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Improving post-stroke dysphagia screening in the intensive care unit.

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Improving Post-Stroke Dysphagia Screening in the Intensive Care Unit

by

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Dedication

This DNP project is dedicated to my parents, Mike and Tracy. You provided me with unwavering love and support during this endeavor and I am forever indebted to you. It is also dedicated to my Grandmother, Barbara and my Grandfather, Carl who both passed during my DNP venture. I miss you and wish you could be here to witness the completion of my doctoral degree. I hope I always made you proud.

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Contents

Abstract

Background: Dysphagia screening is a critical aspect in the care of patients experiencing acute stroke and dysphagia may often determine life or death following a stroke event. Inconsistent nurse dysphagia assessment and documentation were identified in the Medical/Surgical Intensive Care Unit project organization.

Purpose: The purpose of this project was to explore the impact of an educational program on stroke nurse dysphagia screening and nursing self-efficacy in the ICU.

Methods: Fifteen nurses completed a modified General Self-Efficacy Scale survey which measured nurse perceptions of change in their own self-efficacy to perform dysphagia screenings; dysphagia screening rates and rates of dysphagia diagnoses were also obtained.

Intervention: An educational workshop was provided to ICU nurses on the organization dysphagia screening protocol including a digital case-based scenario to achieve increased nurse learning and improve nurse self-efficacy.

Results: Paired *t*-tests determined that general nursing self-efficacy to perform and document dysphagia screenings improved post-intervention. During the 8-week project, more nurse bedside dysphagia screenings were performed, and more patients were identified with dysphagia post-project.

Discussion: This project demonstrated that dysphagia screening in the ICU improves identification of dysphagia and improves nurse self-efficacy to screen for dysphagia.

Keywords: *dysphagia screening, stroke, deglutition disorders, improvement interventions, nurse self-efficacy, problem-based learning, case-based learning, and clinical practice, pneumonia, cost, expense, clinical competence, self-efficacy, education, nursing/methods*

Improving Post-Stroke Dysphagia Screening in the Intensive Care Unit

Problem Statement

Every year in the United States (U.S.), one person will be diagnosed with a stroke every forty seconds and approximately every four minutes, someone will die of a stroke (Centers for Disease Control and Prevention [CDC], 2022). More than 795,000 people will suffer from a stroke yearly in the U.S., and stroke has become the fifth leading cause of death in Americans (Centers for Disease Control and Prevention [CDC], 2022). Between 2014 and 2015, stroke-related costs in the U.S. totaled approximately forty-six billion dollars, according to the CDC (2022). Blood vessels carry oxygen and nutrients to each area of the brain. A stroke occurs when a vessel is either blocked by a blood clot (ischemic stroke), or when a vessel ruptures (hemorrhagic stroke). If this occurs, areas of the brain distal to the injury are deprived of oxygen and brain cells die (American Stroke Association, 2023). The brain controls many bodily functions and is an extremely complex organ. If blood flow can no longer reach the region of the brain that controls a given body function, this part of the body will no longer perform as it should (American Stroke Association, 2023). Stroke can create serious long-term disabilities in many individuals, and patients diagnosed with stroke must learn to live with a variety of long-lasting effects for the rest of their lives. One of the major effects of stroke is difficulty swallowing (dysphagia).

Dysphagia is predominant in acute stroke victims and affects 50-80% of this patient population (Kim et al., 2020). Dysphagia creates a three to sevenfold increased risk of aspiration pneumonia and can be factored into the patients' mortality rate after a stroke occurs (Singh & Hamdy, 2006). Dysphagia is defined as a swallowing disorder that involves the oral cavity, pharynx, and esophagus (American Speech-Language-Hearing Association, 2023). If a stroke

affects the area of the brain that controls swallowing, it can create weak tongue, check, and esophageal muscles and affect the coordination of swallowing, or totally impair the swallowing process altogether (National Institute on Deafness and Other Communication Disorders, 2014). When food particles or liquids encounter the oral palate and esophagus of a patient with weakened muscles, a patient may not be able to swallow, cough or clear the particles due to the esophageal reduction in sensation and movement. Since the larynx is located just anterior to the esophagus, food and liquid may "spill over" and penetrate the patient airway and enter the lungs (National Institute on Deafness and Other Communication Disorders, 2014). Aspiration pneumonia is one of the most dangerous health-related consequences of dysphagia, and patients who are hospitalized with stroke have a greater than 5-fold increase in mortality if they are diagnosed with Hospital Acquired Pneumonia (HAP).

Current evidence suggests that up to 30% of acute patients with stroke with dysphagia will be treated for HAP (Masrur et al., 2013). Nurses (RN) and Speech-Language Pathologists (SLP) are both educated and trained in evaluating dysphagia nationwide. Nurse bedside swallow screenings can successfully identify dysphagia very early during the nurses' initial assessment of the patient. If swallowing difficulty is quickly identified, a referral to a SLP can be made to allow for a more thorough evaluation (American Speech-Language-Hearing Association, 2023). RN dysphagia screenings do not deter the importance of an assessment by an SLP; but can boost care provided to patients who are at risk (Abu-Snieneh & Sale, 2018). Beside nursing swallow screening can enhance patient safety by quickly identifying dysphagia to decrease potential harmful patient health outcomes. Nurse swallowing screens help reduce the rates of malnutrition, dehydration, and aspiration pneumonia (Abu-Snieneh & Saleh, 2018). Bedside nurses are considered primary health providers and are at a patient's side more than any other ancillary

staff. For this reason, nurses have a specifically important role in reducing hazardous patient outcomes (Abu-Snieneh & Saleh, 2018).

Background & Significance of the Problem

The Joint Commission (TJC) is a health care organization who endorses the most updated evidence of quality improvement and patient safety measures, standards, and performance improvement solutions. TJC develops and dictates stroke performance standards and measures for hospitals nationwide. Standardized performance measures for Primary Stroke Centers (PSC) suggested by TJC (2023) include: performance and documentation of the National Institutes of Health Stroke Scale (NIHSS); minutes from door to transfer to another hospital; venous thromboembolism prophylaxis (VTE); anticoagulation therapy for atrial fibrillation/flutter; thrombolytic therapy; antithrombotic therapy by the end of hospital day 2; discharged on statin medication; stroke education; assessment for rehabilitation; and mechanical endovascular reperfusion therapy for patients who are eligible. TJC (2023) also offers institutional certifications in stroke care and in 2019 the DNP project organization earned its PSC certification as an advanced stroke-care capable center.

According to Donovan et al. (2013), dysphagia screening was once a part of the standardized stroke performance measures, but in 2010 TJC retired dysphagia screening as an absolute standard to track. Although TJC does not actively track dysphagia screening in acute care hospitals, the American Heart Association's (AHA) Get With The Guidelines (GWTG) Stroke recognition criteria quality measures suggest that this patient population be screened for dysphagia. Hospitals who are recognized publicly by the AHA must adhere to the GWTG achievement measures, however, dysphagia screening falls under GWTG's quality measures. Quality measures are suggested practices that are strongly supported by current evidence

(American Heart Association Get With The Guidelines Stroke, 2023) and are proposed to enhance optimization in patient care. Other entities that recommend dysphagia screening include the American Speech-Language-Hearing Association (ASHA), Veteran's Health Administration (VHA), and the CDC's Paul Coverdell Acute Stroke Program. Since current scientific evidence strongly suggests implementation of any valid and reliable formal dysphagia screening protocol, (Hines et al., 2014; Eltringham et al., 2018; American Heart Association Get With The Guidelines Stroke, 2023) dysphagia screening is measured and tracked in patients with acute stroke by the DNP project organization. The DNP project site follows an acute stroke dysphagia screening protocol and requires the following: a nursing bedside dysphagia screening must be performed and documented in the electronic health record (EHR) upon admission to the ICU, and less than 24 hours from admission and/or stroke diagnosis. The organizational compliance goal for acute stroke dysphagia screening is 85-100% compliance monthly (Organization Primary Measure Sets for Stroke, 2023). The current dysphagia screening policy requires an RN bedside dysphagia screening to evaluate for signs or symptoms of dysphagia prior to any food, liquid, or medications being given by mouth (Organization Requirements for Patients with Stroke, 2022). Once the patient receives a diagnosis of stroke, an RN dysphagia swallow screen is favored to be completed and documented upon admission to the ICU, but absolutely must be performed and documented in <24 hours from the time of inpatient admission (Organization Requirements for Patients with Stroke, 2022). The policy states that any patient with a diagnosis of stroke must be kept nothing per mouth (NPO) until an RN dysphagia screening is completed.

When a physician or advanced practice provider suspects a diagnosis of stroke or confirms a stroke, the provider enters the stroke order set into the electronic health record (EHR). Upon the patient's admission to the ICU, a nursing dysphagia screening becomes part of the list

of nursing orders. In addition, a SLP consult automatically populates. This consult order gives the SLP team the opportunity to ensure a nurse dysphagia screening was performed in patients admitted with acute stroke. The SLP team can address missed nurse screenings and/or can be available for any concern involving swallowing issues that may occur during the patient's hospitalization.

When the nurse is prepared to conduct the bedside dysphagia screening following a patient admission to the ICU, he/she must then independently navigate to the Stroke Navigator tab and select "Ischemic or Intracerebral Hemorrhage" depending on the type of stroke the patient is experiencing. Under Screening/Scales, the dysphagia screen can be found; Stroke (or rule-out) must be chosen (See Appendix A). The nurse must first complete the Patient Factors Component (Dysphagia: Stroke or Rule-out) Barnes Jewish Hospital Stroke Dysphagia Screen (BJH-SDS) (See Appendix B). A Glasgow Coma Scale (GCS) must first be addressed and documented (See Appendix B). If the patient has a GCS of less than 13 or any "no" response automatically "fails" the dysphagia screening. If the patient GCS is satisfactory, the RN can then move on to assess the patient swallowing abilities and may proceed to the Water Test. The RN must accurately perform and document all sections of the Water Test Component (see Appendix C). If the patient passes all items of the screen, the overall result will be highlighted in green, and the RN will obtain an order from the admitting physician, advanced practice provider, or neurologist for the appropriate diet (See Appendix C). If the patient fails any part of the screen, the overall result will be highlighted in red (See Appendix D). A best practice advisory (BPA) (Appendix E) within the EHR will alert the RN to place the patient diet as NPO and asks the nurse to confirm that a SLP consult is entered so the patient will receive an advanced swallowing evaluation. Instructions within the Dysphagia Screen Fail BPA also advise the RN to contact a

provider for medication instructions and alternative nutrition or hydration source(s). The RN has the option to select Order or Do Not Order. If the RN wants to dismiss the BPA, an acknowledge reason can be entered within the comment free text box. Both pass and fail screenings must be documented within the patient chart in real-time and only under direct patient observation (Organization Competency Review Module RN Dysphagia Screening, 2016). Since many patients with acute stroke may be initially intubated and ventilated for airway protection, some patients arrive to the ICU with mechanical ventilator assistance. Facility protocol states that a dysphagia screening "fail" must still be documented if the patient is receiving mechanical ventilation, even when it is not appropriate to perform a dysphagia screening (Organization Requirements for Patients with Stroke, 2022). The dysphagia screening protocol is part of the ICU Competency Checklist that the critical care RN must perform while on orientation and this process must be confirmed by a preceptor. The BJH-SDS hospital dysphagia screen protocol is also a yearly computer-based module on DevelopYou® that all nurses who are employed at the hospital must complete. The once yearly module gives brief education regarding the BJH-SDS, how to complete and document, and several questions at the end to test the knowledge of the RN.

Literature Review

The PubMed, CINAHL, and Cochrane Library databases were used to perform a literature review to examine interventions that would improve nurse dysphagia screening poststroke. The keywords developed for the search included; dysphagia, screening, dysphagia screening, stroke, improvement interventions, nurse self-efficacy, problem-based learning, case-based learning, and clinical practice. MeSH terms were identified for the above keywords to view the most specific medical articles. PubMed was used to identify the most appropriate MeSH terms to create a more relevant article search; these terms were deglutition disorders,

clinical competence, and education, nursing/methods. In all combinations of searches, the keywords and MeSH terms were specified in the article title or abstract, as well as publications within the past 10 years. Boolean operators "AND" and "OR" were used in multiple combinations of common terms and MeSH terms. All searches were filtered to include only systematic reviews, meta-analyses, and randomized controlled trials. Other inclusion criteria for the articles considered were articles that involved the impact of dysphagia screenings in stroke, the impact of stroke associated pneumonia on hospital costs, interventions to improve nursing self-efficacy to perform screenings, nursing clinical competence, and nursing education. Exclusion criteria considered was dysphagia not caused by stroke, dysphagia and stroke in pediatric populations, and articles that did not pertain to nursing self-efficacy or increasing knowledge. Only English written articles were chosen.

The first search on PubMed included keywords dysphagia screening "AND" stroke filtering for the above-mentioned inclusion criteria. There were 283 results returned, and after independent review, 2 articles were chosen. A third PubMed search was conducted with the keywords deglutition disorders "AND" pneumonia "AND" stroke "AND" costs "OR" expense. There were 4 results returned, and 1 article was chosen. A third PubMed search was conducted with the keywords improvement interventions "AND" nurse self-efficacy "NOT" self-confidence "NOT" nurse-led. There were 138 results returned, and 3 articles were chosen. A fourth PubMed search was conducted with the keywords clinical competence "AND" education, nursing/methods "AND" problem-based learning. There were 4 results returned, and 2 articles were chosen. A fifth PubMed search was conducted with the keywords self-efficacy "AND" clinical practice "AND" case-based learning which demonstrated 3 results, and after 1 duplicate was removed, 1 article was chosen. The CINAHL database was chosen, and a search was

conducted with the keywords problem-based learning “OR” PBL “OR” problem-based learning “AND” nurse self-efficacy. There were 17 results returned, and 1 article was chosen. The Cochrane Library database was chosen, and a search was performed with the keywords case-based learning “AND” nursing self-efficacy. There were 28 articles returned, and 2 articles were chosen. A final number of 12 studies were used for the literature review.

Nurse Dysphagia Screening and Aspiration Pneumonia

Dysphagia screening demonstrates important benefits and reduced pneumonia incidence in adult patients with acute stroke. Systematic reviews in the literature showed significant patient health benefits and reduction of pneumonia rates when a nurse performed a dysphagia screening after acute stroke diagnosis and particularly when the screening took place in <24 hours from the time of admission (Sherman et al., 2018; Eltringham et al., 2018; Hines et al., 2011; Donovan et al., 2013; American Heart Association Get With The Guidelines Stroke, 2023; American Speech-Language-Hearing Association, 2023). Findings suggested that when the screening was offered upon hospital admission, and offered by a healthcare professional who was trained on the screening, improved health outcomes were derived for patients (Sherman et al., 2018; Marin et al., 2020; Bray et al., 2017). Meta analyses showed that 5,252 total pneumonia events occurred in patients with delayed screenings, compared to 1,152 total pneumonia events in patients who received screening upon hospital admission (Sherman et al., 2018). It is well documented that nurse dysphagia screeners should receive adequate training on the type of dysphagia screening tool their prospective facility uses, including the administration and interpretation of the screening (Sherman et al., 2018; Eltringham et al., 2018; Hines et al., 2011; Donovan et al., 2013; The Joint Commission, 2023; American Speech-Language-Hearing Association, 2023). Hospitals can incur increased inpatient costs related to hospital acquired

pneumonia from poststroke dysphagia which is estimated up to $27,633 per patient (Marin et al., 2020). Aspiration related to the presence of post-stroke dysphagia without a nurse dysphagia screening may cause pneumonia in up to 50% of patients (Marin et al., 2020). The literature demonstrates that consistent nursing bedside dysphagia screenings result in improved identification of post-stroke dysphagia, therefore, decreasing the chances of aspiration pneumonia in this patient population.

Nurse Learning and Self-Efficacy

Educational delivery methods to address dysphagia screening were discussed throughout the literature. First, attention to the application of evidence-based practice strategies were described. An evidence-based method of providing education of dysphagia screening is recommended. Portela Dos Santos et al., (2022) estimated that approximately 30%-40% of patients do not receive current evidence-based dysphagia screening. Education is essential for nurses to perform best practice dysphagia screening, unfortunately instruction is lacking in this area (Portela Dos Santos et al., 2022). In the literature, the most common educational processes for nurses to gain information regarding current evidence involve computer-based learning, problem-based learning, and case-based learning. In the last 10 years, computer-based education and electronic learning methods have become some of the most effective and popular ways to promote education among nurses (Rouleau et al., 2019; Gavgani et al., 2015; Wantonoro et al., 2022; Hsu et al., 2014). Nursing self-efficacy to perform patient screenings was very high among nurses who used computer-based learning interventions (Rouleau et al., 2019), and this method of learning provides information to the nurse in a reliable, uniform manner (Portela Dos Santos et al., 2022). Digital case-based learning can stimulate health care provider learning, deliver visual information, and lead to greater clinical thinking skills (Gavgani et al., 2015).

Case-based teaching methods involve presenting authentic scenarios that portray a patient in a real-life situation (National Academy of Sciences, Engineering, and Medicine, 2022). Case-based scenarios can provide interactive and interesting learning experiences (Wantonoro et al., 2022; Hsu et al., 2014; Weidenbusch et al., 2019; Rouleau et al., 2019).

Problem-based learning is another nursing education strategy that has been used across the healthcare continuum that involves solving a patient problem in small groups (National Academy of Sciences, Engineering, and Medicine, 2022). This type of learning is a great approach to nursing education and allows students to develop sufficient self-efficacy (Wong et al., 2021), improve general nursing knowledge and skill performance (Khatiban et al, 2014). Overall, it is suggested that using blended learning methods by combining digital and traditional techniques can improve nursing self-efficacy (Li et al., 2019; Gavgani et al., 2015; Wantonoro et al., 2022).

Problem

A comprehensive needs assessment was conducted in the Medical/Surgical ICU within the organization. It was discovered that nursing stroke dysphagia screening and documentation was inconsistently performed. The Neuroscience Coordinators and the Neuroscience Quality Improvement (QI) Data Analyst provided internal data on dysphagia screening within the organization from October 2021 through June 2022. According to this internal data, dysphagia screening performance and documentation was below the organization's goal of 85-100% compliance rate. The lowest documentation percentage was in June 2021 where only 55% of ICU patients with stroke were screened prior to oral intake. For the duration of the year of 2021, an average of 80% of patients were screened prior to oral intake. The stakeholders identified that nursing self-efficacy and nurse staff shortages played a role in the variability of dysphagia

screening being performed. The data provided by the organization indicated that current dysphagia screening and documentation percentages should be improved by the implementation of a nurse dysphagia screening intervention.

Intervention

Current evidence suggested that early nurse bedside dysphagia screenings in patients diagnosed with acute stroke reduce the incidence of aspiration pneumonia, improve patient outcomes, and decrease hospital costs. Strong evidence-based recommendations confirm that nurse dysphagia screenings should occur early in the patient's admission (Sherman et al., 2021; Bray et al., 2017; Marin et al., 2020), and should absolutely be performed in less than 24 hours (Eltringham et al., 2018; Hines et al., 2011; Donovan et al., 2013; American Heart Association Get With The Guidelines Stroke, 2023; American-Speech-Language-Hearing Association, 2023). Evidence proposes that delays in screening will contribute to diminished patient outcomes (American Speech-Language-Hearing Association, 2023; Bray et al., 2017). Nurses should be properly educated (Portela Dos Santos et al., 2022) and trained on a valid and reliable screening tool (Edmiaston et al., 2014; American-Speech-Language Hearing Association, 2023; American Heart Association Get With The Guidelines Stroke, 2023; The Joint Commission, 2023), such as the BJH-SDS. Problem-based learning conducted in small groups, in addition to digital case-based scenarios have been shown to best enhance nurse learning and generalized self-efficacy to perform patient screenings. Thus, the DNP project lead modeled an intervention based on all current evidence found in the literature.

Summary/Justification

Post-stroke dysphagia and inconsistent nurse dysphagia screenings in the ICU can negatively affect patient outcomes and increase hospital costs. Nurses must be educated on a

proper dysphagia screening tool, and patients diagnosed with acute stroke must receive timely dysphagia screenings. Best practice evidence recommends that using a combination of blended learning styles using digital educational tools that include problem and case-based scenarios have demonstrated an increase in generalized nursing knowledge and self-efficacy when providing patient care.

Rationale

Needs Assessment

When performing a needs assessment within the Medical/Surgical ICU, the DNP project lead met with several stakeholders that have a high level of interest in post-stroke dysphagia screening quality measures and improvement. Discussions took place with the ICU Manager, ICU Nurse Educator, ICU Charge RN, the Neuroscience Coordinators, SLPs, and ICU nursing staff. Multiple reasons were identified as possible causes for inconsistent stroke dysphagia screening. National nursing shortages related to the COVID-19 pandemic created ongoing staffing issues, with the efflux of many long-time staff nurses and the influx of temporary travel nurses. It was identified that travel nurses receive a lesser amount of ICU orientation when compared to staff nurses. All nurses must complete a multi-page packet of ICU RN competencies by the end of the orientation period, of which includes the dysphagia screening protocol and documentation process. A concern was voiced that all nurses are expected to correctly apply the dysphagia screening protocol regardless of their length of orientation. In addition, it was also voiced that ICU RNs may have insufficient self-efficacy to perform and document stroke dysphagia screenings.

Conceptual Framework/Quality Improvement Model

Bandura's Theory of Self-Efficacy

Nursing self-efficacy is an immense contributor to patient care outcomes. Albert Bandura, a psychologist, and professor at Stanford University, coined the term "self-efficacy." He states that personal judgement of a persons' own capability to complete a task can be an important clinical predictor in adequate nursing care (Bandura, 1977). Bandura, 1977 states that self-efficacy can be achieved by performance accomplishments (past experiences), vicarious experiences (observing others), verbal persuasion (coaching and feedback), and physiological feedback (emotional status). A nurse who has performed a task well will feel more competent and will perform future tasks with better confidence (Bandura, 1977). The ability of an RN to perform the BJH-SDS means the RN possesses competent knowledge, skill, and self-efficacy, therefore making its' performance effective. Without adequate self-efficacy of the nurse to complete the screening, the performance of the BJH-SDS may not be attempted (Zaman et al., 2021). Often, nursing documentation reflects the type of care provided by a nurse (Zaman et al., 2021), therefore nursing self-efficacy regarding dysphagia screening is a critical component of quality patient care. Nurses with low self-efficacy experience more self-doubt when they are presented with a challenging task, whereas nurses with high self-efficacy have the confidence to view challenges as opportunities and are known to be more ambitious in the workplace (Schwarzer & Warner, 2020). A visual self-efficacy development model can be viewed on Appendix F. The DNP project attempted to improve nursing self-efficacy using Banduras' theory.

PDSA Cycle

One of the most popular tools developed by the Associates in Process Improvement for quality improvement (QI) projects is the PDSA cycle (Institute for Healthcare Improvement, 2022). This is a simple tool that can be used in health care facilities to accelerate improvement

in a model or tool that the facility may already be using. The DNP project was modeled after this quality improvement model. The PDSA cycle stands for Plan-Do-Study-Act (Appendix G). First, there are questions that must be addressed such as: What are we trying to accomplish? How will we know that a change is an improvement? What change can we make that will result in improvement? Plan in the PDSA cycle involved forming a team, educational materials, pre- and post-tests and surveys, and planning meetings with key stakeholders and ICU RNs. Do in the PDSA cycle involved implementing a workshop to provide education to ICU RNs about the dysphagia screening process, along with discussion of a case-based scenario to further enhance nurse learning. Study in the PDSA cycle involved systematically collecting and analyzing all data gathered pre- and post- intervention. If the DNP project is deemed a success, Act in the PDSA cycle will hopefully involve permanent implementation of the DNP project educational workshop for new and travel RN hires, and for yearly re-education for existing staff.

Purpose and Specific Aims

The purpose of this project was to improve post-stroke dysphagia screening in the ICU. The project examined the impact of an educational program on stroke nurse dysphagia screening rates and improvement in nurse self-efficacy to complete dysphagia screening. The project had three specific aims. Specific aims were to improve RN application of the BJH-SDS performance and to improve documentation rates to >=95% over four consecutive weeks, improve nursing self-efficacy to screen for dysphagia, and to monitor rates of dysphagia diagnoses in patients with acute stroke.

Methods

Design

This project addressed the quality improvement of ICU RN dysphagia screening performance and documentation. This pre-test post-test design identified success or failure of an educational workshop provided to nurses. The hospital dysphagia screening policy, the BJH-SDS, and Bandura's self-efficacy theory were implemented. A digital case-based scenario accompanied each workshop session.

Setting/Environment

The prospective DNP Project site was a 19-bed Medical/Surgical ICU that serves patients with stroke who need critical care services, and the DNP project intervention involved the RNs who were staffed on this unit. The ICU/CCU are known as sister units, and staff approximately 75 RNs collectively. The organization is in Metro Louisville, Kentucky and is a 519-bed hospital. The hospital is a well-known three-time achiever of Magnet designation for excellence in nursing service from the American Nurses Credentialing Center's (ANCC) Magnet Recognition Program. The organization currently maintains its' PSC certification designated by TJC. In 2021, it received the GWTG Stroke Gold Plus Award with Target: Stroke Honor Roll Elite and was voted a high performing facility for stroke care by the U.S. News World Report in 2022.

Sample

The sample for this project included ICU RNs who care for critically ill patients with acute stroke. The project attempted to include as many RNs from the ICU as possible. It was hypothesized that this group would consist of approximately 35 RNs. Inclusion criteria was limited to only RNs hired to work in ICU, RNs who had completed hospital orientation and completed the ICU RN Competency packet and were no longer followed by a preceptor. Exclusion criteria were: CCU RNs, RNs who declined to participate, and travel RNs whose

contracts expired before the last day of the intervention. ICU staff meetings are held and conducted by the ICU Manager quarterly and are mandatory for all staff to attend. The project intervention took place at a quarterly group of ICU staff meetings. Any RNs who actively chose not to participate in the DNP project were asked to opt out at that time.

Context

The DNP student attempted to find, address, and solve the root cause of the problem with inconsistent RN dysphagia screenings. Key stakeholders were determined, and a relationship with them was established. The team developed included two Neuroscience Coordinator RNs, the Neuroscience QI Data Analyst, ICU Manager, ICU RN Educator, and ICU Charge RN. The organization's SLPs also had a high level of interest in the project, and suggestions for improvement were received from them and taken into consideration. After considering all root problems identified by key stakeholders, the DNP project lead selected one root problem that could be changed by a pilot project: staff re-education. Facilitators for the project included the RNs who agreed to participate, along with the above key stakeholders. Multiple patient needs and RN duties in a busy critical care unit, RN turnover rates, and nurse motivation were significant barriers that could not be overcome while planning and implementing this project.

Ethical Considerations/Permissions

The project proposal was submitted to the Institutional Review Board (IRB) for approval. Patient confidentiality and/or any other type of patient information not needed to conduct this project were breached, and Health Information Portability and Privacy Act (HIPAA) compliance standards were upheld. Chart audits for dysphagia screening percentages and rates of dysphagia diagnoses were only performed by the facility Neuroscience QI Data Analyst and ICU Charge RN, who were employed by the organization and possess a right-to-know. Stroke patients were

not used as project participants, therefore patient consent for participation was not needed, as dysphagia screening is regularly tracked by the organization for stroke measure congruence purposes. The basic ethical standards in nursing were upheld and these included patient autonomy, justice, and beneficence. This DNP QI project did not involve human subjects.

Procedure Implementation/Intervention

A letter of general support to create a QI project on acute stroke dysphagia screenings was obtained by the Critical Care Director (see Appendix H). The Neuroscience QI Data Analyst agreed to report the percentage of patients admitted to the ICU with acute stroke who received a nurse dysphagia screening pre- and post-project intervention, for a total of 8 weeks. Simultaneously, the ICU Charge RN agreed to perform chart audits to collect the rates of patients admitted to the ICU with acute stroke who were diagnosed with dysphagia, for the same 8 weeks. The DNP project lead presented all QI project details to key stakeholders for approvals and permission for use and included: an educational workshop encompassing the facility's dysphagia screening protocol with a digital case-based scenario, education on the BJH-SDS, plan to measure RN bedside stroke dysphagia screening documentation rates and rates of dysphagia diagnoses, and plan to measure nursing self-efficacy. The QI Project Proposal form was submitted for approval from the organization's Nursing Quality Oversight Research Team (NQORT). Once all project details were approved, the DNP team and key stakeholders were informed of all details and tentative timelines via their individual organization email. Flyers to alert ICU RNs of the dysphagia screening educational workshop were distributed in common critical care staff areas 1 week before implementation. The project took place at 3 in-person critical care staff meetings and lasted approximately 15-20 minutes. A 10-item modified General Self-Efficacy Scale (GSES) survey was given to each nurse prior to the workshop presentation

and they were asked to address items 1-9. A number was assigned to each survey; numbers were used to ensure nurse anonymity and to ensure proper pairing of pre- and post-intervention surveys during data analysis. The DNP student created an educational PowerPoint by using materials from the BJH-SDS protocol and included information from the organization's established dysphagia screening documents. The case-based scenario (Appendix I) was created based on problem verbiage from the ICU Charge RN and ICU RN Educator, and was added to the PowerPoint. The case-based scenario question/answer was conducted as guided discussion. Immediately following the workshop, the 10th item on the modified GSES was completed by each nurse. At the completion of the total data collection period, each participant was asked to address items 1-9 of the modified GSES for a second time. The above data was collected by the DNP project lead and a codebook was created in Microsoft Excel to document all responses from the GSES, rates of nurse dysphagia screenings, and dysphagia diagnoses pre- and post-intervention. No identifying patient data were used. If the weekly nurse dysphagia screening percentages post-intervention were consecutively >=95%, the DNP project would be deemed successful. A budget addressing the physical supplies needed, the cost of staff time throughout the project, and possible losses and/or gains in hospital revenue was developed (see Appendix J).

Measures

Demographics

Demographic information was collected at the start of each educational workshop session. Nurse demographics were collected on the second page of the modified GSES questionnaire. This information was collected from the nurses who agreed to participate in the project and met the project inclusion criteria. The demographic information included the following: total amount of time employed as an RN, amount of time employed at the

organization, employed on day shift or night shift, travel nurse or staff nurse, and the length of their ICU orientation at the project organization.

Dysphagia Screening

The BJH-SDS was developed in 2006 in a stroke unit at Barnes-Jewish Hospital in St. Louis, Missouri, (Edmiaston et al., 2014) and is currently used nationally by many health care organizations. Prior to the development of this nursing bedside dysphagia screen, SLP's at Barnes-Jewish Hospital were required to assess for dysphagia in every patient with acute stroke. This created too large of a patient load for SLPs and was determined that it was also too time consuming. It was found that the amount of time that patients were being kept NPO was unnecessary, so the BJH-SDS (Appendix K) was developed as a quick bedside screening that nurses could be trained to perform, and ultimately allowed for more rapid and efficient identification of dysphagia in patients with acute stroke (Edmiaston et al., 2014). Evidence-based literature on the BJH-SDS has demonstrated high sensitivity and moderate specificity to detect dysphagia (Edmiaston et al., 2014). It is considered a reliable and valid nurse bedside dysphagia screening tool (Edmiaston et al., 2014). The BJH-SDS is the only nurse dysphagia screening instrument approved for use within the DNP project organization. If a patient requires a more thorough and advanced dysphagia screening assessment, SLPs may conduct a Video Fluoroscopic Swallow Study (VFSS) under real time x-ray vision, and this study is considered the gold-standard of dysphagia screenings (Edmiaston et al., 2014; American Speech-Language-Hearing Association, 2023). When the BJH-SDS was compared to VFSS, its' sensitivity to detect dysphagia was 94% (95% CI, 88%-98%), and its' sensitivity to detect aspiration was 95% (95% CI, 85%-99%) (Edmiaston et al., 2014). The specificity to detect dysphagia was 66%

(95% CI, 57-75%), and its' specificity to detect aspiration was 50% (95% CI, 42%-58%) (Edmiaston et al., 2014).

The DNP project lead obtained weekly nurse dysphagia screening rates from the Stroke QI Data Analyst, who performed chart audits on all patients with stroke admitted to the ICU for four weeks, pre- and post-intervention. Since the Stroke QI Data Analyst tracks this data regularly for the organization, little instruction from the DNP project lead was required. It is important to note that patients admitted to ICU with acute intracerebral hemorrhages following a traumatic event were not considered as part of this data collection. Chart audits consisted of review of documentation and use of the BJH-SDS, in less than 24 hours of ICU admission.

General Self-Efficacy Scale

The GSES is a 10-item scale that was created in Germany by Ralf Schwarzer and Matthias Jerusalem in 1993. It was developed to measure Albert Bandura's self-efficacy theory (1977), which relates successful performances of individual tasks to a person's attitudes, life experiences, and beliefs. The GSES was developed to "assess the strength of an individual's belief in his or her own ability to respond to novel or difficult situations" (Schwarzer & Jerusalem, 1993) and a person's ability to deal with any associated barriers. The scale is quick and can be self-administered. It requires an individual to respond on a Likert-scale, ranging from 1 to 4; 1 is "not at all true" through 4 "exactly true" to what degree the individual feels the sentence or statement applies to themselves in relation to their self-efficacy. Historically, the items are added as a sum, producing total scores that could range between 10 and 40. Greater totals suggest a more advanced degree of the individual's perceived self-efficacy. When measuring total sums, GSES psychometric analyses found high internal consistency ratings

(alpha 0.82-0.93) (Schwarzer & Jerusalem, 1993). In 991 people, retest reliability was 0.47 (men) and 0.62 (women) (Schwarzer & Jerusalem, 1993).

It should be noted that the GSES has been widely used within the nursing profession and in studies across hospitals and public healthcare centers to measure various aspects of nurse self-efficacy (Kalandyk et al., 2016). The GSES has also been used in other healthcare domains, such as in patient perceived self-efficacy to adhere to medical recommendations, and to measure the promotion of patient health behaviors in various acute and chronic disease states (Luszczynska et al., 2005). In student academics, Diabetes Mellitus and Parkinson's research, several studies were found where individual GSES items were analyzed and compared. In many studies, exploratory and confirmatory factor analyses (Hurst et al., 2022; Kim et al., 2023; Nilsson et al., 2015; Zeng et al., 2020; Wu et al., 2009) were used to assist in explaining individual item relationships with specific domains, total variance and structural validity. When analyzing GSES items individually, some studies have reported good psychometric properties, reliability and validity (Hurst et al., 2022; Kim et al., 2023; Nilsson et al., 2015; Zeng et al., 2020; Juarez & Contreras, 2008; Wu et al., 2009). In a recent, large multicenter study that measured patient self-efficacy in their own diabetes management, single item measurement was the most appropriate fit to the data by parallel analysis ($p < .001$) with Cronbach's alpha 0.87 (95% CI 0.86-0.88) (Hurst et al., 2022). Some research studies across the globe deem the GSES a unidimensional structure (Schwarzer & Jerusalem, 1993; Juarez & Contreras, 2008), however, some studies argue that it also contains multidimensional properties with individual item functionality (Zhou et al., 2016; Barahona et al; 2018). Thus, the DNP project lead chose to include individual item analyses for consideration and discussion.

The approval for permission to use and to modify Schwarzer & Jerusalem's GSES for this DNP project was obtained (see Appendix L). A copy of the original GSES can be seen in (Appendix M) but was modified by the DNP project lead to address nursing self-efficacy related to screening stroke patients for dysphagia (see Appendix N).

Dysphagia Diagnosis

The ICU Charge RN collected dysphagia diagnosis rates in patients with acute stroke and reported them to the DNP project lead. Data was collected for each stroke patient admitted to the ICU weekly for four weeks, both pre- and post-intervention. The ICU Charge RN was educated on how dysphagia diagnoses would be identified in the EHR during chart audits. A diagnosis of dysphagia in the ICU could contain any combination of; documentation of an acute dysphagia diagnosis in the EHR by any physician or advanced practice provider; any patient initiated on a modified diet prescribed by SLP; and any initiation of tube feeding via dobhoff. Patients with known chronic dysphagia diagnosed before their ICU admission and patients with traumatic intracerebral hemorrhage were excluded.

Data Analysis

Data were analyzed by the most recent version of the IBM SPSS 29 statistical software. All data were collected pre- and post-intervention. The educational workshop was the independent variable. The dependent variable consisted of dysphagia screenings and dysphagia diagnoses. An excel spread sheet was created by the DNP project lead to keep track of all data in a locked computer with approved firewall protections.

Demographics

Descriptive statistics were used to analyze nurse demographics. Results were analyzed and reported as proportions.

Dysphagia Screening

The documentation of the BJH-SDS was collected from the Stroke QI Data Analyst on a weekly basis. The rate was collected as a percentage for each week. Results were reported as proportions weekly for 4-weeks pre- and post-intervention.

General Self-Efficacy Scale

Each participant's GSES survey was numbered, and each nurse kept the same number when completing the surveys during duration of the 8-week data collection period. Total scores of the GSES (items 1-9) were calculated for each participant, both pre- and post-intervention. First, a paired *t*-test was used to determine the mean difference of total scores between pre- and post-intervention. The mean differences were compared, and the level of significance was set at $p < 0.05$.

Item 10 contained a separate question, and the nurse was expected to respond on the same Likert-scale: The case-based scenario at the end of the PowerPoint presentation helped me to apply my learning about dysphagia screening to real-life. When analyzing item 10 of the GSES, mean and standard deviation were used to determine the total mean response.

Second, a separate paired *t*-test was used to analyze each individual item (1-9) of the GSES for each nurse, to assess mean individual changes, pre- and post-intervention. Individual mean differences were compared, and the level of significance was set at $p < 0.05$. Items that were statistically significant were included for the purpose of capturing additional useful information to aid this QI project. Exploratory and confirmatory factor analyses, total variance, and structural reliability and validity were not performed.

Dysphagia Diagnosis

The dysphagia diagnosis rate was collected each week. Results were reported as proportions weekly for 4-weeks pre- and post-intervention.

Outcomes

A group of short-term, intermediate, and long-term measurable outcomes were developed, as well as a timeline for project preparation and implementation which is shown on the GANTT chart (see Appendix O). The collection of short-term goals for project implementation were as listed; to evaluate RN competency related to application of the BJH-SDS performance and documentation, for all ICU RNs to attend the educational workshop on the BJH-SDS and participate in the case-based study, and for all ICU RNs to complete the pre- and post-intervention GSES survey. Two intermediate goals were developed. One was to develop an increase in RN application of the BJH-SDS process, and the second was to increase RN self-efficacy to complete dysphagia screenings. Three long-term goals were developed. Post-project implementation, the priority goal was for acute stroke dysphagia screening and documentation to reach >=95% for 4 weeks post-project. The second goal was to identify dysphagia diagnoses in acute stroke patients. The final long-term goal was to increase overall patient safety and mortality through improved nursing self-efficacy to perform dysphagia screenings. The logic model is a graphic relationship between the DNP program situation, resources, activities, external factors, assumptions, and the proposed project outcomes desired (see Appendix P*)*. The project and related outcomes were considered feasible and sustainable to the organization.

Results

Demographic Data

A total of 15 ICU nurses participated in this quality improvement project and there were no participants lost to follow up. Years of experience demonstrated that 46.7% of the

participants reported 0-5 years; 13.3% of participants reported 6-10 years of total nursing experience; 20% of participants reported 11-15 years of nursing experience; 20% reported they had 16-20 years of total nursing experience. There were 46.7% participants employed in BHL's ICU for 1-3 years. The rest of the participants time employed in BHL's ICU were as follows: 26.7% of participants employed <1 year, 13% employed 3-5 years, 6.7% employed 6-8 years, and 6.7% employed 9-20 years. Over half of the participants, 53.3%, were employed as travel nurses; 46.7% were employed as staff nurses. Most nurses, 60%, worked on day shift and the other 40% worked night shift. The length of ICU nursing orientation at BHL demonstrated: 40% 1-2 days, 26.7% 6-8 weeks, 13.3% 10-12 weeks, and 3% >12 weeks. There were no missing demographic data. Appendix Q illustrates demographic results.

Dysphagia Screening

Pre-intervention data included weeks 1-4 and post-intervention data included weeks 5-8. Nursing dysphagia screenings were performed and documented 100% of the time in weeks 1-4. The remaining weeks 6-8 of the post-intervention dysphagia screenings were also 100%, apart from week 5 which was 90%.

General Self-Efficacy Scale

All participants completed the modified GSES, both pre- and post-intervention. The first paired *t*-test was conducted to assess mean differences in the GSES total scores. A statistically significant difference ($p \leq 0.001$) was found in the participant's GSES scores (MD=-3.20, $p = .001$) from pre- to post-intervention (see Appendix R).

A second paired *t*-test was conducted for each item 1-9 of the GSES to assess individual item mean score comparisons. Statistically significant differences ($p \leq 0.05$) were found in individual item mean scores of the modified GSES. There were 6 out of the 9 GSES items

deemed statistically significant; Item 1 asked about the nurses' ability to solve difficult problems while caring for patients with stroke in ICU (MD= -0.26, p = .041); Item 2 asked how easy it was to perform and document a dysphagia screening immediately upon a stroke patients' admission to the ICU (MD= -0.26, p = .041); Item 3 asked how confident the nurse was at dealing quickly and efficiently with unexpected patient aspiration events (MD= -0.40, p = .009); Item 7 asked how aware the nurse was of methods that will prevent malnutrition while caring for patients with stroke (MD= -0.40, p = .028); Item 9 asked the nurse if ensuring a bedside dysphagia screening was performed and documented was a top priority, even if they were having a busy day (MD= -0.46, p = .014). A statistically significant difference ($p \leq .001$) was also found for Item 4, which asked how well the nurse handled unforeseen situations in patients with difficulty swallowing and if they know where to find dysphagia screening resources in the ICU (MD= -0.80, p = .001). Item 10 asked how well the digital case-based scenario at the end of the education workshop helped apply their learning about dysphagia screening to real-life situations in the ICU ($M=3.93 \pm 0.25$). For item 10, there were 14 participants who answered 4 (Exactly true) except for 1 participant who answered 3 (Moderately true). The item 10 data set was not normally distributed, but variability from the average was low. When considering the mean and variability, item 10 can be determined statistically significant. A results table was developed for the individual item paired *t*-test analyses (see Appendix S).

Dysphagia Diagnosis

There were 46 patients admitted to the ICU with acute stroke during the data collection period, and 3 patients were excluded for chronic dysphagia, which made the final total 43 patients. Of the 43 patients who were screened correctly during the pre-and post-intervention,

dysphagia was diagnosed; 33% in Week 1; 33% in Week 2; None in Week 3; 75% in Week 4; 45% in Week 5; 67% in Week 6; 67% in Week 7; and 67% in Week 8.

Discussion

Demographics

Most nurses who participated in the DNP project had between 0-5 years total experience and employed in the organization's ICU for 1-3 years. Overall, 40% had between 0-5 years of total experience. Most of the participants were travel nurses (53.3%). The organization has been able to address critical nursing shortages since the beginning of the COVID-19 pandemic, especially within the ICU, by hiring travel nurses. Travel nurses possess temporary employment, and consistent resources available to them on the unit can be vital for establishing knowledge of policies, such as dysphagia screening (Tuttas, 2015). Thus, re-education of dysphagia screening procedures, protocols, and documentation requirements may be helpful for all nurses, no matter the years of experience or time with the organization.

Dysphagia Screening

Weeks 1-4 (pre-intervention) demonstrated that nurse application, performance, and documentation of dysphagia screenings in patients with acute stroke admitted to ICU within 24 hours was 100% each week. Week 5, immediately post-intervention, demonstrated nursing performance and documentation of dysphagia screenings were 90%. Results for each week, Weeks 6-8 (post-intervention) were also 100%. According to the QI Data Analyst, a missed screening was found in Week 5 when the nurse documented oral medications were given before a dysphagia screening was completed. The DNP project specific aim of improving nurse application, performance, and documentation rates of the BJH-SDS in acute stroke patients

to >95% over 4 consecutive weeks post-intervention was not consistently met, although, the 90% of nursing dysphagia screenings performed in Week 5 exceeded the facility goal of >85%.

General Self-Efficacy Scale

When analyzing the modified GSES total scores pre- and post-intervention, it was determined that the majority of RN perceived self-efficacy to screen for dysphagia improved post-intervention.

When analyzing the modified GSES individual items, 7 of the items returned statistically significant results. Participants demonstrated a positive affect post-intervention in the mean difference of individual GSES items. Nurse self-efficacy regarding problem-solving abilities when caring for patients with stroke, as well as their ability to handle unforeseen situations in patients with dysphagia improved. These findings are congruent with the literature, which suggests that the ability of a nurse to think critically to meet patient needs can positively impact patient care (Benner et al., 2008). Participants demonstrated feelings of increased confidence post-intervention in management of dysphagia and unexpected aspiration events in patients with acute stroke.

According to Benner et al. 2008, the ability of nurses to consider alternatives when attempting to meet patient needs will result in higher-quality care. An increase in the nurse's ability to find dysphagia screening resources within the ICU was also observed post-intervention, verifying that the availability and knowledge of where to find resources can undoubtedly influence nurses' clinical decision making (Benner et al., 2008). Post-intervention, participants demonstrated increased motivation to ensure a bedside dysphagia screening is performed and documented during a busy day, as well as increased motivation to perform and document a dysphagia screening immediately upon a stroke patient admission to ICU. The ability of a nurse

to accomplish tasks successfully has been demonstrated to positively influence their perception of self-efficacy (Kalandyk et al., 2016). The total scores, along with many individual item mean differences were statistically significant. Thus, the specific project aim of improving nursing self-efficacy to screen for dysphagia was met.

A digital case-based scenario discussion and answer session was conducted during the DNP intervention. Item 10 of the GSES asked the participant how well the case-based scenario helped them to apply their learning about dysphagia screening to real-life situations they may encounter in the ICU. The results were statistically significant. Thus, the digital case- based scenario was effective in improving nursing self-efficacy, knowledge, and was deemed beneficial to nursing staff in this DNP project.

Dysphagia Diagnosis

Overall, between weeks 1-4 (pre-intervention) 40% of patients with acute stroke were admitted to ICU and diagnosed with dysphagia. Between weeks 5-8 (post-intervention), 63% of patients with stroke were diagnosed with dysphagia. Although nursing dysphagia screening rates in Week 5 did not meet the DNP student goal, more patients were diagnosed with dysphagia collectively post-intervention. The increase in patients who received dysphagia screening indicates that more patients were captured during monitoring of the diagnosis rates. The specific aim of monitoring rates of dysphagia diagnoses in patients with acute stroke was met.

Limitations

There were 15 nurse participants; roughly less than half of the total nurses who work in the ICU. Although staff meetings are considered mandatory for all ICU nurses, the number in attendance was small. A total of 26 staff members, including CCU RNs, CNAs, and monitor techs were in attendance.

The total of 8 weeks of data collection could also be considered a limitation and expanding the length of the data collection period could have made a stronger impact on results. One specific limitation mentioned by the facility QI Data Analyst was that during the DNP project data collection period, the organization experienced a disproportionately low number of acute stroke admissions hospital-wide when compared historically to past numbers of admissions, thus a lesser number of patients admitted to ICU. Self-report bias of the modified GSES survey was also a limitation and anonymity were instituted to reduce report bias.

The modified GSES has been validated using total sum score. In addition to the total sum score data analysis, the needs assessment of the organization supported individual item score analysis although individual item use has not demonstrated reliability and validity. Nonetheless, additional information was captured that was beneficial to report to the organization. In the future, benefits could be derived from performing exploratory and confirmatory factor analyses, measuring variance, determining scale dimensionality, and its reliability and validity when used in acute stroke dysphagia management.

Conclusions

The purpose of the DNP project was to examine the impact of an of educational program on stroke nurse dysphagia screening rates and improvement in nursing self-efficacy to complete dysphagia screening. The implementation of in-person, educational workshops with case-based scenarios would be sustainable to individual hospital units and the organization due to the ease and lack of expense to conduct. Implementing an intervention like the one in this DNP project may help remedy issues with staff ability to meet other clinical performance standards in the future. Improving nursing self-efficacy in executing dysphagia screenings will improve patient outcomes which contributes to decreased hospital costs.

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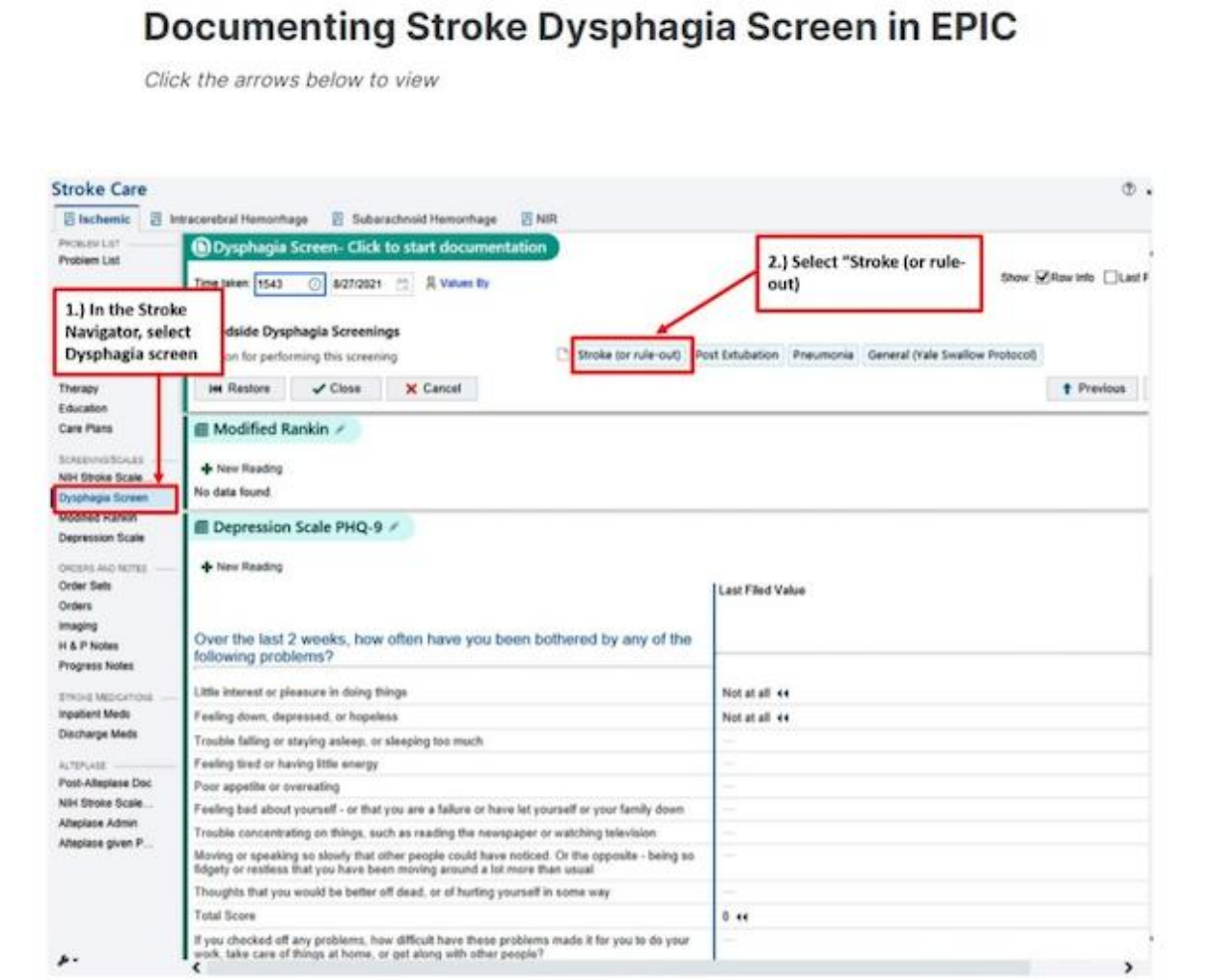
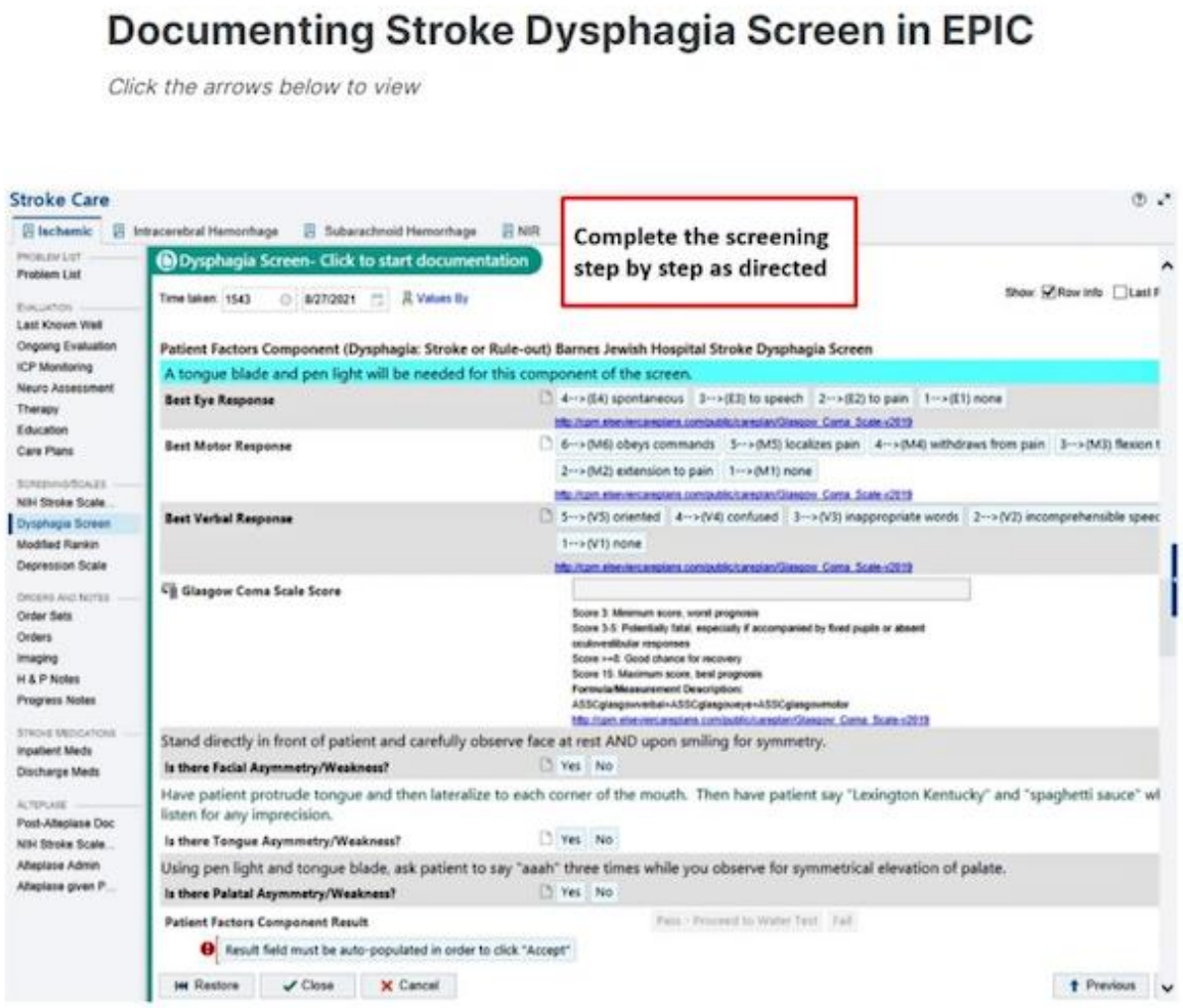
Appendix A



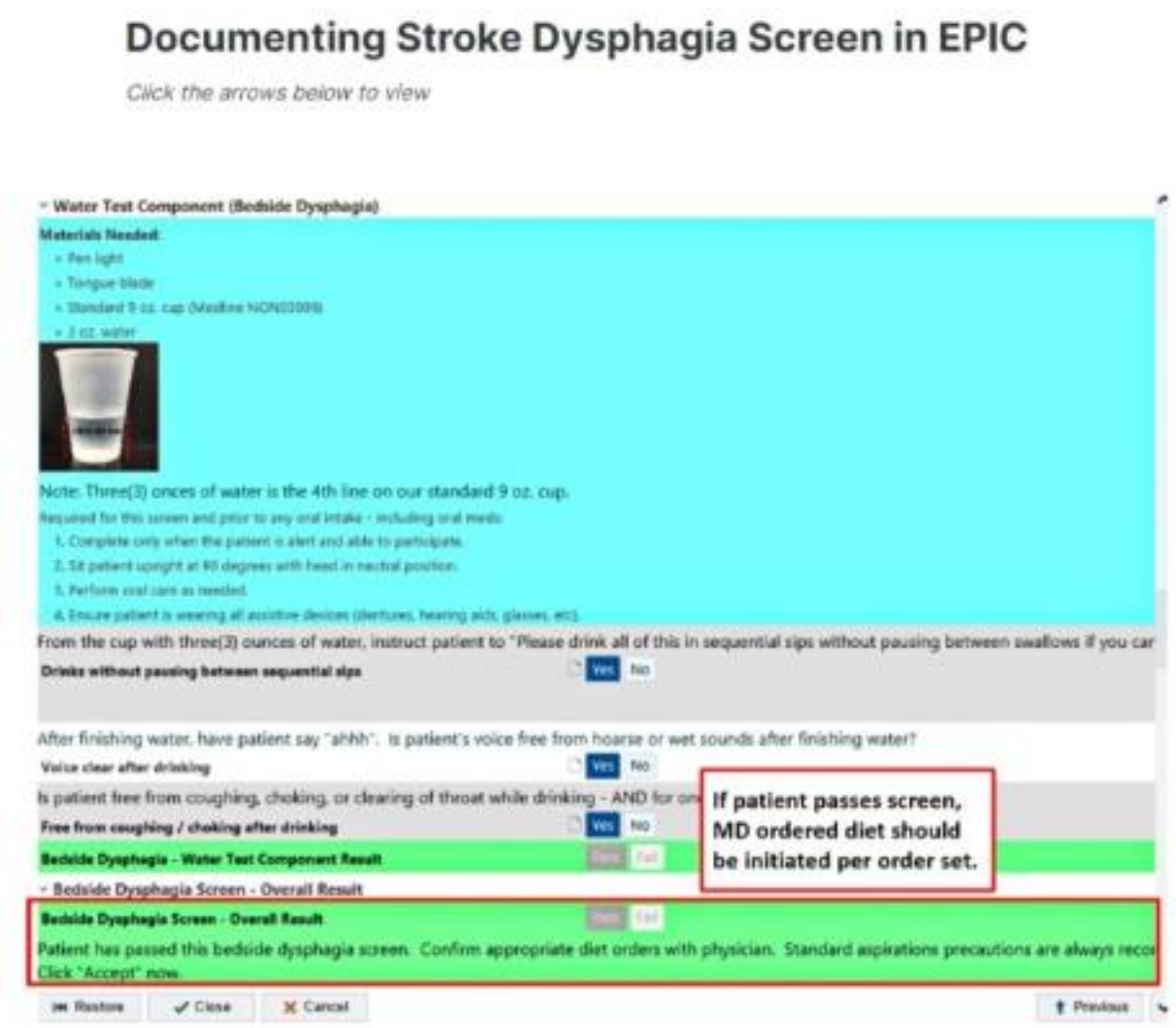
Appendix A. Organization Stroke Navigator. Stroke (or rule-out). (2022).

Appendix B



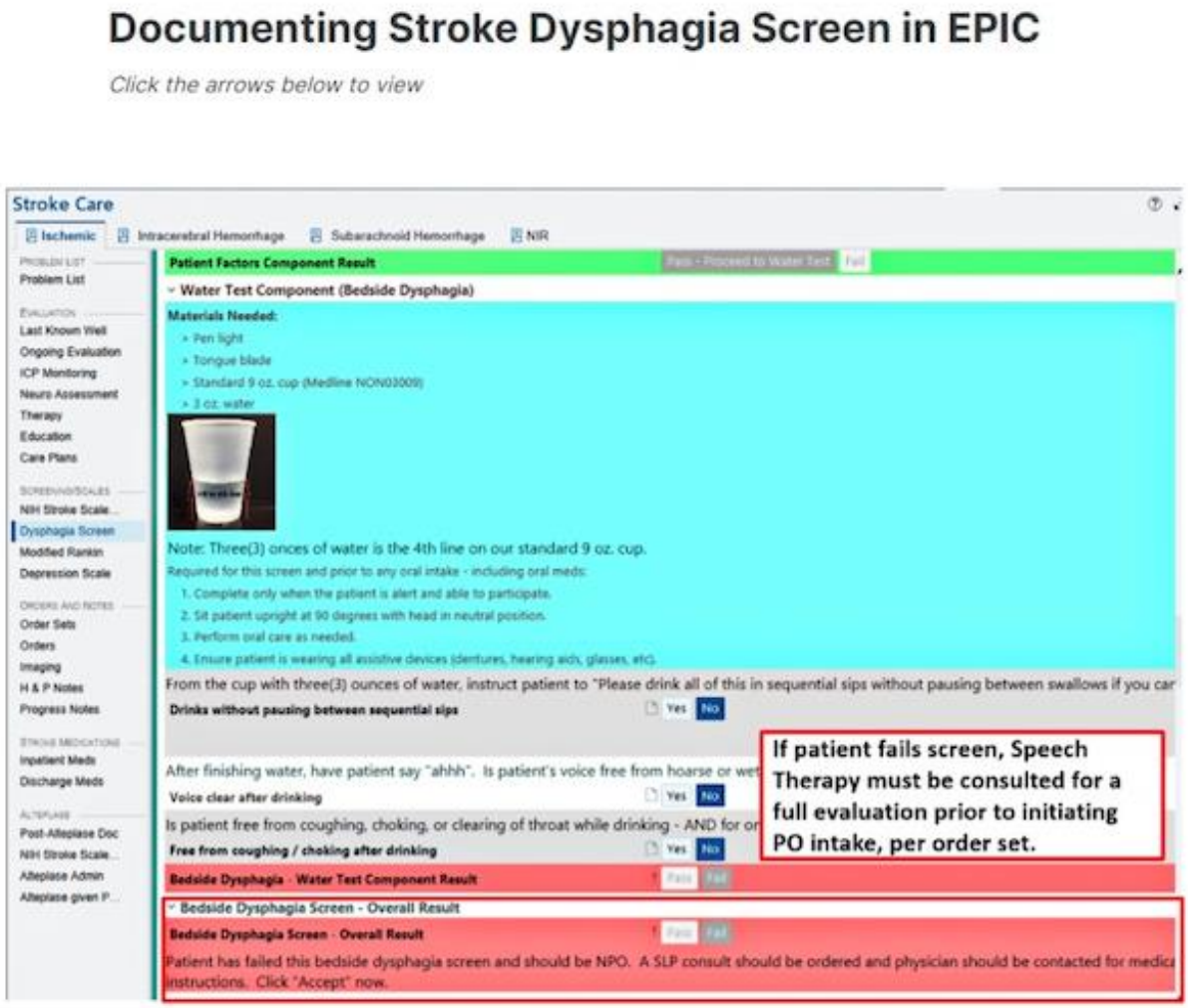
Appendix B. Organization Bedside Stroke Dysphagia Screen. Patient Factors Component (Dysphagia: Stroke or Rule-out) Barnes Jewish Hospital Stroke Dysphagia Screen. Glasgow Coma Scale (2022).

Appendix C



Appendix C. Organization Bedside Stroke Dysphagia Screen. Water Test Component (Bedside Dysphagia Screen Pass). (2022).

Appendix D



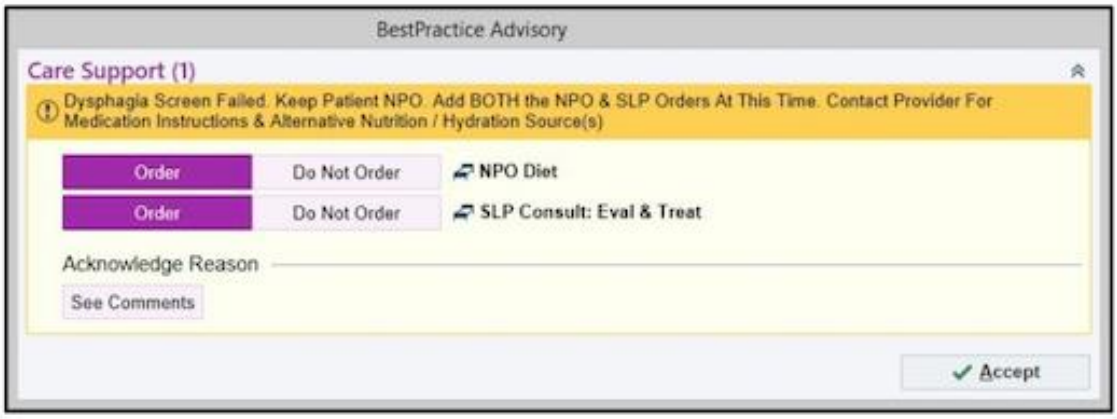
Appendix D. Organization Bedside Stroke Dysphagia Screen. Water Test Component (Bedside Dysphagia Screen Fail) (2022).

Appendix E

Stroke Dysphagia Screening

There are several BPAs the user could receive based on previous orders
Review and follow directions provided by the BPA

The example below informs the user to keep the patient NPO, consult SLP and contact provider for medication and nutrition/ hydration sources

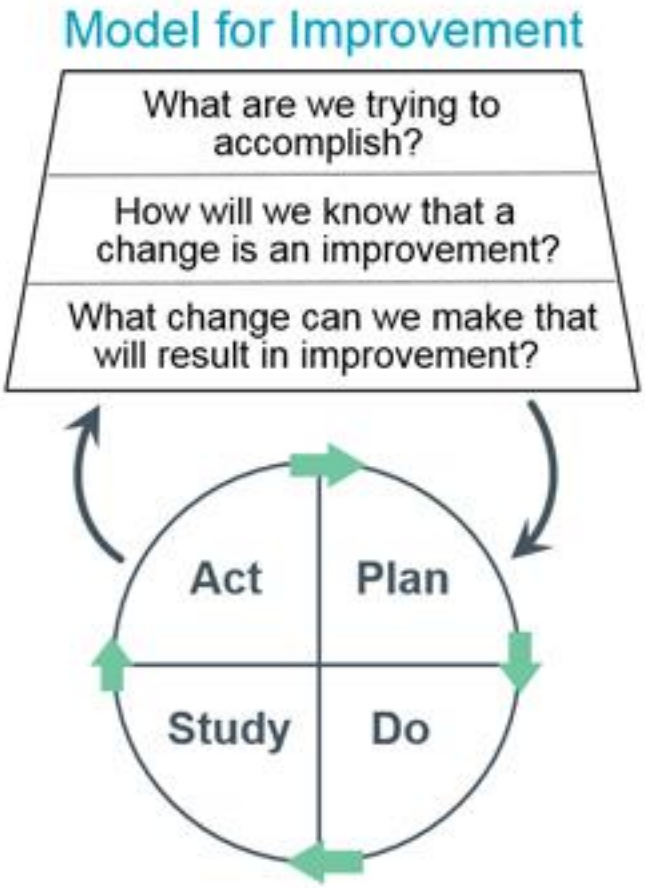


Appendix E. Organization Dysphagia Screen Fail, Best Practice Advisory. (2022).

Appendix F

Appendix F. Lopez-Garrido, G. (2023) Bandura's self-efficacy theory of motivation in psychology. How does self-efficacy develop? *Simply Scholar, LTD.* Retrieved from https://www.simplypsychology.org/self-efficacy.html

Appendix G



Appendix G. Institute for Health Care Improvement. (2022). Science of improvement: testing changes. Plan-Do-Study-Act (PDSA). Retrieved from https://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementTestingChanges.aspx

Appendix H

November 9, 2022

To whom it may concern:

RE: Letter of approval

The purpose of this letter is to inform you that I approve of Chelsea Bills' DNP project. It will focus on improving dysphagia screening and documentation in the acute stroke patient population in the ICU at

Respectfully,

April Clark

April Clark, BSN, RN, CNML

Director of Critical Care

Appendix H. Organization Letter of Approval from Director of Critical Care (2022).

Appendix I

Case-Based Scenario

A 72-year-old male patient is brought to the emergency department (ED) and diagnosed with an acute ischemic stroke which is confirmed by head CT. It is determined the patient must be admitted to the Intensive Care Unit (ICU) for hourly neurologic checks and close monitoring. An ICU bed becomes available, and the emergency room nurse calls report to the ICU nurse. Over the next 10 minutes, the patient begins to deteriorate and requires emergency intubation. The ED nurse calls the ICU with an update on the patient status, and the patient is transferred to the ICU once stabilized. In report, the ED nurse states she did not have time to perform or document a bedside dysphagia screening. 3 days later, the patient is successfully extubated. The ICU nurse uses the post-extubation dysphagia screening protocol. First, the nurse addresses the Patient Factors Component, and the patient receives a "pass-proceed to water test." The nurse then continues to the Water Test Component and determines that the patients' voice is unclear upon drinking three ounces of water, and the patient coughs several times. The nurse documents a "fail" on the Water Component part of the bedside dysphagia screening. The nurse ensures a Speech-Language Pathologist consult is entered into the patient EMR and makes the patient NPO.

What are the identified areas that need improvement in this scenario?
Would the documentation of dysphagia screening be sufficient for stroke core measures?

Areas for improvement/Areas for open discussion:

1. Since the patient is intubated upon admission to ICU, the dysphagia screen: stroke (or rule-out) should be documented as a "fail" within 24 hours.
2. The nurse used the post-extubation dysphagia screening protocol once the patient was extubated, but this is incorrect. The nurse must use the dysphagia screen: stroke (or rule-out). The post-extubation dysphagia screening is only used when patients who are not diagnosed with stroke are extubated.
3. In this case, nurse documentation in this scenario would not be considered compliant with the facility dysphagia screening for stroke core measures. A "fail" was not documented within 24 hours of admission to the facility, nor was a "fail" documented upon admission to the ICU.

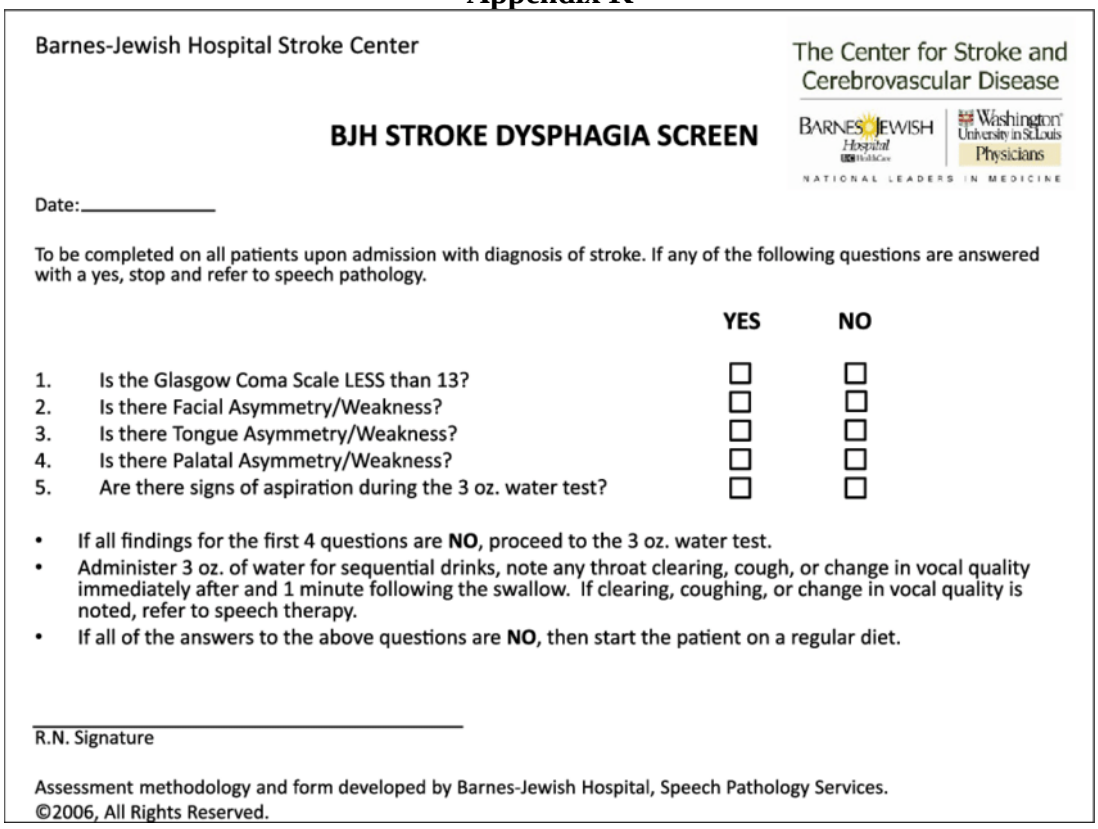
Appendix I. Case-based scenario with correct answers and areas for discussion.

Appendix J

	A	B	C	D
1	Physical Supplies Needed	Cost	Time (in hours)	Wage
2	Laptop (already owned by DNP student)	$600.00		
3	Projector (will ask to use the organizations')	$70.00		
4	Handouts (paper)	$10.00		
5				
6				
7	Total	$10.00		
8				
9	Staff			
10	DNP Student		330	
11	ICU Manager		2	$40.00/hr
12	Stroke QI Data Analyst		4	$35.00/hr
13	ICU RNs		1	$35.00/hr
14	ICU Educator		1	$35.00/hr
15	Total	$145.00		
16				
17				
18	Potential Loss In Revenue			
19	Hospital Acquired Pneumonia (HAP)	$27,000 per incidence		
20	Hospital Acquired Ventilator Associated Pneumonia (VAP)	$47,238 per incidence		
21				
22	Potential Gain in Revenue			
23	Decreased length of inpatient stay			
24	Decreased number of HAP, VAP			
25	Decrease in mortality and morbidity			
26	Increased patient and family satisfaction			

Appendix J. DNP Project Budget.

Appendix K



Barnes-Jewish Hospital Stroke Center

The Center for Stroke and Cerebrovascular Disease

BARNES-JEWISH Hospital | Washington University in St. Louis Physicians

NATIONAL LEADERS IN MEDICINE

BJH STROKE DYSPHAGIA SCREEN

Date:_____

To be completed on all patients upon admission with diagnosis of stroke. If any of the following questions are answered with a yes, stop and refer to speech pathology.

		YES	NO
1.	Is the Glasgow Coma Scale LESS than 13?	☐	☐
2.	Is there Facial Asymmetry/Weakness?	☐	☐
3.	Is there Tongue Asymmetry/Weakness?	☐	☐
4.	Is there Palatal Asymmetry/Weakness?	☐	☐
5.	Are there signs of aspiration during the 3 oz. water test?	☐	☐

- If all findings for the first 4 questions are **NO**, proceed to the 3 oz. water test.
- Administer 3 oz. of water for sequential drinks, note any throat clearing, cough, or change in vocal quality immediately after and 1 minute following the swallow. If clearing, coughing, or change in vocal quality is noted, refer to speech therapy.
- If all of the answers to the above questions are **NO**, then start the patient on a regular diet.

_____

R.N. Signature

Assessment methodology and form developed by Barnes-Jewish Hospital, Speech Pathology Services.

Appendix K. The BJH Stroke Dysphagia Screen. *From Validation of a dysphagia screening tool in acute patients with stroke* by Edmiaston, J., Connor, L. T., Loehr, L., Nassief, A. (2010). Retrieved from the American Journal of Critical Care: An Official Publication, *American Association of Critical-Care Nurses*, *19*(4), 357–64. https://doi.org/10.4037/ajcc2009961

Appendix L

Fachbereich Erziehungs-
wissenschaft und Psychologie
- Gesundheitspsychologie -
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Habelschwerdter Allee 45
14195 Berlin, Germany

Fax +49 30 838 55634
health@zedat.fu-berlin.de
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Freie Universität Berlin, Gesundheitspsychologie (PF 10),
Habelschwerdter Allee 45, 14195 Berlin, Germany

Permission granted

to use the General Self-Efficacy Scale for non-commercial reseach and development purposes. The scale may be shortened and/or modified to meet the particular requirements of the research context.

http://userpage.fu-berlin.de/~health/selfscal.htm

You may print an unlimited number of copies on paper for distribution to research participants. Or the scale may be used in online survey research if the user group is limited to certified users who enter the website with a password.

There is no permission to publish the scale in the Internet, or to print it in publications (except 1 sample item).

The source needs to be cited, the URL mentioned above as well as the book publication:

Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp.35-37). Windsor, UK: NFER-NELSON.

Professor Dr. Ralf Schwarzer
www.ralfschwarzer.de

Appendix L. Permission to use and modify the General Self-Efficacy Scale for non-commercial research

Appendix M

GENERALIZED SELF-EFFICACY SCALE

GL assess
the measure of

Name:.....

Date:..... **Record Number:** .....

		Not at all true	Barely true	Moderately true	Exactly true
1.	I can always manage to solve difficult problems if I try hard enough.	1	2	3	4
2.	If someone opposes me, I can find means and ways to get what I want.	1	2	3	4
3.	It is easy for me to stick to my aims and accomplish my goals.	1	2	3	4
4.	I am confident that I could deal efficiently with unexpected events.	1	2	3	4
5.	Thanks to my resourcefulness, I know how to handle unforeseen situations.	1	2	3	4
6.	I can solve most problems if I invest the necessary effort.	1	2	3	4
7.	I can remain calm when facing difficulties because I can rely on my coping abilities.	1	2	3	4
8.	When I am confronted with a problem, I can usually find several solutions.	1	2	3	4
9.	If I am in a bind, I can usually think of something to do.	1	2	3	4
10.	No matter what comes my way, I'm usually able to handle it.	1	2	3	4

Appendix M. Schwarzer, R., & Jerusalem, M. (1995). Generalized Self-Efficacy scale. In J. Weinman, S. Wright, & M. Johnston, *Measures in health psychology: A user's portfolio. Causal and control beliefs* (pp.35-37). Windsor, UK: NFER-NELSON.

http://userpage.fu-berlin.de/~health/selfscal.htm

Appendix N

Nurse General Self-Efficacy Survey

Survey # _____
Date _____

1. **I can always manage to solve difficult problems while working with stroke patients in ICU.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
2. **It is easy for me to perform and document a bedside dysphagia screening immediately when a stroke patient is admitted to ICU.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
3. **I am confident that I can deal quickly and efficiently with unexpected patient aspiration events.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
4. **I can handle unforeseen situations in patients with difficulty swallowing, and I know where to find dysphagia screening resources in the ICU.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
5. **I invest the necessary effort to properly comply with stroke core measures such as performing and documenting a bedside swallow screen.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
6. **I can remain calm when facing difficulties of caring for stroke patients because I can rely on my coping abilities.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
7. **When I am caring for a patient with dysphagia, I am aware of methods that will prevent malnutrition.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
8. **If previous nurses have not screened a patient for dysphagia, I take the initiative to perform and document the bedside screening.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
9. **Even if I am having a busy day, ensuring a bedside dysphagia screening has been performed and documented in stroke patients is a top priority.**
   Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)
10. **The case-based scenario at the end of the PowerPoint presentation helped me to apply my learning about dysphagia screening to real-life.**
    Not at all true (1) Barely true (2) Moderately true (3) Exactly true (4)

Appendix N (continued)

Nurse General Self-Efficacy Survey (continued)

Nurse Demographic Data

Please answer the questions below, your information will remain anonymous.

1. Total amount of time employed as an RN (specify number of months or years) _____
2. Total amount of time employed at this organization (days/months/years) _____
3. Are you regularly employed on day or night shift _____
4. Are you a travel RN/agency RN or a staff RN _____
5. What was the length of your ICU orientation (days/weeks/months) _____

(Page 2)

Appendix N. Modified General Self-Efficacy Survey with Demographic Measures.

Appendix O

	April '22	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan '23	Feb	March	April	May	June
Confer w/ key stakeholders to create project proposal ideas															
Write final proposal & revise drafts															
Submit final proposal; Submit QI form to BHL education for site approval															
Submit to IRB for approval															
Create virtual workshop															
Implement Project															
Collect Data & perform analysis															
Dissemination; Make QI project recommendation to facility															

~~**Appendix O.** GANTT Chart; Project Timeline~~

Appendix P

Improving Post-Stroke Dysphagia Screening in the ICU

Situation: Acute stroke dysphagia screening is inconsistently performed & documented in ICU; unit falls below facility goal of >=95% for multiple months per year in 2021

Inputs	Outputs		Outcomes -- Impact		
	Activities	*Participation*	*Short*	*Medium*	*Long*
Team: DNP student, neuroscience coordinator RNs, SLP, ICU educator RN, ICU manager, ICU Charge RN, Stroke QI Data Analyst DNP project chairperson Organization approval IRB approval	Pre-intervention GSES, post-intervention GSES PowerPoint with case-based scenario Stroke QI Data Analyst chart audits x 4 weeks for application and documentation of BJH-SDS dysphagia screening (pre & post) DNP student/ICU Charge RN chart audit on dysphagia diagnoses in acute stroke patients x 4 weeks (pre & post) Collect & analyze data using SPSS	Bedside ICU RNs Acute stroke patients	Evaluate RN competency to apply BJH-SDS performance and documentation For all ICU RNs to attend the in-person educational workshop and participate in case-based study & complete the GSES (if determined eligible and agree to participate)	To increase RN competency to apply the BJH-SDS and document To increase nurse-self efficacy through educational workshop & case-based study	Acute stroke dysphagia screenings in ICU are performed & documented =>95% post-intervention x 4 weeks Identify dysphagia diagnoses in acute stroke patients Increase patient safety & mortality through improved nursing self-efficacy to perform screenings

Assumptions
ICU RNs will attend educational session & agree to participate in project
RN educational session can be held in person at mandatory staff meetings
RN educational session will increase nursing dysphagia screening self-efficacy and documentation will reach >=95% post=project

External Factors
High RN staff turnover with short staffing common
Only 1 shift of ICU RN orientation for travel/agency nurses
Multiple patient needs/RN duties in a busy critical care unit
RNs may refuse to volunteer to be a part of the project & some may not be eligible to participate

Appendix P. Logic model; Improving Post-Stroke Dysphagia Screening in the ICU

Appendix Q

Nurse Demographic Descriptive Statistics

Variable	Frequency (N=15)	Percent (%)
Total Years of Experience as RN		
0-5 years	7	46.7%
6-10 years	2	13.3%
11-15 years	3	20%
16-20 years	3	20%
Total Years of Experience at BHL ICU		
< 1 year	4	26.7%
1-3 years	7	46.7%
3-5 years	2	13.3%
6-8 years	1	6.7%
9-20 years	1	6.7%
Staff or Travel/Agency Nurse		
Staff	7	46.7%
Travel/Agency	8	53.3%
Employed on Day/Night Shift		
Day Shift	9	60%
Night Shift	6	40%
Length of ICU Orientation		
1-2 days	6	40%
6-8 weeks	4	26.7%
10-12 weeks	2	13.3%
> 12 weeks	3	20%

Note. N = total amount of participants

Appendix R

Paired t-test comparison of General Self-Efficacy Scale Total Sums before and after Dysphagia Screening Education with case-based scenario (N=15)

Pair	(Mean Difference ± SD)	*t*	*df*	*p*	95% Confidence Interval Lower	95% Confidence Interval Upper
Total Sums of GSES pre- and post-intervention (N=15)	-3.20 (2.0)	-6.175	14	<.001***	-4.31	-2.08

Note. *** = $p \leq .001$. Standard deviations appear in parentheses below means

Appendix S

Paired t-test Comparison of General Self-Efficacy Scale Individual Item Scores Before and After Dysphagia Screening Education with case-based scenario (N=15)

Questionnaire Items	Pre-Intervention (Mean ± SD)	Post-Intervention (Mean ± SD)	*t*	*df*	Mean Difference	*p*	95% Confidence Interval Lower	95% Confidence Interval Upper
1. I can always manage to solve difficult problems while working with stroke patients in ICU.	3.13 (0.35)	3.40 (0.50)	-2.256	14	-0.26	.041*	-.52	-.01
2. It is easy for me to perform and document a bedside dysphagia screening immediately when a stroke patient is admitted to ICU.	3.40 (0.63)	3.66 (0.48)	-2.256	14	-0.26	.041*	-.52	-.01
3. I am confident that I can deal quickly and efficiently with unexpected patient aspiration events.	3.33 (0.61)	3.73 (0.45)	-3.055	14	-0.40	.009*	-.68	-.11
4. I can handle unforeseen situations in patients with difficulty swallowing, and I know where to find dysphagia screening resources in the ICU.	3.13 (0.74)	3.93 (0.25)	-.400	14	-0.80	.001***	-1.22	-.37
5. I invest the necessary effort to properly comply with stroke core measures such as performing and documenting a bedside swallow screen.	3.73 (0.45)	3.93 (0.25)	-1.38	14	-0.20	.189	-.51	.11
6. I can remain calm when facing difficulties of caring for stroke patients because I can rely on my coping abilities.	3.73 (0.45)	3.86 (0.35)	-1.0	14	-0.13	.334	-.41	.15

7. When I am caring for a patient with dysphagia, I am aware of methods that will prevent malnutrition.	3.53 (0.51)	3.93 (0.25)	-2.44	14	-0.40	.028*	-.75	-.04
8. If previous nurses have not screened a patient for dysphagia, I take the initiative to perform and document the bedside screening.	3.80 (0.41)	4.00 (0.00)	-1.8	14	-0.20	.082	-.42	.02
9. Even if I am having a busy day, ensuring a bedside dysphagia screening has been performed and documented in stroke patients is a top priority.	3.53 (0.63)	4.00 (0.00)	-2.8	14	-0.46	.014*	-.82	-.11

Note. * = $p \leq 0.05$, *** = $p \leq .001$. Standard deviations appear in parentheses below means.