there was statistical significance association between age and post -extubation dysphagia .

Based on the results of the current study, men made up the majority of the patients that were studied. **This result was consistent with (Tanaka et al., 2022)** study who found that more than half of the patients were male. Also, this results agreed with (Oliveira et al., 2018) who noticed that most of the studied patients were male and also, it was compatible with **(Park et al., 2017)** who found that most of the studied patients were male. **on the other hand this result disagreed with (Mouawad & Ahluwalia, 2017)** who found that most of the patients were female.

And there was **no statistically significance difference** between the occurrence of post-extubation dysphagia (PED) and patient's sex. **This result was consistent with (Ambika et al., 2019)** who found that there was no statically significant difference between gender and occurrence of PED .also this result was in the line with the study done by **(McIntyre et al., 2020)** who showed there was no significant between gender and occurrence of PED. On the other hand, this finding was in conflict with research done by **(Mouawad & Ahluwalia 2017**), who found a statistically significant difference between PED occurrence and patient's sex. The current study also showed that the most common diagnosis in this study was neurovascular disorders e.g head and spinal trauma .**This may be due to** that most of studied patients were males which they most of them exposed to hazards at work and road accidents. This also in the same line with **(Duncan et al., 2020)** who found that half of patients admitted with medical diagnosis head and spinal trauma, in addition this was also supported by (**McIntyre et al., 2021**) who observed that the reason for admission of more than half of patients was trauma. **On the other hand,** this result disagreed with (**Marvin et al., 2019**) who found in his study that most of medical diagnosis were respiratory diseases.

And there was **no statistical significance difference** between occurrence of post-extubation dysphagia (PED) and patient's diagnosis. **This result was matched with(Tsai et al., 2016)**who noticed that there was **no statistically significant difference** between medical diagnosis and PED occurrence. On the contrary this finding was at odds with that of (**Marvin et al., 2019**), who discovered that there was statistically significant **difference** between the diagnosis and occurrence of (PED) Regarding to **duration of ICU stay**, the present study showed that nearly half of the studied patients stayed in ICU more than fifteen days. **This result was in the same line with(Covid- et al., 2021)** who found most of their studied patients stayed twenty four days in ICU. On the contrary **this result was not matched with(Zuercher et al., 2019)**who noticed that nearly half of study patients stayed from seven to fourteen days. This study showed that there was **statistically significance difference** between occurrence of (PED) and length of ICU stay. **This result may be due to** delayed return to oral intake, aspiration pneumonia associated with PED. This result was matched with **(Zeng et al., 2021)** who found there **was statistically significance difference** between duration of ICU stay and occurrence of post-extubation dysphagia. In addition this result agree with **(Zuercher et al., 2019)** who documented that there was **statistically significance difference** between duration of ICU stay and occurrence of (PED). **On the other hand** this result was disagree with **(Lakhani et al.,2017)** study who found that there was **no statistically significance difference** between length of ICU stay and occurrence of (PED)

As regard to **endotracheal tube,** the current study findings showed that approximately half of patients had endotracheal tube size seven, and more than half of patients were intubated from seventy two hours to ten days. **This result may be attributable to** that the most common diagnosis in this study was neurovascular disorders e.g head and spinal trauma which led to prolonged intubation. **This result was in the same line with (Dylczyk-Sommer, 2020)** who found more than half of patients were intubated for more than seventy two hours and agreed with a study done by**(El Gharib et al., 2019)** who found most of patients were intubated more than seventy two hours. **On the other hand this result** disagreed with **(Tsai et al., 2016)** who found that most of patients were intubated more than ten days and had endotracheal tube size seven and a half. Also disagreed with **(Abdalla et al., 2019)** who found above the half of patients had endotracheal tube size seven and a half.

Also, there was **no statistical significance difference** between occurrence of post-extubation dysphagia (PED) and endotracheal tube size. This result was consistent with **(Tsai et al., 2016)** who

found in his study that there were **no statistically significance difference** between the occurrence of post-extubating dysphagia and size of the endotracheal tube. On the opposite side this result disagreed with **(Zeng et al., 2021)** who reported that there was **statistically significance difference** between occurrence of PED and size of of endotracheal tube. In addition to there was a **statistically significance difference** between occurrence of PED and duration of endotracheal tube intubation. **This may be because** the laryngeal nerve is compressed by the tracheal tube, which directly injures the healthy anatomical components and impairs swallowing. This result was in the same line with **(Omura et al., 2019)** who found that there was **statistically significance difference** between occurrence of PED and duration of intubation . On the contrary this result disagreed with **(McIntyre et al., 2020)** who demonstrated that there was **no statistically significance difference** between occurrence of PED and duration of intubation . In the present study it was found that nearly half of patients had gastric tube size sixteen French and stayed less than ten days respectively. This result was in line with the findings of the study done by **(Abdalla et al., 2019)**, in which they noted that the majority of patients had gastric tubes with a length of less than ten days in more than half of the patients. On the contrary this finding disagreed with **(Zhou et al., 2019)** who documented that half of patients stayed more than ten days and most of studied patients had gastric tube sized eighteen French .

Also, this study revealed that there was **statistically significance difference** between occurrence of (PED) and size of gastric tube. This **has to** do with the fact that the gastric tube, a foreign item that travels with the food as it passes through the pharynx and esophagus before reaching the stomach, directly affects the muscles that control swallowing, especially when its diameter increases. It leads to pharyngeal mucosa damage and occurrence of dysphagia. This result was compatible with **(Zhou et al., 2019)** who showed that there was **statistically significance difference** between the occurrence of PED and size of gastric tube . additionally this result disagreed with **(Wu et al., 2019)** who found that there was **no statistically significance difference** between occurrence of dysphagia and presence or absence of either a small-bore or large-bore gastric tube. Additionally, it was found that there was **statistically significance difference** between occurrence of PED and duration of gastric tube intubation. This result went in the same line with **(Dylczyk-Sommer, 2020)**study who found that there was **statistically significance difference** between Gastric tube period and occurrence of post - extubating dysphagia. **On the contrary** this result was disagree with **(Fattal et al., 2016)**who found that there was **no statistically significance difference** between swallowing problem and the duration of gastric tube and occurrence of PED.

Conclusions

- The highest percentages of studied patients were suffering from moderate dysphagia.
- There were many variables that could cause post-extubation dysphasia during stay in an intensive care unit for the studied patients. These variables include therapeutic-related variables, as duration of end tracheal tube, duration, and size of gastric tube. Additionally, among the critically ill patients who have just been extubated, nurses should detect and manage dysphagia early.
- Post-extubation dysphagia has been linked to the patient adverse outcomes, such as an increased chance of reintubation, pneumonia development, prolonged hospitalization, discharge to home with higher risk of mortality.

Recommendations

- In order to predict and treat post-extubation dysphasia as quickly as feasible, nurses should periodically check on the critically ill patients who have been intubated.
- Ongoing in-service training sessions for CCNs in ICUs should be held in accordance to the significance use of the Gugging assessment tool to evaluate PED.
- Restoring proper swallowing reflexes and focusing on the rehabilitation are the major components of PED management. No pharmaceutical therapy was used up till this point, to successful conserving PED demonstration. In order to guarantee patient safety and minimize negative effects for both the patient and the healthcare organization, it is crucial to identify and manage PED patients early.

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