

Nurses Performance Regarding Feeding for Patient with Stroke Associated Pneumonia

⁽¹⁾ Asmaa Mohamed Ahmed, Clinical Instructor in Medical Surgical Nursing, Faculty of Nursing, Zagazig University.

⁽²⁾ Nadia Mohamed Taha, Professor of Medical Surgical Nursing, Faculty of Nursing, Zagazig University.

⁽³⁾ Howida Kameel Zytoon, Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Zagazig University.

⁽⁴⁾ Mona Abdullah Mohammed. Assistant Professor of Medical Surgical Nursing, Faculty of Nursing, Zagazig University

Email: asmaaabdelmaksoud121@gmail.com

Background: SAP requires nursing care intervention that focus on close monitoring and active therapeutic intervention. Therefore, the nursing care should focus on monitoring of the respiratory status, maintaining patent airway, provide adequate feeding strategies, and oral care. **The study aimed** to evaluate nurses performance regarding feeding for patient with stroke associated pneumonia. **Research design:** A descriptive design was used. **Setting:** The present study was conducted in stroke ICU at internal medical hospital with agar at Zagazig university hospitals, Zagazig Governate, Egypt. **Tool of data collection:** Two tools were used for collecting data: Self-administered questionnaires for nurses about demographic data, and nurses' knowledge. Observational checklist to assess level of nurses' practices. **Study subjects:** A convenience sample of all available nurses (40). **Results:** Nearly two thirds (62.5) of studied nurses their age between 25-30 years. Regarding nurses' qualification (72.5%) of nurses had technical institute, (85%) of studied nurses' had unsatisfactory total level knowledge. (80%) of studied nurses' had unsatisfactory total level of practice **Conclusion:** Majority of studied nurse had unsatisfactory performance regarding feeding for patient with stroke associated pneumonia. **Recommendation:** Training programs are recommended to improve nurses performance regarding feeding for patient with stroke associated pneumonia.

Key words: Feeding, Nurses Performance, and SAP

TobRegul Sci.™ 2023; 9(1): 8248 - 8266

DOI: doi.org/10.18001/TRS.9.1.583

Introduction:

Stroke is a widely prevalent disorder causing significant morbidity and mortality. In our country, it usually occurs in epidemic proportions. The stroke considered second leading cause of mortality throughout the world. Different types of medical complications occur during hospitalization of stroke patients. These medical complications lead to prolonged hospital stay, increased cost of care, and high morbidity and mortality in post stroke patients. The various medical complications in post stroke patients are infections mainly pneumonia, urinary tract

infections, cardiac dysfunction, dysphagia, deep venous thrombosis, pulmonary embolism, bedsores, falls, and post stroke depression (Das, 2019).

Pulmonary infections frequently occur among stroke patients and adversely affect clinical outcomes, aggravating the financial burden on family and national medical health systems. SAP refers to pulmonary infections that develop within the first 7 days of stroke onset among non-ventilated patients. SAP one of the most common in-hospital medical complications after stroke. Pneumonia is a key risk factor for stroke death. Female sex, advanced age, dysphagia, the severity of acute stroke and disturbance of consciousness are the main risk factors for SAP. The combination of aspiration caused by these risk factors and acute stroke induced immunosuppression leads to the increased incidence of SAP (Liu, *et al.*, 2022).

SAP requires nursing care intervention that focus on close monitoring and active therapeutic intervention. Therefore, the nursing care should focus on monitoring of the respiratory status, providing adequate rest, maintaining patent airway, ease respiratory efforts, controlling fever, prevent dehydration, provide adequate feeding strategies, oral care, administer medication, perform chest physiotherapy, provide oxygenation, assist in diagnostic measures, and ensuring psychological support for parents then preventing complications (Zain ELdin, *et al.*, 2018).

The management of dysphagia at patient with SAP involves several medical specialties. It is vital to coordinate management among various experts, including dietitians, nurses, physicians, occupational therapists, speech, and language pathologists. Nurses have a crucial role in the dysphagia multidisciplinary team since they are the first healthcare professionals to notice the symptoms and indicators of the condition and apply adequate feeding strategies. Feeding strategies included, dysphagia screening within 24 hours of patient admission, appropriate feeding method according to patient condition and hydration status assessment, and correcting nutritional deficiencies. Adjusting fluid and food consistency, postural strategies, swallowing exercises, and stimulating oral care (Yousef *et al.*, 2020).

Significance of the study:

SAP affecting 5 to 44% of non-ventilated stroke patients, which increases the risk of mortality and considered one of the main causes of death in the first few days and weeks after stroke therefore, early identification and management of high-risk patients are necessary to reduce the incidence of SAP (Liu, *et al.*, 2022). SAP also associated with worse functional outcomes, longer length of stay and increased healthcare costs (Bray, *et al.*, 2018).

The incidences of hospital admission for patients with SAP on stroke intensive care units' "ICUs" at Zagazig University hospitals, through (2023) were 395 patients (Statistical Records of stroke ICUs at Zagazig university Hospitals, 2023). SAP is a common complication after stroke, with a reported incidence of 12.4% to 47%. SAP can worsen stroke outcomes, increase the occurrence of severe disabilities, and even cause death (Li, *et al.*, 2022).

Nurses have a crucial role in the dysphagia multidisciplinary team since they are the first healthcare professionals to notice the symptoms and indicators of the condition and apply adequate feeding strategies. Feeding strategies included, dysphagia screening within 24 hours of

patient admission, appropriate feeding method according to patient condition and hydration status assessment, and correcting nutritional deficiencies. Adjusting fluid and food consistency, postural strategies, swallowing exercises, and stimulating oral care (Yousef *et al.*, 2020). Preventing and managing complications post stroke mainly SAP is a key element of nursing care and has the potential to significantly reduce incidence of mortality, length of stay and cost of hospital admission (Abou Zed & Mohammed, 2019). So, the current study was carried out to evaluate nurses performance regarding feeding for patient with stroke associated pneumonia.

Aim of the study: Was to evaluate nurses performance regarding feeding for patient with stroke associated pneumonia. Through the following objectives:

- Assess nurses' level of knowledge regarding feeding for patient with stroke associated pneumonia.
- Assess nurses' practice regarding feeding for patient with stroke associated pneumonia.

Research Question:

- What is the level of nurses' knowledge regarding feeding for patient with stroke associated pneumonia?
- What is the level of nurses' practice regarding feeding for patient with stroke associated pneumonia?
- Is there is a correlation between nurses' knowledge and their practice.

Research design: A descriptive research design was conducted to achieve the aim of the study.

Setting: The present study was conducted in stroke ICU at internal medical hospital with agar located in second floor consisted of 14 beds at, Zagazig university hospitals, Zagazig Governate, Egypt.

Subjects: A Convenience sample of all available nurses (40) working in the setting mentioned above.

Tools of data collection:

Tool I: Self-administered questionnaire: Composed of two parts:

Part I: Nurse's Demographic data: Which were composed of eight closed ended questions including age, gender, marital status, residence, level of education, years of experience, attendance training courses regarding SAP, and income which adapted from (Amin, *et al.*, 2021).

Part II: Assessment of nurses' knowledge: To assess nurses knowledge regarding feeding for patients with SAP. Total items were 59 included in the list. These items were classified into four different sections which include:

First section (Assessment of nurses' knowledge regarding anatomy and physiology of respiratory system): composed of 10 questions Multiple Choice Questions about (the main function of the

respiratory system, components of the upper respiratory system, components of the lower respiratory system, function of the nose and sinuses, the main function of the epiglottis, description of the pharynx, site of gas exchange, definition of inspiration, the membrane surrounding each lung and normal respiratory rate in an adult) which adapted from (Abdel-Fattah & Mohammed ,2019).

Second section (Assessment the nurses' knowledge regarding SAP): It consisted of 18 Questions in the form of 12 True and False Questions and 6 Multiple Choice Questions which included (definition of SAP, the incidence of SAP, the main cause of SAP, major risk factor for SAP, dysphagia and improper feeding strategies lead SAP, signs and symptoms of SAP, laboratory tests to diagnose SAP, if SAP considered a one of post stroke complication, if SAP increases the risk of death ,complications of SAP, treatment of SAP, prevention of SAP, precautions to reduce the risk of SAP, patient position to improve breathing, purpose of chest physiotherapy, nurse actions before and after suctioning, time for changing the distilled water inside the humidifier, and actions to avoid hypoxia during suction. Which adapted from (Abdel-Fattah & Mohammed ,2019), and modified by researcher to suite aim of the study.

Third section (Assessment nurses knowledge regarding feeding strategies for SAP): It included 20 Multiple Choice Questions which included (assessment swallowing ability to determine appropriate feeding method for patient, nurse actions before performing a swallowing test, indications for gastric tube or parental nutrition, reason for preferring a gastric tube instead of parental nutrition, the method of a gastric tube to reduce aspiration, actions to reduce the incidence of SAP during gastric feeding, nurse actions during gastric feeding to determine completion of the digestion process, disadvantages of parental nutrition, nurse actions during gastric tube or parental nutrition, indications of feeding patient orally, the patient's position after oral or gastric tube feeding , nurse actions when GRV reaching 500, signs and symptoms of dysphagia ,nurse actions for dysphagia signs appear during or after the patient's oral feeding, nursing care for a patient with SAP who suffers from dysphagia, nurse actions when feeding a patient with hypertension, nurse actions when feeding a patient with diabetes mellitus, nurse actions when feeding a patient with heart disease, nurse actions when feeding a patient with liver cirrhosis, and nutrition strategies for patients with dysphagia. Which adapted from (Wirth *et al.*, 2013 and Arsava *et al.*, 2018) and modified by researcher to suite aim of the study.

Fourth section (Assessment of nurses' knowledge regarding oral care): It consisted of 11 Questions in the form of seven True and False Questions and four Multiple Choice Questions which included (definition of oral care ,impact of oral care, risk factor for the growth of bacteria, oral care is swabbing mouth, nurses role during oral care assessment the oral cavity, steps of oral care, oral care considered one of the nursing intervention to prevent SAP, times of oral care equipment needed for oral care, solutions used in oral care, the correct patient position) which adapted from (Dagnew *et al.*, 2020) and modified by researcher to suite aim of the study.

The scoring system

Response score were assigned as the following: Each question was assigned one for each correct answer and zero for incorrect answer. Total score of knowledge was 59 point. Total nurses knowledge equal or above 80 % was considered satisfactory, and unsatisfactory if less than

80% based on statistical analysis.

Tool II: Observational checklists for nurses: It was used to assess level of nurses' practices regarding feeding for SAP. Attenuated observational checklist was adopted by the researcher as guided by (Osawa *et al.*, 2013), (Metwaly *et al.*, 2013), (Lynn, 2016) and (Alexandrou *et al.*, 2020), (Dawn ,2020), and (Dagnewet *al.*,2020). It consists of six parts:

- Swallowing test: which included 5 items
- Residual amount assessment: It included 15 items.
- Nurses' practice before, during and after gastric gavage: It included 29 items.
- Administering medications via a gastric tube: It included 38 items.
- Hydration Status Assessment: It included 27 items.
- Oral care: It included 21 items.

Scoring System:

Each item in each technique was checked as (done) and (not done). These were scored from one and zero respectively, so that a higher score indicate better practice. The total score of all techniques were summed-up and divided by the number of the steps to calculate a mean score. Mean and standard deviation were calculated for nurses in the pre and post program phase. The overall practice score considered satisfactory when total score equal or above 80% and unsatisfactory if it below 80% based on statistical analysis.

Administrative and ethical consideration:

The necessary approvals were obtained from the dean of the Faculty of nursing and submitted to general director of Zagazig University Hospitals. Then Permission to carry out the study was obtained from the head of mentioned setting after explaining the purpose of the study and a verbal consent was obtained from nurses for participation in the study and they were assured that the information would be used for research purposes only. After explaining its purpose, they were given an opportunity to refuse the participation, and they were assured that the information would be used for research purposes only. All ethical issues were taken into consideration during all phases of the study. The ethical research considerations in this study included the following: The research approval was obtained. the objectives and the aims of the study were explained to the participants, Confidentiality and anonymity of the subjects were also assured through coding of all data, and subjects were allowed to choose to participate or not and they had the right to withdraw from the study at any time without penalty. The researcher assured that the data collected will be confidential and would be used only to improve their knowledge and practice for the purpose of the study.

Pilot study:

A pilot study was carried out on four nurses (10%) of the total study sample to test clarity, applicability, relevance and feasibility of the tools and to estimate the required time to fill in each

form. Necessary modification were done according to the pilot study results. Pilot subjects were later excluded from the main study sample.

Field work:

After an official permission was taken from the dean of the faculty of nursing, from the manager of Zagazig University Hospitals and from the head of internal medical hospital with agar, the implementation phase for data collection started as following: The selection of nurses, the collection of data, lasted over a period of 6 months, began from April 2023 to the end of September 2023. The questionnaire was designed by the researcher. Data used was collected where the researcher was available two days weekly from nine am to five pm. According to finding of the pilot study the time was shortage to fill out the interviewing questionnaire so increase to 30-45 min and some questions modified accordingly. Nurses were grouped (eight groups) each group included five nurses. It was necessary for the researcher to introduce herself for the nurses explain the purpose of the study. Meeting the study subjects, each nurse was met individually, got a full explanation about the aim of the study and was invited to participate. The nurse who gave his/her verbal informed consent to participate was handed the interviewing questionnaire and was instructed during the filling.

Content validity& Reliability:

Testing validity: Of the proposed tools by using face and content validity. Face validity aimed at inspecting the items to determine whether the tools measure what supposed to measure. Content validity was conducted to determine whether the content of the tools cover the aim of the study. This stage developed by a jury of five experts, one of them professor in therapeutic nutrition at faculty of medicine, and one of them professor of medical surgical nursing and three assistant professors of medical surgical nursing who reviewed the tool's content for clarity, relevance, comprehensiveness, understanding, and ease for implementation. All recommended modifications were done.

Testing reliability : The reliability of the tools was tested by using the internal consistency method. It was found that Cronbach's alpha reliability coefficient was 0.867 for nurses' knowledge questionnaire (knowledge), and observational checklist (practice) was reliable at 0.932.

Statistical analysis:

The collected data organized, tabulated and statistically analyzed using Statistical Package for Social Science (SPSS) version 25 for windows, running on IBM compatible computer. Descriptive statistics were applied (e.g. frequency, percentages, mean and standard deviation). Test of significance, qualitative variables were compared using Chi square test, quantitative variables were compared using paired t test and independent samples T test. Correlation coefficient test (r) was used to test the correlation between studied variables. Reliability of the study tools was done using Cronbach's Alpha. A significant level value was considered when $p < 0.05$ and a highly significant level value was considered when $p < 0.01$. No statistical significance difference was considered when $p \geq 0.05$.

Results:

Table 1: Illustrates that, nearly two thirds (62.5) of studied nurses their age between 25-30 years old with mean± SD=27.08±4.01 and more than half (55.0%) of studied nurses were females. Nearly three quarters (72.5%) of studied nurses had technical institute. More than half (52.5%) of studied nurses had 1-5 years of experience with mean± SD=5.68 ± 3.24, while nearly, more three quarters (77.5%) of studied nurses hadn't attended training course regarding care of patients with SAP. Three quarters (75%) of studied nurses hadn't enough income.

Table 2: Illustrates that about two thirds (65%) of studied nurses had incorrect answer regarding purpose of performing swallowing test, nurse actions before performing a swallowing test, indications for gastric tube or parental nutrition, and the method of a gastric tube to reduce aspiration

Table 3: The majority (85%) of studied nurses' had unsatisfactory total level knowledge regarding feeding for patient with stroke associated pneumonia.

Table 4: The majority (80%) of studied nurses' had unsatisfactory total level of practice regarding feeding for patient with stroke associated pneumonia.

Table 5: There was highly statistically significant relation between nurses total knowledge and educational level, attendance of training courses, and their income (p= 0.000).

Table 6: Illustrates that, there was highly statistically significant positive correlation between total knowledge and total practice (r= 0.757at p= .000).

Discussion:

Stroke is a cerebrovascular medical emergency characterized by sudden loss of neurological function attributable to a hemorrhage in the brain tissue or an interruption of the blood supply itself. Stroke is a cerebrovascular mainly divided into an ischemic stroke, which occurs due to an embolism or in situ small vessel disease, and hemorrhagic stroke, which aspires due to vascular abnormalities such as hypertension or cerebral amyloid angiopathy (Grossmann, *et al.*, 2021).

Stroke associated pneumonia "SAP" is a common post-stroke complication that generally occurs within seven days of stroke onset in approximately one-third of patients with acute stroke. SAP, being defined as the spectrum of lower respiratory tract infections within the first few days after stroke onset. This infectious complication following stroke which increased risk of mortality within one month, further contributing to the deleterious effects of stroke. One of the main risk factors for SAP is dysphagia, which affects 37–55% of patients after stroke (Assefa, *et al.*, 2022).

Feeding strategies for SAP are maintaining proper feeding techniques as swallowing ability assessment which should be accomplished as soon as possible within the first 24 hours after admission and before oral intake to determine the most appropriate food and fluid textures for provide adequate feeding intake in a safe manner, record intake as soon as possible after feeding patient, measuring residual amount, and assure proper positioning of patient, keeping the upper body securely in an upright position, poor positioning leads to a higher risk for choking or aspirating food or liquid into the lungs. Nurses need to ensure that residents receive the correct

texture food, and observations of coughing or choking. In addition to oral care is very important for enhancing nutrition status for patient and prevent complications (Bell, *et al.*, 2016).

Regarding to demographic characteristic of the studied nurses the result of the present study revealed that two thirds of studied nurses their age between 25-30 years old. This result was in the same line with Weheida *et al.*, (2022) who found in study about "Effect of designed bundle protocol about ventilator associated pneumonia on nurses' performance, compliance, and patient outcomes" that more than two third of studied nurses their age were less than 30 years old.

Also this was supported by Amin *et al.*, (2021) who found in study about "Effect of care bundle strategies on nurses' performance regarding prevention of ventilator associated pneumonia at neonatal intensive care units" that that two thirds of studied nurses their age between 25-30 years old. This contradicted with Castillo, (2021) who reported in thesis entitled "Improving nurses' knowledge of aspiration pneumonia prevention for stroke patients with dysphagia: A quality improvement project " that the majority of studied nurses their age more than 30 years old.

Regarded gender, more than half of studied nurses were females, and two fifths of them were married. This was in agreement with Ebraheim *et al.*, (2024) who found in study about "Effect of competency-based program on nurses' performance and outcomes of patients with post-stroke dysphagia" that, the majority of studied nurses were females ,and three quarters of them were married. Also This finding agreement with Gerida *et al.*, (2022) who stated in a study entitled " Nurses knowledge and performance regarding infection preventive measures for ventilators associated pneumonia" that two thirds of the studied nurses were females, and more than half of them were married.

Regarded level of education, three quarters of studied nurses had technical institute .This finding was in harmony with Castillo, (2021) who reported in thesis entitled "Improving nurses' knowledge of aspiration pneumonia prevention for stroke patients with dysphagia: A quality improvement project " that more than two thirds of studied nurses had technical institute. The present study was not correspondent with Abdel-Fattah & Mohammed, (2019) who reported in study about "Impact of nursing guidelines on nurses' knowledge and performance regarding to prevention of ventilator associated pneumonia in neonates" that approximately two thirds of studied nurses had diploma in nursing. Also this result was disagreement with Kalyan *et al.*, (2020) who found in study about "Knowledge and practices of intensive care unit nurses related to prevention of ventilator associated pneumonia in selected intensive care units of a tertiary care centre, India" that half of the participants, were graduate from bachelor of nursing.

The present study was found that more than half of studied nurses had 1-5 years of experience in stroke ICU. This was in agreement with Weheida *et al.*, (2022) who found in study about "Effect of designed bundle protocol about ventilator associated pneumonia on nurses' performance, compliance, and patient outcomes" that more than half of nurses had between 5-10 years of experience. Also this was in agreement with Amin *et al.*, (2021) who found in study about "Effect of care bundle strategies on nurses' performance regarding

prevention of ventilator associated pneumonia at neonatal intensive care units” that half of studied nurses had between 1-5 years of experience. Controversy, **Aloush, (2018)** who stated in a study entitled " Nurses' implementation of ventilator-associated pneumonia prevention guidelines: an observational study in Jordan” that more than half of studied nurses had more than five years of experience.

The current study findings illustrate that three quarters of studied nurses do not receive any previous training in SAP. This result might be due to a lack of hospital financial resources, shortage of nursing staff, and work overload, which is considered a barrier for attend any training course, and this might be the reason behind their unsatisfactory knowledge, practices before implementation of feeding strategies. In agreement with **Ebraheim et al., (2024)** who found in study about " Effect of competency-based program on nurses' performance and outcomes of patients with post-stroke dysphagia” that the majority of studied nurses had not received previous training for post-stroke dysphagia. Also this was supported by **Abdel-Fattah & Mohammed, (2019)** who reported in study about " Impact of nursing guidelines on nurses' knowledge and performance regarding to prevention of ventilator associated pneumonia in neonates” that nearly two thirds had not attended of previous training programs about prevention of ventilator associated pneumonia “VAP”.

According to nurses' knowledge regarding SAP the present study showed that, the majority of studied nurses had unsatisfactory knowledge regarding SAP. This finding goes in the same line with **Gerida et al., (2022)** who stated in a study entitled " Nurses knowledge and performance regarding infection preventive measures for ventilators associated pneumonia” that the most of studied nurses had unsatisfactory knowledge level regarding VAP.

Regarding total nurses' practice, the majority (85%) of studied nurses' had unsatisfactory total level knowledge regarding feeding for patient with stroke associated pneumonia, this result agree with **Ali, (2013)** who reported in study about " Critical care nurses' knowledge and compliance with ventilator associated pneumonia bundle at Cairo university hospitals” that critical care nurses with different educational levels, irrespective of their years of experience or area of work had unsatisfactory knowledge level regarding VAP. This findings disagreed with **Abdel-Fattah & Mohammed, (2019)** who reported in study about " Impact of nursing guidelines on nurses' knowledge and performance regarding to prevention of ventilator associated pneumonia in neonates” that the most of studied nurses improved in their knowledge immediately after implementation of the program.

Regarding total nurses' practice, there was the majority of studied nurses had unsatisfactory total level of practice regarding feeding for patient with stroke associated pneumonia. This finding in the same line with **Gerida et al., (2022)** who stated in a study entitled " Nurses' knowledge and performance regarding infection preventive measures for ventilators associated pneumonia " that the most of studied nurses had unsatisfactory level of practice regarding VAP .This finding disagreement with **Zhang et al., (2022)** who found in study about ". Implementation strategies to improve evidence-based practice for post-stroke dysphagia identification and management: A before-and-after study " that there was a significant improvement in the nurses' practice of the most studied nurses after implementation of strategies.

There was highly statistically significant relation between nurse's total knowledge and educational level, attendance of training courses, and their income. Likewise, **Mostafa et al., (2019)** who found in study about " Effect of educational program on nurses' knowledge and practice about oxygen therapy " that there was significant relation between total nurses' knowledge and level of education post implementation of the program. Also this result agree with **Al-Waly et al., (2020)** who reported in a study about " Nurses' knowledge regarding pneumonia in children under five years of age at pediatric wards in Kirkuk Teaching Hospitals " that was a significant relation between nurses' knowledge and their age and level of education .

This finding disagreed with **Khalil et al., (2021)** who stated in a study entitled " Impact of educational program regarding ventilator-associated pneumonia bundle on critical care nurses knowledge and practices " that was no significant relationship between total knowledge level and their nurses' qualification at the three study stages.

Regarding correlation between total nurses' knowledge score and total practice score regarding feeding for SAP. There was highly statistically significant positive correlation between total knowledge and total practice. This finding disagreed with **Ebraheim et al., (2024)** who found in study about " Effect of competency-based program on nurses' performance and outcomes of patients with post-stroke dysphagia " that, no statistically significant correlation between the studied nurse's level of knowledge and their level of practice and attitude regarding care of patient with post-stroke dysphagia at pre-program phase. Also this result was disagreement with **Kalyan et al., (2020)** who found in study about " Knowledge and practices of intensive care unit nurses related to prevention of ventilator associated pneumonia in selected intensive care units of a tertiary care centre, India " that no association between nurses knowledge and practices.

Conclusion:

Based on the findings of the present study it can be concluded that, majority of studied nurse had unsatisfactory performance regarding feeding for patient with stroke associated pneumonia. There was highly statistically significant positive correlation between total knowledge and total practice. The present study findings answered all research questions.

Recommendation:

- Continuous feeding strategies programs for nurses caring for patients with SAP to refresh and update their knowledge and practice.
- Standard nursing practices books should be available in the stroke ICU to guide nurses provide appropriate feeding strategies for patient with SAP.
- Ongoing training are recommended for nurses working in stroke ICU on using Gugging Swallowing Screen(GUSS) test to assess swallowing ability to grade severity of dysphagia.

Suggestion for further studies:

- Further study is proposed to assess the effect of educational program on nurses' performance regarding feeding for patient with stroke associated pneumonia.

Table 1: Frequency Distribution of the Studied Nurses According to Their Demographic Data (n=40).

Demographic data	No.	%
Age (years)		
20-<25	7	17.5
25-<30	25	62.5
30-<35	5	12.5
35-40	3	7.5
Mean ± SD	27.08±4.01	
Gender		
Male	18	45.0
Female	22	55.0
Marital status		
Married	15	37.5
Not married	25	62.5
Residence		
Rural	22	55.0
Urban	18	45.0
Educational level		
Nursing Diploma	6	15.0
Nursing Technical Institute	29	72.5
Bachelor of Nursing	5	12.5
Years of experience		
1-<5	21	52.5
5-<10	12	30.0

10-15	7	17.5
Mean ± SD	5.68 ± 3.24	
Training courses regarding stroke associated pneumonia		
Yes	9	22.5
No	31	77.5
Monthly income		
Enough	10	25.0
Not enough	30	75.0

SD= Standard deviation

Table 2: Frequency Distribution of Nurses' Knowledge Regarding Feeding Strategies for SAP (n=40).

Items	Correct		Incorrect	
	N o.	%	N o.	%
Purpose of performing swallowing test	14	35.0	26	65.0
Nurse actions before performing a swallowing test	14	35.0	26	65.0
Indications for gastric tube or parental nutrition	14	35.0	26	65.0
Reason for preferring a gastric tube instead of parental nutrition	21	52.5	19	47.5
The method of a gastric tube to reduce aspiration	14	35.0	26	65.0
Actions to reduce the incidence of SAP during gastric feeding	18	45.0	22	55.0
Nurse actions to determine completion of the digestion process	15	37.5	25	62.5
Disadvantages of parental nutrition	13	32.5	27	67.5

	5	5	5	5
Nurse actions during gastric tube or parental nutrition	20	50.	20	50.
Indications of feeding patient orally	11	27.5	29	72.5
The patient's position after oral or gastric tube feeding	25	62.5	15	37.5
Nurse actions when GRV reaching 500	10	25.	30	75.
Signs and symptoms of dysphagia	26	65.	14	35.
Nurse actions for dysphagia signs appear during or after the patient's oral feeding.	22	55.	18	45.
Nursing care for a patient with SAP who suffers from dysphagia.	21	52.5	19	47.5
Nurse actions when feeding a patient with high blood pressure	25	62.5	15	37.5
Nurse actions when feeding a patient with diabetes mellitus	27	67.5	13	32.5
Nurse actions when feeding a patient with heart disease	19	47.5	21	52.5
Nurse actions when feeding a patient with liver cirrhosis	18	45.	22	55.
Nutrition strategies for patients with dysphagia	10	25.	30	75.

X²: Chi Square Test. *Significant at p < 0.05. **highly significant at p < 0.01

Table 3: Frequency Distribution of Total Nurses' Knowledge Regarding Feeding for Stroke Associated Pneumonia (n=40).

Knowledge	Satisfactory		Unsatisfactory	
	No.	%	No.	%
Anatomy and physiology of respiratory	10	25.0	30	75.0

system				
Stroke-associated pneumonia	7	17.5	33	82.5
Feeding strategies	6	15.0	34	85.0
Oral care	5	12.5	35	87.5
Total knowledge score	6	15.0	34	85.0
Mean SD	28.70±9.38			

X²: Chi Square Test. t= Paired test. (***) highly Statistically significant at p <0.01.

Table 4: Frequency Distribution of Total Nurses' Practice Regarding Feeding for Stroke Associated Pneumonia (n=40).

Practice	Satisfactory		Unsatisfactory	
	No	%	No.	%
Swallowing test	17	42.5	23	57.5
Residual amount assessment	4	10.0	36	90.0
Nurses' practice before, during and after gastric gavage	8	20.0	32	80.0
Administering medications via a gastric tube	9	22.5	31	77.5
Hydration status assessment	5	12.5	35	87.5
Oral care	10	25.0	37	75.0
Total practice score	8	20.0	32	80.0
Mean SD	86.85±14.1			

X²: Chi Square Test. t= Paired test. (***) highly Statistically significant at p <0.01.

Table 5: Relation between Demographic Data of the Studied Nurses and Their Total Knowledge (n=40).

Demographic data	Levels of total knowledge		X ²	P-Value
	Satisfactor	Unsatisfac		

		y (n=6)		tory (n=34)			
		No.	%	No.	%		
Age (year)	20-<25	1	16.7	6	17.6	1.905	0.592
	25-<30	5	83.3	20	58.8		
	30-<35	0	0.0	5	14.7		
	35-40	0	0.0	3	8.8		
Gender	Male	2	33.3	16	47.1	FET	0.673
	Female	4	66.7	18	52.9		
Marital status	Married	2	33.3	13	38.2	FET	1.000
	Not married	4	66.7	21	61.8		
Residence	Rural	6	100.0	16	47.1	FET	0.024*
	Urban	0	0.0	18	52.9		
Educational level	Nursing Diploma	0	0.0	6	17.6	32.47	0.000**
	Nursing Technical Institute	1	16.7	28	82.4		
	Bachelor of Nursing	5	83.3	0	0.0		
Years of experience	1-<5	6	100.0	15	44.1	6.387	0.041*
	5-<10	0	0.0	12	35.3		

	10-15	0	0.0	7	20.6		
Attendance of training courses	Yes	6	100.0	3	8.8	FET	0.000**
	No	0	0.0	31	91.2		
Income	Enough	6	100.0	4	11.8	FET	0.000**
	Not enough	0	0.0	30	88.2		

0 χ^2 : Chi square test, 1p: Relation in pre intervention, 2p: Relation in post intervention, FET: Fisher exact test

Table 6: Correlation Between Total Nurses' Knowledge Score and Total Practice Score Regarding Feeding for Stroke Associated Pneumonia (n =40)

Variables		Knowledge subscales				
		Anatomy and physiology of respiratory system	Stroke-associated pneumonia	Feeding strategies	Oral care	Total knowledge score
Swallowing test	R	0.474	0.413	0.367	0.383	0.443
	P	.002**	.008*	.020*	.015*	.004**
Residual amount assessment	R	0.434	0.593	0.671	0.697	0.664
	P	.005**	.000*	.000**	.000**	.000**
Nurses' practices before, during and after gastric gavage	R	0.523	0.731	0.698	0.687	0.738
	P	.001**	.000*	.000**	.000**	.000**
Administering medications via	R					

a gastric tube	P	0.315 .047*	0.495 .001*	0.592 .000**	0.563 .000**	0.553 .000**
Hydration status assessment	R P	0.378 .016*	0.579 .000*	0.605 .000**	0.658 .000**	0.617 .000**
Oral care	R P	0.673 .000**	0.674 .000*	0.734 .000**	0.607 .000**	0.748 .000**
Total practices score	R P	0.536 .000**	0.708 .000*	0.744 .000**	0.726 .000**	0.757 .000**

r= correlation coefficient test. p= p-value. * Significant at $p < 0.05$. **Highly significant at $p < 0.01$.

Interpretation of r: Weak (0.1-0.24) Intermediate (0.25-0.74) Strong (0.75-0.99) Perfect (1).

References:

1. Abdel-Fattah S, and Mohammed A. (2019). Impact of nursing guidelines on nurses' knowledge and performance regarding to prevention of ventilator associated pneumonia in neonates, Journal of Nursing Education and Practice, 1(9) ,Pp:1-15.
2. Abou Zed S. A. F, and Mohammed A. A. (2019).Impact of nursing guidelines on nurses' knowledge and performance regarding to prevention of ventilator associated pneumonia in neonates, Journal of Nursing Education and practice, 9(10), Pp: 1-14.
3. Alexandrou M. E, Balafa O, and Sarafidis P. (2020). Assessment of hydration status in peritoneal dialysis patients: validity, prognostic value, strengths, and limitations of available techniques, American Journal of Nephrology, 51(8),Pp: 589-612.
4. Amin F. M, Abu Samra O. M, and Lawend J. A. (2021). Effect of care bundle strategies on nurses' performance regarding prevention of ventilator associated pneumonia at neonatal intensive care units, Tanta scientific nursing journal, 23(4), Pp: 96-115.
5. Ali, N. S. (2013). Critical Care Nurses' knowledge and compliance with ventilator associated pneumonia bundle at Cairo university hospitals, Crit Care, 4(15), Pp: 66-78.

6. Aloush, S. M. (2018). Nurses' implementation of ventilator-associated pneumonia prevention guidelines: an observational study in Jordan. *Nursing in critical care*, 23(3), Pp: 147-151.
7. Al-Waly L.A.M, Al-Wily M. A. S, and Ibrahim R. H. (2020). Nurses' knowledge regarding pneumonia in children under five years of age at pediatric wards in Kirkuk Teaching Hospitals, *Indian Journal of Forensic Medicine & Toxicology*, 14(2), Pp:1705-1710.
8. Arsava E, Aydoğdu I, Gungor L, Isikay C.T, and Yaka, E. (2018): Nutritional approach and treatment in patients with stroke, an expert opinion for Turkey. *Turkish Journal of Neurology*, 24(3), Pp:226-242.
9. Assefa M, Tadesse A, Adane A, Yimer M, and Tadesse M. (2022). Factors associated with stroke associated pneumonia among adult stroke patients admitted to university of Gondar hospital, Northwest Ethiopia. *Scientific Reports*, 12(1), Pp:1-8.
10. Bell C. L, Tamura B. K, Masaki K. H, and Amella E. J. (2016): Prevalence and measures of nutritional compromise among nursing home patients: weight loss, low body mass index, malnutrition, and feeding dependency, a systematic review of the literature, *Journal of the American Medical Directors Association*, 14(2), 94-100.
11. Bray, B. D., Smith, C. J., Cloud, G. C., Enderby, P., James, M., Paley, L., Tyrrell, P., Wolfe, C. D. A., Rudd, A. G., & SSNAP Collaboration (2018): The association between delays in screening for and assessing dysphagia after acute stroke, and the risk of stroke-associated pneumonia. *Neurology, Neurosurgery and Psychiatry*, 25-30, doi.org/10.1136/jnnp-2016-313356, Pp:88.
12. Castillo, A. (2021). Improving nurses' knowledge of aspiration pneumonia prevention for stroke patients with dysphagia: A quality improvement project, Retrieved from <https://digitalcommons.fiu.edu/cnhs-studentprojects/26/> , Accessed on 14, January, 2024 at 11pm.
13. Dagnev Z. A, Abraham I. A, Beraki G. G, Tesfamariam E. H, Mittler S, and Tesfamichael Y. Z. (2020). Nurses' attitude towards oral care and their practicing level for hospitalized patients in Orotta National Referral Hospital, Asmara-Eritrea: a cross-sectional study, *BMC nursing*, 19(1), Pp: 1-9.
14. Das S, Banerjee T, Biswas A, Lipska K, and Sylaja P. (2019). Stroke-associated pneumonia: management issues, *neurosciences in rural practice*, 10(03), Pp:472-473.
15. Dawn O. (2020): Standard Gastric Residual Volumes (GRV) Protocol Guidelines, available at: <https://www.utoledo.edu/policies/utmc/nursing/guidelines/general/pdfs/standard-gastric-residual-volumes-grv-protocol>, Pp:1-4.
16. Ebraheim M.N, Desoky G.M, and Eltaib, F.A. (2024). Effect of Competency-Based Program on Nurses' Performance and Outcomes of Patients with Post-Stroke Dysphagia, *Egyptian Journal of Health Care*, 15(1), Pp:1371-1390.
17. Gerida A, El-Sheikh O, and Abdelraouf S. (2022). Nurses' knowledge and performance regarding infection preventive measures for ventilators associated pneumonia, *Mansoura Nursing Journal*, 9(2), Pp: 291-297.
18. Grossmann I, Rodriguez K, Soni M, Joshi P. K, Patel S. C, Shreya D, and Sange I. (2021): Stroke and Pneumonia: Mechanisms, Risk Factors, Management, and Prevention, *Cureus*, 13(11), Pp:1-9.

19. Kalyan G, Bibi R, Bhatti R, Kumari R, and Kaur,R.(2020). Knowledge and practices of intensive care unit nurses related to prevention of ventilator associated pneumonia in selected intensive care units of a tertiary care centre, India. *Iranian Journal of Nursing and Midwifery Research*, 25(5), Pp: 369-375.
20. Khalil N, Mohamed H, and Sayed O. (2021). Impact of educational program regarding ventilator-associated pneumonia bundle on critical care nurses' knowledge and practices, *Mansoura Nursing Journal*, 8(3),Pp:301-318.
21. Liu Z. Y, Wei L,Ye R. C, Chen J, Nie D, Zhang G ,and Zhang X. P. (2022). Reducing the incidence of stroke-associated pneumonia: an evidence-based practice, *BMC neurology*, 22(1), Pp: 297-305.
22. Mostafa A. H, Mehany M. M, and Ahmed M. A. E. (2019).Effect of educational program on nurses' knowledge and practice about oxygen therapy, *Assiut Scientific Nursing Journal*, 7(18), Pp:95-104.
23. Metwaly E. A, Mohammed E. H and Mohammed M. A. E (2013): Nurses' performance regarding nasogastric tube feeding in intensive care units, *Zagazig Nursing Journal*, 9(1), Pp:69-86.
24. Osawa A, Maeshima S and Tanahashi, N. (2013): Water-swallowing test: screening for aspiration in stroke patients. *Cerebrovascular diseases*, 35(3),Pp: 276-281.
25. Weheida S. M, Omran E. S, and Taha A. S. (2022). Effect of Designed Bundle Protocol about Ventilator Associated Pneumonia on Nurses' Performance, Compliance, and Patient Outcomes,*Evidence-Based Nursing Research*, 4(3), Pp:71-85.
26. Yousef S, Abd El-Monem H, and Rady S. (2020): Effect of Swallowing Training Rehabilitation Program on Severity of Dysphagia and Swallowing Trial among Patients with Cerebrovascular Stroke, *Egyptian Journal of Health Care*, 11(3), Pp:1-9.
27. Zain ELdin N, Omar T, Ahmed H, and Kamar L. (2018). Effect of A Nursing Care protocol on the Duration of Hospitalization of Children with Pneumonia, *Menoufia Nursing Journal*, 3(2), Pp:1-11.
28. Zhang X, Zhao J, Zheng L, Li X, and Hao Y. (2022). Implementation strategies to improve evidence-based practice for post-stroke dysphagia identification and management: A before-and-after study, *International Journal of Nursing Sciences*, 9(3), Pp: 295-302.