

DYSPHAGIA SCREENING PROTOCOL FOR ACUTE STROKE PATIENT: A LITERATURE REVIEW

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ABSTRACT

Background: Nearly two-thirds of acute stroke patients have dysphagia. Dysphagia defined as difficulty in swallowing of liquids or food, vary in severity with symptoms ranging from mild throat discomfort to inability to eat. It's well known that dysphagia is associated with aspiration pneumonia, dehydration, malnutrition, prolonged length of stay, and increased mortality. Early screening reduces pneumonia rates in stroke and it is usually performed by nurses. Dysphagia screening is recommended but no protocol or tool is pointed.

Aim: the aim of this study is to conduct a literature review of dysphagia screening for stroke patient

Methods: Literature search three databases (Scopus, Proquest, and Science Direct), with the keywords "Dysphagia" AND "Stroke" AND "Nursing", published in English between 2019 and 2021.

Result: Twenty five publications relating to dysphagia screening met the inclusion criteria. There are five methods of dysphagia screening performed by nurses or other health workers: 1) a simple Questionnaire Test (4QT) method, which is by asking the following four questions: does the patient cough or choke while eating or drinking; whether the patient takes longer than usual to eat; does the patient change the thickness of the food to be able to swallow, and whether the voice turns hoarse after eating or drinking; 2) Water Swallow Test (WST) method; 3) Bed Side Screening Tool for Dysphagia (BSTD) method; 4) Volume Viscosity Swallow Test (V-VST) method, namely modification of feeding with first pudding, nectar and finally water; 5) Simplified Cough Test Method. The five screening methods for dysphagia above have been tested for sensitivity and specificity, as well as positive and negative predictive values

Conclusion: screening is a first step in the identification of swallowing impairment or dysphagia of stroke patient. Dysphagia is an independent predictor of poor patient outcome and prolonged recovery time. Nurse has an important role to conduct a screening and must ensure that the selected tools has high reliability and concurrent validity.

Key Words: Stroke, Dysphagia, Screening, Nursing

INTRODUCTION

Stroke is a leading cause of disability and death worldwide. The major concerns in the acute stroke are the ability to swallow safely, without aspirate and to be able to maintain nutrition. Stroke may lead to mild, moderate or severe swallowing difficulties. Several recent studies highlight the impact of dysphagia on dehydration, malnutrition, and aspiration pneumonia. Aspiration pneumonia was associated with prolonged hospital stay; worsening stroke patient outcome, and increased mortality (1-6).

The physiological swallowing process consists of three phases, namely the oral, pharyngeal, and esophageal phases. Approximately 65-90% of dysphagia patients experience disturbances in the oropharyngeal phase, changes in lung function, risk of aspiration, nutrition, and quality of life (8). However, in some patients dysphagia will improve spontaneously within one week after the attack, about 50% will persist for up to six months, and a small proportion will be permanent. A study conducted by Souza et al showed that stroke patients with dysphagia and had nasogastric tube increased the risk of disability (OR: 14,97); CI: 2.68-83.65; p = 0.002) and mortality (OR: 9.79; CI: 2.21-43.4; p = 0.003) within 90 days after stroke (8)

Dysphagia screening can detect swallowing problems early in acute stroke patients and prevent aspiration or other complications such as dehydration or nutritional problems. According to the recommendations of the American Heart Association (AHA) / American Stroke Association, screening for dysphagia should be performed in all acute stroke patients before giving the patient any food, water, or an oral medicine. Patient who failed dysphagia screening were more likely to develop pneumonia (13,1% versus 1,9%), to have more severe disability (52,4% versus 18,0%), and to be discharge to a long term care institution (14,0% versus 4,3%). The AHA also recommends that dysphagia screening be carried out by speech therapists or other trained health professionals (25). Patients can have a stroke at any time of the morning, afternoon, or evening. Because nurses are on duty 24 hours in the Emergency Room or the Stroke Unit, it is the nursing profession that is most likely to screen for dysphagia. A qualitative study on dysphagia screening by Couto and Oliveira showed that nurses had different perceptions and used different protocols and instruments to conduct dysphagia screening (1)

Various screening methods for dysphagia have been developed and have satisfactory sensitivity and specificity. There is a need for protocol and dysphagia screening policies for

stroke patients in the emergency room or the Stroke Unit by hospital management so that dysphagia screening can be carried out on time and procedures.

METHOD

The design of this research is a literature review. The article should describe the variables corresponding to the problem discussed. Search for articles using the operator of "or" and "and". The data collection was carried out in April 2021 with the keywords "Dysphagia" and "Stroke" and "Nursing". Data based used were Scopus, Science Direct, and Proquest with inclusion criteria using full text, the document type is an article and English language in the period of 2019 to 2021. We obtained 240 articles which were 133 from Scopus, 10 from Science Direct, and 97 from Proquest. The articles were then screened by reading the main article part with focusing on the topic and the suitability of the article content from the abstract, methods, and the result. In the end, five articles matched the predetermined criteria and were used in this literature review.

RESULT

Table 1 Distribution of current dysphagia screening methods and the result

Researcher, Year	Title	Result
Oliveira et al, 2020	Nurses' preferred items for dysphagia screening in acute stroke patients: A qualitative study	20 nurses have different perceptions based on patient clinical data and the screening instruments (1)
Eltringham et al, 2019	Variation in dysphagia assessment and management in acute stroke: An interview study	Fifteen nurses from five hospitals thought that there was no standardized dysphagia screening protocol in the hospital (15)
Tsang et al, 2020	A New Simple Screening Tool—4QT: Can It Identify Those with Swallowing Problems? A Pilot Study	100% sensitivity, 80.4% specificity. The 4QT instrument is very sensitive for screening for dysphagia but is not specific for stroke patients. A positive prediction of 50%, only 50% of patients screened for dysphagia after reconfirmation by speech therapists that it is true dysphagia (4).

<u>Melgaard et al. 2020</u>	Systematic dysphagia screening of elderly persons in the emergency department—a feasibility study	A nurse applying the Simple Water Swallow test was subsequently reconfirmed by the occupational therapist. The result is that screening for dysphagia in the elderly can be carried out by nurses in the Emergency Room (6)
Immovilli, 2021	Diagnostic Accuracy of a Bedside Screening Tool for Dysphagia (BSTD) in Acute Stroke Patients	Nurses screened using BSTD in 33.3% of cases and speech therapists in 30% of cases. The result is Cohen K 0.92 (optimal suitability when $K > 0.8$), sensitivity 100%, specificity 95.2% (7)
Dong, Huang, & Dong, 2021	The Modified Volume-Viscosity Swallow Test as a Predictor of Aspiration Pneumonia after Acute Ischemic Stroke	The dysphagia screening method using the modified V-VST is an easy-to-use and reliable screening tool for the detection of dysphagia in stroke patients (11).
Masahiro et al, 2020	Simplified cough test can predict the risk for pneumonia in patients with acute stroke	The Simplicity Cough Test method is a strong indicator for predicting pneumonia in acute stroke patients (3).

DISCUSSION

DYSPHAGIA

Stroke is the third leading cause of death in the world (1,2) and the first leading cause of death in Indonesia. Most of the causes of death of stroke patients are lung infections as a complication of dysphagia, with a mortality rate of 12.8% higher than stroke patients without dysphagia (3). In general, the incidence of dysphagia in the world is about 8% of the population, and the incidence of dysphagia in stroke patients is very high, reaching almost 80% (1, 3, 4, 8). Dysphagia is a disorder in swallowing food and or fluids, as a result of muscle weakness in swallowing in stroke patient or as a result of the aging process. Nearly half of the elderly in Spain (47.4%) who are over 70 years old experienced dysphagia (4). Dysphagia can lead to complications, such as aspiration pneumonia; dehydration; and malnutrition (1, 2, 4, 6, 10, 20, 24), which in turn can lead to prolonged hospital stay; psychological disorders such as stress, anxiety, and depression; decreased quality of life; increased health costs; increased mortality and decreased patient outcomes after stroke (8). Management of dysphagia patients is carried out by a multidisciplinary team approach, consisting of doctors, nurses, speech therapists, occupational therapists, and nutritionists. The nurse uses a nursing process that begins with an assessment, specifically the assessment of swallowing function by screening for dysphagia. The results of a

study on nurses' perceptions regarding the assessment of swallowing function in stroke patients are very important, but the results of these assessments are not well documented, especially if they do not use protocol or instruments screening (14)

DYSPHAGIA SCREENING

The purpose of screening for dysphagia is to screen whether or not it is safe for patients to eat, drink and take oral medications (4, 7, 10, 23). According to the recommendations of the 2019 AHA, all stroke patients should be treated with dysphagia screening before eating, drinking, or receiving oral medication (25). Screening for dysphagia should be carried out as early as possible in the Emergency Room, so that safe feeding and drinking techniques can be established for patients to prevent aspiration, which is less than one hour after the patient is admitted to the Emergency Room (5). But the results of the 2020 Fairfield study proved that the majority of dysphagia screening (93%) was performed for less than 24 hours, and only 34% of them took less than 4 hours (5). The AHA also recommends that those who screen for dysphagia in stroke patients be trained speech therapists or other health professionals (25). Except for examinations using special tools such as Video-fluoroscopy (VFS) and Fiberoptic Endoscopy Evaluation of Swallowing (FEES) must be done by a doctor, as well as Carotis Auscultation by a Speech Therapist. However, there is no consensus in four countries, namely the US, UK, Canada, and Australia, regarding who is most recommended for dysphagia screening in the Emergency Room (5). Nurses are essential in the emergency team and should ideally be able screen and prioritise dysphagia management in stroke patient. A cross sectional study by Knight et al showed the majority nurses (n=100; 76,9%) had care for stroke patients with swallowing difficulty, with only 26,9% having received training about stroke care (22). Otherwise, based on study by Oliveira, Couto, and da Mota, the results of screening for dysphagia by nurses are as valid as those carried out by other professions. Likewise, the study results of Immovilli et al showed an Excellent Agreement > 0.8 between screening performed by nurses and Speech Pathologist or Occupational Therapist (1, 2, 7).

SCREENING PROTOCOL

There is no consensus on the method of screening for dysphagia between hospitals, so the use of protocols or instruments still varies. The oldest and most frequently used method is the

Water Swallowing Test (1, 5-7). The test by giving water varies depending on the perception of the nurse, ranging from 3 ml, 5 ml, 10 ml, 20 ml, 50 ml to 60 ml. Although the sensitivity and reliability are satisfactory, there is a risk that the patient aspirates and experiences oxygen desaturase, so pulse oximetry and oxygen must be prepared. The second instrument is a questionnaire containing 4 questions to the patient or family or 4QT. Questions include: is there a cough or choking after eating; does it take longer than usual to eat more; is there a change in consistency with meals; and whether there is a change in voice after eating or drinking. Although this method is very sensitive, it is less specific to use for fusing dysphagia in stroke patients (4). The next method is the Oropharyngeal Dysphagia Screening Test for Patients and Professionals (ODS-PP). This method is also a questionnaire for patients consisting of 18 question items, among others: is there a cough or choking during and after eating or drinking; is their shortness of breath; whether there is a change in voice after eating or drinking. In general, the ODS-PP method has high reliability and concurrent validity. This test takes about 10 minutes and can be done by anyone. The disadvantage is that this is an initial study and a small sample, further research is needed by adding samples and expanding the research area.

CONCLUSION

Dysphagia in stroke patients must be managed properly, starting from early detection through dysphagia screening as part of nursing assessment. The objectives of screening are to prevent aspiration and establish efficient and safe oral intake for stroke patients. Screening should be carried out as early as possible less than one hour after the patient arrives at the Emergency Room. The methods and instruments used must be simple, require a short time, have a low risk, and the screening tool would have both high sensitivity and high specificity.

Daftar pustaka

1. Couto GR, da Mota LAN, Olivera I de J. Nurses' preferred items for dysphagia screening in acute stroke patients: A qualitative study. *Nurs Pract Today*. 2020;7(3):226–33.
2. Wright DJ, Smithard DG, Griffith R. Optimising medicines administration for patients with dysphagia in hospital: Medical or nursing responsibility? *Geriatr*. 2020;5(1):1–10.
3. Quirós S, Serrano F, Mata S. Design and Validation of the Oropharyngeal Dysphagia Screening Test for Patients and Professionals: A Preliminary Study. *Dysphagia* [Internet].

- 2020;35(1):52–65. Available from: <https://doi.org/10.1007/s00455-019-09999-4>
4. Tsang K, Lau ESY, Shazra M, Eyres R, Hansjee D, Smithard DG. New simple screening Tool-4QT: Can it identify those with swallowing problems? A pilot study. *Geriatr.* 2020;5(1):1–9.
 5. Fairfield CA, Smithard DG. Assessment and management of dysphagia in acute stroke: An initial service review of international practice. *Geriatr.* 2020;5(1):1–13.
 6. Melgaard D, Sørensen LR, Lund D, Leutscher P, Ludwig M. Systematic dysphagia screening of elderly persons in the emergency department—a feasibility study. *Geriatr.* 2020;5(4):1–7.
 7. Immovilli P, Rota E, Morelli N, Marchesi E, Terracciano C, Zaino D, et al. Diagnostic Accuracy of a Bedside Screening Tool for Dysphagia (BSTD) in Acute Stroke Patients. *J Stroke Cerebrovasc Dis [Internet]*. 2021;30(2):105470. Available from: <https://doi.org/10.1016/j.jstrokecerebrovasdis.2020.105470>
 8. Souza JT, Ribeiro PW, de Paiva SAR, Tanni SE, Minicucci MF, Zornoff LAM, et al. Dysphagia and tube feeding after stroke are associated with poorer functional and mortality outcomes. *Clin Nutr.* 2020;39(9):2786–92.
 9. Maria Schwarz, a, b Elizabeth C. Ward, b, c Petrea Cornwell, d Anne Coccetti, a Pamela D’Netto, e Aimee Smith e and KM-D, Purpose: Exploring the Validity and Operational Impact of Using Allied Health Assistants to Conduct Dysphagia Screening for Low-Risk Patients Within the Acute Hospital Setting. *Nord Alkoholtidskrift (Nordic Alcohol Stud.* 1996;13(5–6):318–20.
 10. Debra M. Suiter, a Stephanie K. Daniels, b Julie M. Barkmeier-Kraemer c and AHS, Purpose: Swallowing Screening: Purposefully Different From an Assessment Sensitivity and Specificity Related to Clinical Yield, Interprofessional Roles, and Patient Selection. *Horm Res Paediatr.* 2006;65(4):29–34.
 11. Dong Y, Hu B, Huang S, Ye T, Dong Q. The Modified Volume-Viscosity Swallow Test as a Predictor of Aspiration Pneumonia after Acute Ischemic Stroke. *Clin Neurol Neurosurg [Internet]*. 2021;200:106351. Available from: <https://doi.org/10.1016/j.clineuro.2020.106351>
 12. Nakamori M, Imamura E, Kuwabara M, Ayukawa T, Tachiyama K, Kamimura T, et al. Simplified cough test can predict the risk for pneumonia in patients with acute stroke. *PLoS One [Internet]*. 2020;15(9 September):1–12. Available from: <http://dx.doi.org/10.1371/journal.pone.0239590>
 13. Wu CC, Huang HH, Lin HH, Chang WK. Oropharyngeal dysphagia increased the risk of pneumonia in patients undergoing nasogastric tube feeding. *Asia Pac J Clin Nutr.* 2020;29(2):266–73.
 14. Oliveira I de J, de Almeida SIF, da Mota LAN, Couto GR. Conceptualization of nursing care to the person with post-stroke dysphagia. *Rev Enferm Ref.* 2020;2020(4):1–7.
 15. Eltringham SA, Smith CJ, Pownall S, Sage K, Bray B. Variation in dysphagia assessment and management in acute stroke: An interview study. *Geriatr.* 2019;4(4):1–12.
 16. Juan W, Zhen H, Yan-Ying F, Hui-Xian Y, Tao Z, Pei-Fen G, et al. A Comparative Study of Two Tube Feeding Methods in Patients with Dysphagia After Stroke: A Randomized Controlled Trial. *J Stroke Cerebrovasc Dis [Internet]*. 2020;29(3):104602. Available from: <https://doi.org/10.1016/j.jstrokecerebrovasdis.2019.104602>
 17. Aruga Y, Saito A, Aoki Y. Nursing care using Kt (Kuchi-Kara Taberu) index radar chart enabling elderly patients with dysphagia to live like human beings after initiating

- gastrostomy feeding. *Proc Singapore Healthc.* 2018;27(2):136–8.
18. Kenedi H, Campbell-Vance JB, Reynolds J, Foreman M, Dollaghan C, Graybeal D, et al. Implementation and analysis of a free water protocol in acute trauma and stroke patients. *Crit Care Nurse.* 2019;39(3):e9–17.
 19. Bartlett RS, Thibeault SL. Insights into oropharyngeal dysphagia from administrative data and clinical registries: A literature review. *Am J Speech-Language Pathol.* 2018;27(2):868–83.
 20. Tagliaferri S, Lauretani F, Pelá G, Meschi T, Maggio M. The risk of dysphagia is associated with malnutrition and poor functional outcomes in a large population of outpatient older individuals. *Clin Nutr.* 2019;38(6):2684–9.
 21. Wang T, Zhao Y, Guo A. Association of swallowing problems with frailty in Chinese hospitalized older patients. *Int J Nurs Sci [Internet].* 2020;7(4):408–12. Available from: <https://doi.org/10.1016/j.ijnss.2020.09.005>
 22. Knight K, Pillay B, van der Linde J, Krüger E. Nurses' knowledge of stroke-related oropharyngeal dysphagia in the eastern cape, south africa. *South African J Commun Disord.* 2020;67(1):1–7.
 23. Fortes AA, André-Brylle J, Westmark S, Melgaard D. Primary healthcare professionals experience of transfer and meaning according to screening for dysphagia. *Geriatr.* 2019;4(4).
 24. Guidelines CN. Chinese expert consensus on food and nutrition management for dysphagia (2019 version). *Asia Pac J Clin Nutr.* 2020;29(2):434–44.
 25. Powers WJ, Rabinstein AA, Ackerson T, Adeoye OM, Bambakidis NC, Becker K, et al. Guidelines for the early management of patients with acute ischemic stroke: 2019 update to the 2018 guidelines for the early management of acute ischemic stroke a guideline for healthcare professionals from the American Heart Association/American Stroke A. Vol. 50, *Stroke.* 2019. 344–418 p.