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KNOWLEDGE, ATTITUDE AND PRACTICE OF ICU NURSES REGARDING POST-EXTUBATION DYSPHAGIA IN TRACHEAL INTUBATION PATIENTS

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Abstract

Background

Post-extubation dysphagia (PED) is a common complication among critically ill patients following tracheal intubation and mechanical ventilation. Impaired swallowing may increase the risk of aspiration, aspiration pneumonia, inadequate nutrition, and prolonged hospitalization. ICU nurses play an important role in early recognition, prevention, and management of PED. Adequate knowledge, positive attitudes, and appropriate practices are essential for safe post-extubation care.

Aim

To assess the knowledge, attitude, and practice of ICU nurses regarding post-extubation dysphagia in tracheally intubated patients at Jinnah Hospital, Lahore.

Methods

A quantitative, descriptive cross-sectional design was used. The study was conducted at Jinnah Hospital, Lahore. The accessible population consisted of 600 ICU nurses. A sample of 235 nurses was selected using convenience sampling. Data were collected through a structured self-administered questionnaire assessing demographic characteristics, knowledge, attitude, and practice regarding PED. Data were analyzed using SPSS version 27 through descriptive statistics.

Results

The findings showed that 50.6% of nurses had moderate knowledge, 28.9% had good knowledge, and 20.4% had poor knowledge. Regarding attitude, 71.1% demonstrated a positive attitude, 20.0% had a neutral attitude, and 8.9% had a negative attitude. Regarding practice, 48.9% demonstrated moderate practice, 28.1% good practice, and 23.0% poor practice.

Conclusion

ICU nurses demonstrated moderate knowledge and practice with predominantly positive attitudes regarding PED. Regular training and standardized screening protocols are recommended.

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INTRODUCTION

Knowledge refers to the information and understanding possessed by ICU nurses regarding post-extubation dysphagia (PED), including its causes, risk factors, clinical manifestations, complications, screening methods, and appropriate nursing management. Attitude refers to nurses' perceptions, beliefs, professional responsibility, and willingness to recognize, assess, prevent, and manage swallowing difficulties following removal of an endotracheal tube. Practice refers to the actual clinical actions performed by ICU nurses, including identification of patients at risk, post-extubation swallowing assessment, appropriate positioning, monitoring for aspiration, withholding oral intake when indicated, referral to relevant specialists, and implementation of prescribed dysphagia-management strategies. (Yu et al., 2024).

Post-extubation dysphagia is a swallowing disorder that develops after removal of an endotracheal tube and may result from structural injury, impaired sensory function, neuromuscular weakness, reduced laryngeal sensation, impaired airway protection, and critical-illness-related physiological changes. Tracheal intubation is an essential life-saving intervention for critically ill patients requiring mechanical ventilation, but prolonged or traumatic intubation can interfere with normal swallowing mechanisms. PED can result in aspiration, aspiration pneumonia, malnutrition, prolonged hospitalization, increased healthcare utilization, reduced quality of life, and increased morbidity and mortality. The condition therefore represents an important patient-safety concern in intensive care nursing and requires early recognition and appropriate management by trained ICU nurses (Bertschi et al., 2025).

Post-extubation dysphagia is a growing issue among critically ill patients who receive endotracheal intubation and mechanical ventilation. There is recent disparate data regarding the prevalence of PED largely due to disparate population sampling, assessment timing, duration of intubation, and screening tactics. Yu et al. (2024) conducted a systematic review and meta-analysis of 30 studies and found that the average incidence of PED was 36%, with a positive time dependent association in incident cases following extubation. Other systematic studies showed that roughly 41% of critically ill adults develop dysphagia after extubation, and many of them develop a dangerous and concealed condition known as silent aspiration. This data confirms that post-extubation dysphagia is an unfortunately common result of critical care, however, without a systems-based approach, it can remain an invisible critical issue (McIntyre et al., 2021; Yu et al., 2024).

According to Bertschi et al (2025), about one out of every five patients admitted unexpectedly to mixed medical-surgical ICUs will develop PED (Pons et al, 2016; Pons et al, 2019). The authors underscore the implications of PED. PED increases the risk and severity of ICU stays, prolongs hospital stays, increases resource consumption, negatively impacts quality of life, and contributes to increased morbidity and mortality (Pons et al, 2016; Pons et al, 2019). In addition, PED has been shown to be an independent predictor of post-critical illness mortality (Alberti et al, 2021). While PED is an important contributor to post-extubation safety, routine screening is still not consistently employed in many ICUs (Bertschi et al, 2025).

The development of PED is attributed to numerous patient and treatment-related factors. Hou et al (2023), in their systematic review and meta-analysis involving 15 studies, assessed PED risk factors. Older age, prolonged intubation, high APACHE II scores, and presence of a tracheostomy were reported as risk factors for PED. McIntyre et al (2022), in their systematic review and meta-analysis involving 25 studies, also assessed a broad range of risk factors and reported that intubation length was a consistently reported risk factor for PED. Thus, PED is an issue of concern for ICU nurses post-extubation. The risk factors facilitate identification of patients who are at high risk of developing PED (Hou et al, 2023; McIntyre et al, 2022).

Zürcher et al. (2020) analyzed data from 933 medical surgical ICU patients and found that preexisting neurological conditions, emergency ICU admissions, prolonged mechanical ventilation, renal replacement therapy, and

Frontier in Medical & Health Research

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disease severity independently predicted dysphagia after extubation. The study demonstrated the utility of systematic bedside screening post-extubation. The authors showed that dysphagia can be identified through structured assessments and can no longer be solely reliant on clinical impressions. The results from the study are relevant to nursing practice as nurses working in the ICU are among the first to observe patients and typically the first to identify a change in swallowing, voice, cough, secretion management and airway protection post-extubation.

The timing of the assessment is another crucial aspect of the management of PED. Luo et al. (2024) conducted a prospective descriptive study of 173 ICU adult patients and assessed swallowing function at 1, 4, and 24 hours after extubation using the Gugging Swallowing Screens. Dysphagia was present in 86.71% at the first hour, 63.01% at the 4th hour, and 43.35% at the 24th hour after extubation. The significant differences in swallowing dysphagia at the different time assessments demonstrate the dynamism of the recovery process of the swallowing function. ICU nurses should have the ability to assess patients in relation to oral feeding prior to the initiation of enteral nutrition (Luo et al., 2024).

Beyond a short-term inability to swallow, PED has long term consequences. Swan et al. (2022) studied 822 patient episodes and noted that individuals with PED spent more time in the ICU and were more likely to develop pneumonia than people with dysphagia. With a median time of 5 days for patients in the PED group compared to the 3 days for patients in the non-PED group for ICU stays, it is clear that pneumonia became a problem for patients in the PED group. As for financial impact, the PED group tended to cost more. From a financial standpoint, dysphagia should be recognized and steps to resolve the situation need to be taken to avoid impacting recovery for patients and the finite resources of the healthcare system (Swan et al., 2022).

Swan et al. (2022) also noted that PED negatively impacts recovery for patients. This idea has also been explored in relation to physical function. In 2022, another study was focused on the connection between PED and the physical function of survivors of critical illness. Impaired swallowing interferes with a person's ability to nutrition, recover physically, and decreases the quality of their life. Therefore, swallowing dysphagia requires the early recognition of a multidisciplinary health care team (Clinical Nutrition ESPEN, 2022).

Routine screening of PEDs is a crucial aspect of their management. Troll et al. (2023) studied the Gugging Swallowing Screen and determined the importance of a structured bedside swallowing screen for PED identification in ICU patients. Healthcare staff members are able to identify those under their care who need additional screening, and standardized tools help reduce the reliance on clinical judgment which is often subjective. The responsibility of identifying such patients falls on nurses as they provide round-the-clock care and bedside support, take note of the patient's response to oral intake, manage secretions and coughs, and report any variations to the doctor and the speech and language therapist. Routine screening and prompt referrals hinge on the knowledge of the nurse (Troll et al., 2023).

The inconsistency in nursing practices relating to PED persists across the critical care unit. Nielsen et al. (2024) reported in a national survey of Danish ICUs that only half of the ICUs had a PED policy, and even fewer of them screened patients after extubation. The survey found insufficient staff, insufficient recognition of dysphagia, and the absence of standardized policies to be major limitations. The absence of standardized best practices dictated from evidence does not guarantee that nursing staff will carry out their practices appropriately. Nurses need institutional policies, screening tools, and standardized strategies, coupled with multidisciplinary and organizational support (Nielsen et al., 2024).

Higher priority is increasingly being placed on the role of nurses in PED screening. Nielsen et al. (2025), conducted a nurse-led implementation study on systematic dysphagia screening in the ICU, using education, e-learning, bedside peer support, feedback, and environmental cues. The study illustrated that screening for early detection of PED can be a component of nurse-led

Frontier in Medical & Health Research

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screening. Evidence such as this illustrates that the assessment of ICU nurses should extend beyond their basics of knowledge; rather it should focus on their attitude and behavior in relation to PED. This is important since it may not always be the case that knowledge can be automatically linked to a consistent clinical behavior (Nielsen et al., 2025). The multidisciplinary nature of PED management is evident. In 2024, a multinational expert group published their opinion on screening, assessment, and management of dysphagia in ICU patients. The authors stated the importance of trained nurses, physicians, speech-language pathologists, and the rest of the multidisciplinary team. The suggested management may include screening after extubation,S a specialist assessment, positioning, modification of food and fluids, compensation, nutritional management, and swallowing therapy. This emphasizes that ICU nurses must also possess knowledge and a positive attitude in order to manage dysphagia (Steidl et al., 2024).

Chen et al. (2024) discuss how dysphagia interventions improve certain patient outcomes. In their meta-study which comprised 10 studies and 1,031 participants, swallowing interventions resulted in reductions of dysphagia severity and reduced time before the resumption of eating/drinking via the mouth, and enhanced the quality of life. The interventions analyzed showed decreased risk of aspiration pneumonia, but the authors warned of the existing evidence's gaps and the need for more quality studies. Identifying patients who are at risk is shown to be vital. Before complications occur, patients who are at risk may be evaluated and receive the necessary interventions and assessments. (Chen et al., 2024)

In the last few years, the area of research focused on the knowledge, attitudes, and practices of ICU nurses, has emerged. Sun et al. (2024) studied 627 ICU nurses to assess their knowledge, attitudes, and practices related to PED among patients who are intubated and mechanically ventilated. For knowledge, the attitude and practice sections, the average scores were 6.46 ± 3.09, 7.53 ± 1.69 and 4.89 ± 2.00, respectively, and the overall KAP score was 18.88 ± 5.18. The authors concluded that the knowledge, attitudes, and practices of ICU nurses regarding PED were at a moderate-to-low level. Some of the factors that were analyzed and were associated with the dimensions of KAP, included age, nationality, professional title, job satisfaction, work section and employment status. The authors suggest that insufficient knowledge of nurses and an unpracticed attitude may play an important role in effective PED. (Sun et al., 2024)

Additional findings were reported by Zheng et al. (2025) in a multicentre cross-sectional survey of 510 ICU nurses in 25 hospitals across China. Knowledge, Attitude, and Practice scores were found to be 8, 8 and 4.9 respectively, on the median. Knowledge was observed to be slightly better among nurses with higher educational and ICU experience. Attitude and Practice scores were observed to be significantly influenced by PED training. The study noted mild connection between Knowledge and Attitude, suggesting that there may be a need to enhance the clinical practice of a nurse beyond increasing their Knowledge. The study suggests enhanced professional development which integrates the Knowledge, Attitude, confidence, and practice (Zheng et al., 2025).

The issue was further studied in Pakistan. Sheikh et al. (2024) studied the awareness and attitude of ICU nurses working in Sheikh Zayed Hospital, Rahim Yar kan, towards PED in tracheally intubated patients. The study recorded poor attitudes and knowledge and the need for tailor made professional training and educational programs to enhance nurses' awareness and the management of PED. Pakistan based data is particularly significant as ICU based resources, staffing, professional training, institutional based services and protocols may differ from the high income countries. This provides an opportunity for local nursing KAP based assessments to provide context specific data for enhancing nursing education and practice (Sheikh et al., 2024).

There is evidence for dysphagia in post-extubated ICU patients from Pakistan that shows the clinical importance of this in this population. Javed et al. (2023) studied dysphagia experienced by post-extubated ICU patients in Lahore and assessed how this was associated with obstructive sleep

Frontier in Medical & Health Research

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apnea and some of the clinical characteristics. PED is found not just within the global critical care community, but also in Pakistan. Nonetheless, in Pakistan, there is very little research that focuses on the comprehensive knowledge, attitudes, and practices of ICU nurses toward PED. This is a highly relevant area of research, as, within the context of Pakistan, they make up the core of the control framework because of their focus on patient safety, the decision to begin oral feeding, and their role of communicating essential information regarding patients to the multi-disciplinary team (Javed et al., 2023).

There is a clear gap between the clinical recognition of PED as an important complication and its routine ICU practice. Several international studies, focusing on the incidence, risk factors, clinically serious consequences, and value of routine screening, have been conducted. Studies of ICU nurses indicate a low level of both knowledge and practice, while other studies in the organizations indicate insufficient protocols, lack of training, and limited specialist support. In Pakistan, the amount of existing evidence is even more limited, and particularly for assessing ICU nurses knowledge, attitudes, and practice combination. Knowledge and attitudes, in this case, are key elements of post-extubation dysphagia management, as they drive screening practice, recognition of aspiration risk, and collaboration among multiple disciplines. Therefore, the measurement of knowledge, attitudes, and practice of ICU nurses regarding post extubation dysphagia of tracheally intubated patients is critical in understanding the educational needs of nurses, enhancing nursing practice, improving patient safety, and establishing standardized screening and management protocols for PED in ICUs.

Methods

A quantitative, descriptive cross-sectional research design was used to assess the knowledge, attitude, and practice of ICU nurses regarding post-extubation dysphagia in tracheally intubated patients. The study was conducted at Jinnah Hospital, Lahore, Pakistan, a tertiary care teaching hospital providing specialized intensive care services to critically ill patients. The study population consisted of 600 ICU nurses involved in direct patient care. The sample size was calculated using the Raosoft sample size calculator at a 95% confidence level, 5% margin of error, and 50% response distribution, resulting in a sample of 235 ICU nurses. A convenience sampling technique was used to recruit participants. Registered nurses working in the ICU, involved in direct patient care, and having experience with mechanically ventilated or tracheally intubated patients were included. Student nurses, nursing interns, administrative nurses, nurses on extended leave, and nurses who were unwilling to participate were excluded. Data were collected using a structured self-administered questionnaire covering demographic characteristics and knowledge, attitude, and practice regarding post-extubation dysphagia.

DATA COLLECTION PROCEDURE

Before data collection, formal permission was obtained from the relevant authorities of Jinnah Hospital, Lahore. Eligible ICU nurses were approached during the data collection period and were informed about the purpose, objectives, and significance of the study. The researcher explained that participation was voluntary and that participants could withdraw at any stage without any consequences. Written informed consent was obtained from each participant before questionnaire administration. The questionnaires were distributed individually to the eligible nurses in an appropriate setting within the hospital. Participants were given adequate time to complete the questionnaire independently. The researcher remained available to clarify any questions related to the instructions without influencing participants' responses. Completed questionnaires were collected immediately after completion and were checked for completeness. Confidentiality and anonymity were maintained throughout the data collection process, and no personally identifying information was included in the research database.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

DATA ANALYSIS PROCEDURE

The completed questionnaires were coded and entered into **Statistical Package for the Social Sciences (SPSS), version 27** for analysis. Data were checked for completeness, consistency, and accuracy before statistical analysis. Descriptive statistics were used to summarize the characteristics of the participants and the study variables. Frequencies and percentages were calculated for categorical variables, including age categories, gender, educational qualification, ICU experience, and individual questionnaire responses. Means and standard deviations were calculated for continuous or composite scores where appropriate. Knowledge, attitude, and practice scores were categorized according to the predetermined scoring criteria of the questionnaire. The findings were presented in organized tables and figures to facilitate interpretation and comparison. The results were interpreted according to the study objective of assessing the knowledge, attitude, and practice of ICU nurses regarding post-extubation dysphagia.

Results

Demographic Analysis

Table 1: Demographic Characteristics of ICU Nurses (n=235)

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age (years)	20–25	71	30.2
	26–30	83	35.3
	31–35	48	20.4
	>35	33	14.0
Gender	Male	82	34.9
	Female	153	65.1
Educational Qualification	Diploma in Nursing	54	23.0
	Generic BSN	128	54.5
	Post RN BSN	39	16.6
	MSN/Other	14	6.0
ICU Experience	<1 year	39	16.6
	1–5 years	106	45.1
	6–10 years	57	24.3
	>10 years	33	14.0
Total		**235**	**100.0**

Table 1 showed that the largest proportion of ICU nurses were aged 26–30 years (35.3%), followed by those aged 20–25 years (30.2%). Most participants were female (65.1%). Regarding educational qualification, more than half of the participants had a Generic BSN degree (54.5%). In terms of ICU experience, 45.1% had 1–5 years of experience.

Table 2: Knowledge of ICU Nurses Regarding Post-Extubation Dysphagia (n=235)

Knowledge Item	Correct Answer n (%)	Incorrect Answer n (%)
Knowledge of the definition of post-extubation dysphagia	181 (77.0)	54 (23.0)
Knowledge of major risk factors	169 (71.9)	66 (28.1)
Knowledge of prolonged tracheal intubation as a risk factor	192 (81.7)	43 (18.3)
Knowledge of signs and symptoms	158 (67.2)	77 (32.8)

Frontier in Medical & Health Research

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Knowledge of aspiration risk	185 (78.7)	50 (21.3)
Knowledge of aspiration pneumonia	174 (74.0)	61 (26.0)
Knowledge of appropriate swallowing screening	143 (60.9)	92 (39.1)
Knowledge of post-extubation feeding precautions	151 (64.3)	84 (35.7)
Knowledge of appropriate patient positioning	196 (83.4)	39 (16.6)
Knowledge of referral for further swallowing assessment	147 (62.6)	88 (37.4)

Interpretation:

Table 2 demonstrated that the highest proportion of correct responses was related to appropriate patient positioning (83.4%), followed by prolonged tracheal intubation as a risk factor (81.7%). The lowest proportion of correct responses was observed for appropriate swallowing screening (60.9%), followed by referral for further swallowing assessment (62.6%).

Table 3: Attitude of ICU Nurses Regarding Post-Extubation Dysphagia (n=235)

Attitude Statement	Agree n (%)	Neutral n (%)	Disagree n (%)
PED screening is an important part of post-extubation care	198 (84.3)	25 (10.6)	12 (5.1)
ICU nurses should routinely assess patients for swallowing difficulties	190 (80.9)	29 (12.3)	16 (6.8)
Nurses should identify patients at high risk of PED	201 (85.5)	22 (9.4)	12 (5.1)
PED can increase the risk of aspiration	205 (87.2)	19 (8.1)	11 (4.7)
Nurses should receive training regarding PED	211 (89.8)	16 (6.8)	8 (3.4)
Standardized PED screening protocols should be available in ICUs	216 (91.9)	12 (5.1)	7 (3.0)
Patients should be monitored carefully before oral feeding after extubation	209 (88.9)	18 (7.7)	8 (3.4)
Nurses have an important role in preventing aspiration	213 (90.6)	15 (6.4)	7 (3.0)
Multidisciplinary management is important for PED	204 (86.8)	22 (9.4)	9 (3.8)
Early recognition of PED can improve patient safety	218 (92.8)	11 (4.7)	6 (2.6)

Table 3 showed generally positive attitudes among ICU nurses regarding post-extubation dysphagia. The highest proportion of agreement was reported for the statement that early recognition of PED could improve patient safety (92.8%), followed by the importance of standardized PED screening protocols (91.9%). The lowest agreement was observed for routine assessment of swallowing difficulties (80.9%), although this still represented a substantial majority of participants.

Table 4: Practice of ICU Nurses Regarding Post-Extubation Dysphagia (n=235)

Practice Item	Always n (%)	Sometimes n (%)	Never n (%)
Assess patients for swallowing problems after extubation	101 (43.0)	89 (37.9)	45 (19.1)
Monitor for coughing during oral intake	128 (54.5)	79 (33.6)	28 (11.9)
Monitor for choking after extubation	135 (57.4)	76 (32.3)	24 (10.2)
Observe voice changes after swallowing	91 (38.7)	96 (40.9)	48 (20.4)
Maintain appropriate patient positioning during feeding	157 (66.8)	59 (25.1)	19 (8.1)
Apply aspiration precautions when indicated	148 (63.0)	67 (28.5)	20 (8.5)
Monitor oxygen saturation during suspected aspiration	142 (60.4)	71 (30.2)	22 (9.4)

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Withhold oral intake when swallowing impairment is suspected	116 (49.4)	82 (34.9)	37 (15.7)
Document swallowing-related observations	98 (41.7)	93 (39.6)	44 (18.7)
Refer patients for further swallowing assessment when required	87 (37.0)	103 (43.8)	45 (19.1)

Interpretation:

Table 4 indicated that the most frequently performed practice was maintaining appropriate patient positioning during feeding (66.8%), followed by applying aspiration precautions when indicated (63.0%). Referral for further swallowing assessment was performed consistently by 37.0% of nurses, while 43.8% reported performing this practice sometimes. Assessment of swallowing problems after extubation was always performed by 43.0% of participants.

Discussion

The current study investigated ICU nurses' knowledge, attitudes, and practices towards post-extubation dysphagia for patients with tracheal tubes. The demographics revealed that most participants were between the ages of 26 and 30 (35.3%) while 30.2% were in the 20 to 25 age range, and only 14.0% were over 35. The majority of the sample (65.1%) was female. The largest percentage of participants (54.5%) held a Generic BSN, and 45.1% had between 1 and 5 years of ICU experience. This profile suggests that study participants were mainly young, nurses with undergraduate nursing education and having limited to moderate experience in the ICU. According to Zheng et al. (2025), education and experience in the ICU had a significant effect on the knowledge nurses had on post-extubation dysphagia, whereby nurses with a bachelor's degree or higher had an understanding of post-extubation dysphagia compared to those with less education. The demographic information of this study is critical to understand the knowledge and practice gaps that were on this study.

This study showed that fifty point six percent of ICU nurses were found to have a moderate level of knowledge regarding post-extubation dysphagia (PED); twenty eight point nine percent showed good knowledge; and twenty point four percent showed poor knowledge. The study indicated that although most nurses had some level of knowledge regarding PED, many nurses lacked adequate knowledge to ensure effective clinical management. For example, Sun et al. (2024), in their cross-sectional study of six hundred twenty seven ICU nurses, found an average knowledge score of six point four six, an attitude score of seven point five three, and a score of four point eight nine for practice, and reported that overall their knowledge, attitude, and practice (KAP) level was found to be moderate to low. Similar to the existing literature, the study found that ICU nurses had an inadequate level of knowledge regarding PED, even though they routinely cared for intubated patients.

Most nurses knew about the appropriate positioning of patients (83.4%) and the risks of aspiration (78.7%), as well as prolonged intubation (81.7%) but had an inadequate level of knowledge about swallowing (60.9%) and the need to refer for an assessment (62.6%) and about feeding guidelines (64.3%) after extubation. It showed that the nurses had a better understanding of general clinical risks than assessment and referral. Troll et al. (2023) showed that bedside swallowing screening in the ICU is essential for the diagnosis of PED and that nurses should have a working knowledge of assessment. The lack of knowledge about swallowing screening in the current study may be due to a lack of exposure to the assessment of PED within the ICU.

This study showed generally positive perceptions of post-extubation dysphagia, with 71.1% of ICU nurses exhibiting positive perceptions, 20.0% neutral, and 8.9% negative. Responses that post-extubation dysphagia recognition has the potential to enhance patient safety garnered 92.8% agreement. The need for post-extubation dysphagia screening within the ICU was supported by 91.9%, and the nurses' role in avoidance of aspiration by 90.6%. Sun et al. (2024) found a similar attitude of ICU nurses in

Frontier in Medical & Health Research

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relation to the Knowledge and Practice dimensions, with the Practice dimension scoring 4.89 ± 2.00 versus the attitude dimension scoring 7.53 ± 1.69. This comparison shows that ICU nurses understand the clinical significance of post-extubation dysphagia, despite the lack of Knowledge and Practice.

The current study indicates a clear understanding on the need for training and the development of standardized protocols. The majority of nurses expressed the need for ICU nurses to be trained in PED, with 89.8% in favor, and for PED screening protocols, with 91.9% in favor. The participants showed the need for both administrative and academic support for safe dysphagia management. Zheng et al. (2025) stated that supportive PED training and the support of other components positively influenced nurses' views and the performance of their duties. It was also reported that the improvement of the knowledge, views, and performance was not synergistic. The authors were in support of the need for other components and supportive systems beyond training. The current study showed a strong positive view, which was reported to be greater than the knowledge and performance gap.

The current study showed that 48.9% of ICU nurses had a moderate level of practice, 28.1% had good practice, and 23.0% had poor practice. The largest segment of the study showed a high level of practice for the maintenance of safe feeding positions (66.8%), followed by the practice of aspiration precautions (63.0%) and the monitoring of oxygen saturation with a suspected aspiration (60.4%). Only 37.0% of the participants consistently practiced referral for a further assessment of swallowing. Zheng et al. (2025) reported a median practice score of 4.9 in their study of 510 ICU nurses, which indicated a low level of practice, but a fair level of knowledge and view. The current study results showed a similar view on the lack of practice.

The present study found a concerningly low frequency of routine swallowing assessments. Only 43.0% of ICU nurses reported assessing patients for swallowing difficulties after extubation as part of their routine. While 37.9% reported doing this occasionally, 19.1% stated that they never did this. Assessing voice changes after swallowing was reported as part of their routine by only 38.7% of nurses. It appears, therefore, that bedside nurses do not routinely identify the signs and symptoms of problematic extubation. It has been shown that, following extubation, swallowing difficulties are present in a significant number of critically ill patients. McIntyre et al. (2021) report that patients with critical illness display problematic extubation on a regular basis. At this stage, it can be argued that there is a significant practice gap for the routine assessment of swallowing difficulties in critically ill patients in the ICU.

The findings related to referral practices revealed a significant clinical gap. Swallowing assessments were referred to 'always' by only 37.0% of nurses, 'sometimes' by 43.8% and 'never' by 19.1%. Possible explanations could be unclear referral guidelines, lack of speech and swallowing therapists, no formal disintuitive pathways or a lack of understanding of formal dysphagia assessments. Nielsen et al. (2024) found high variability of post-extubation dysphagia management across intensive care units and noted inconsistent screening and a lack of organizational support as key obstacles. Findings of this study likely support this evidence and indicated that positive attitudes toward PED were not aligned to the same level of clinical practice.

Supporting evidence to the findings is available from the Pakistani context. Sheikh et al. (2024) conducted a cross-sectional study among ICU nurses at Sheikh Zayed Hospital, Rahim Yar Khan, which revealed the importance of nurses' awareness and attitudes for the early detection and management of PED in intubated patients. The study reported that PED was a common but under recognized condition, stressed the need for more professional education, and similarly showed the gap of positive attitude in the Pakistani setting. The study showed moderate knowledge and practice among nurses of Jinnah Hospital, Lahore, indicating that PED focused education and clinical guidelines are needed in Pakistani ICUs.

The findings of the current study showed that ICU nurses had a moderate level of knowledge and practice regarding post-extubation dysphagia

Frontier in Medical & Health Research

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and an overall positive attitude in this regard. Overall findings were similar to those of Sun et al. (2024) and Zheng et al. (2025), with the latter two also showing that KAP related to PED among ICU nurses was similarly lacking. This study provides initial evidence from Jinnah Hospital in Lahore, Pakistan, and showed that nurses were aware of PED and dysphagia, but there was a lack of systematic screening, documentation, and referrals. It was shown that there is a need for continuous in-service education and training and for screening, a clear referral and a multidisciplinary team (MDT) approach involving ICU nurses, doctors, speech and language therapists, and dietitians. Zheng et al. (2025) concluded that the provision of knowledge alone does not lead to improvement in other areas of KAP. Improving PED-related care and reducing the risk of aspiration among intubated patients may be best accomplished through a combination of nurse education and improvement of the hospital's support systems.

CONCLUSION:

This study suggested that ICU nurses at Jinnah Hospital, Lahore, had a moderate level of knowledge and practice of post-extubation dysphagia as well as a predominantly positive attitude. Knowledge gaps were noted in the systematic screening, swallowing, and feeding precautions, and in the referral for an assessment for further interventions for dysphagia. Nurses recognized the importance of an early identification, regular screening, aspiration prevention and the importance of a professional training. The gap between having positive attitudes and moderate knowledge and practice suggests that just having the awareness of an issue may not lead to the provision of optimal research-based care without the proper planning and implementation. Regularly scheduled training along with multidisciplinary team work and improved referral pathways were all suggested to help improve the quality and the safety of care for patients post-extubation.

RECOMMENDATIONS OF THE STUDY:

1. Regular in-service training: All ICU nurses should have access to continuing education and ongoing competency training to develop their skills and knowledge to improve care, including post-extubation dysphagia. Training should include the dysphagia risk factors, signs, and symptoms; dysphagia screening; and preventions for aspiration and dysphagia and their management.
3. Standardized screening: A standardized post-extubation dysphagia screening should be implemented by Jinnah Hospital to be completed for all critically ill patients prior to initiating any oral feeding.
4. Validated screening tools: Bedside swallowing screening to assist in the identification of risk for dysphagia should be a routine nursing practice in all ICU's
5. Nursing guidelines: Evidence based nursing guidelines should be developed to direct nursing care for dysphagia patients regarding positioning, feeding, aspiration precautions, observation, documentation and referral for further evaluation and/or interventions.
6. RN collaboration: ICU nurses should engage in a collaborative process with physicians, speech-language pathologists, dietitians, and other involved health professionals in the comprehensive assessment and management of patients exhibiting suspected post-extubation dysphagia.
7. Continuing education: Given the majority of nurses' lack of knowledge regarding the process of assessing swallowing functions and prevention of aspiration, their continuing education should focus on this specific subject.
8. Future studies: Similar research projects need to be conducted in public and private hospitals in Lahore and other areas in Pakistan. More generalizable research can be obtained by increasing the sample size.
9. Future research: Other researchers should conduct studies in the quasi-experimental and randomized control group designs to understand the influence of post-extubation dysphagia on nurses' knowledge, practices, and attitudes.

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