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An Online Self-Directed Learning Module for Regional Stroke Survey Success

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TABLE OF CONTENTS

Abstract

The lack of a standardized education for stroke coordinators focusing on The Joint Commission (TJC) standards and requirements in preparation for the stroke program disease-specific care (DSC) certification survey every two years has led to undue added stress prior to survey. The development of tools and resources has been identified to address the current educational gap in stroke coordinator orientation. This project addressed the gap by creating an online, self-directed learning module to assist the stroke coordinators in knowledge acquisition of the stroke standards and requirements.

A stroke coordinator plays a critical role in stroke care delivery. An educational module made available to the 21 medical centers ensured standardized content information to provide effective and safe patient care by the interdisciplinary team. An innovative teaching method, such as self-directed modules, has emerged as an alternative approach to deliver education. Adult learners are self-directed and take initiative for their learning. Online, self-directed learning modules are effective ways to promote active, independent learning and still meet the learning goals and objectives. This evidence-based project demonstrated a 20% increase in knowledge score of the stroke standards and requirements. It also promoted consistency for learning to decrease variation in survey completion success.

Keywords: *self-learning module, online module, e-learning, nurse, knowledge, training*

Section II: Introduction

Problem Description

Stroke is considered one of the common causes of functional impairment and disability (Hickey & Livesay, 2016). With advanced treatment, focus on clinical management, and preventative measures, the incident of stroke has declined significantly (Howard, 2016). Stroke coordinators have an important role in the management of stroke patients by ensuring that evidence-based care guidelines are followed, while partnering with the interdisciplinary team (Purvis, Kilkenny, Middleton, & Cadilhac, 2018).

In a healthcare system located in Alameda County, California, a stroke team is comprised of interdisciplinary members from the emergency department, laboratory, radiology services, pharmacy department, rehabilitation, and stroke unit. As ninety percent of stroke is ischemic in origin with intravenous alteplase as a proven effective treatment, the time to drug intervention is critical (Tong et al., 2018). Therefore, the treatment coordination among the team is critical to meet the door-to-needle time of less than 60 minutes.

The stroke coordinator is responsible for overseeing the coordination and management of the stroke program certification survey by The Joint Commission (TJC). Achievement of TJC stroke certification not only demonstrates organizational commitment to providing high quality but also creates a competitive financial advantage. The certification process includes a survey process measuring performance to national standards, clinical practice guidelines, and performance measures (TJC, 2019). An initial certification is awarded to the hospital after a complete assessment of the program, followed by a recertification survey every two years. A hospital seeks certification as it establishes a standardized approach to care and builds a center of

clinical excellence. The designation recognizes hospitals for providing excellent stroke care (TJC, 2019).

A challenge in the organization is providing adequate training support in the onboarding of new stroke coordinators. There is inconsistent training among the medical centers within the region due to the lack of standardized education. The orientation includes a handoff from the outgoing stroke coordinator, if the position is filled immediately; review of role expectations from the quality director; and an overview of the program from the regional stroke coordinator liaison. The onboarding process is limited to an initial competency checklist with a list of role and responsibilities, which must be reviewed and completed within 90-days of hire. The list serves as a guide that contains the frequency of the assignment and critical skills required to achieve them.

Historically, the stroke coordinator prioritizes workload based on deadlines established through multiple competing priorities of the medical center. As a result, the focus on survey preparation is typically deferred until the recertification year when TJC is expected to arrive. Consequently, the stroke coordinator is unable to adequately prepare the stroke team on certification expectations. This restricted preparation timeline poses a risk for loss of stroke center designation. Due to the identified educational need of stroke coordinators, the online self-directed learning module was developed and activated to expedite training on the recertification process, alleviating unnecessary stress and improving certification survey performance.

PICO(T) Question

Can an online self-directed learning module improve stroke coordinator knowledge scores in preparation for TJC certification stroke survey, as compared to those who have not received an online self-directed learning module, over a period of four weeks?

Available Knowledge

A systematic methodology guided by the PICO(T) question was completed using the following main topics and key terms*: self-learning module*, online module*, e-learning, nurse*, knowledge,* and *training*. Databases CINAHL, PubMed, OVID, and Scopus were searched for applicable publications. The search yielded 68 journal articles. The abstracts were reviewed for inclusion and exclusion criteria. The full text was reviewed when it met the study criteria, which was written in English, quantitative or qualitative study, published within five years, and addressed the outcome benefits of the self-learning module. Excluded publications were editorials, narrative reviews, written in non-English, and non-medical related studies. Twenty (20) strongest and most relevant studies were reviewed to answer the PICO(T) question (see Appendix A). The evidence was analyzed using the Johns Hopkins Research and Non-Research Evidence Appraisal tools (Dearholt & Dang, 2018). The articles were further analyzed and selected if they were of good or high quality. The outcomes of the literature review were categorized into knowledge acquisition, clinical competency, confidence, and satisfaction of the online self-directed learning module (see Appendix B).

Knowledge Acquisition

Five randomized studies designed creative ways to enhance the effectiveness of online modules (da Costa Vieria et al., 2017; Gillan et al., 2018; Karvinen et al., 2017; Rahmati et al., 2018; Warner et al., 2019). One study evaluated the use of mobile phones in providing educational materials that can be accessed at any time (Rahmati et al., 2018). Rahmati et al. (2018) found that e-learning had a positive effect on the midwives' knowledge acquisition of preeclampsia and eclampsia management. Warner et al. (2019) used an adaptive design, which the learners had the option of not watching the complementary material, if the question was

answered correctly. The results showed knowledge efficiency or the time spent in a module section was significantly higher (95% 0.03, 0.14, $p = 0.004$). However, the level of adaptive design did not affect the knowledge score (Warner et al., 2019). A simulation model using low- and high-fidelity modules was another way to improve learning (Gillan et al., 2018). The low-fidelity materials were presented in slides and reading content, while the high-fidelity content included videos, images, and assessment of knowledge and decision-making slides. In the Gillan et al. (2018) study, the high-fidelity intervention showed a more significant impact on knowledge acquisition (56% pre-test vs. 70% post-test, $p = 0.02$). Another idea was the use of a sequential teaching method, where both traditional format and e-learning modules were sequentially presented to the learners (da Costa et al., 2017). The study found significant knowledge improvement ($p < 0.001$) between pre-test (average grade 44.6%) to post-test (average grade 73.9%), regardless of the teaching format (da Costa et al., 2017). Alternatively, a design to enhance the content module included the social cognitive theory framework, which focuses on changing behavior. Although there was no statistical significance in knowledge, the overall change favored the module (Karvinen et al., 2017).

In contrast, the quasi-experimental and mixed-method studies included in the review evaluated various learning modules in different disciplines. Significant improvement in knowledge was reported in all studies (Boet et al., 2017; Elkin et al., 2018; Ens et al., 2017; Gagnon et al., 2015; Goff et al., 2018; Kennedy et al., 2019; Parsons et al., 2019; Rafferty et al., 2019). An evaluation of nursing students, using an online self-directed module on scientific literature, demonstrated an improved knowledge for all the modules, except for the module that was considered to be the most challenging (Gagnon et al., 2015). A spirometry module, combined with an online interactive approach and a face-to-face component, was found to be

effective in educating nurses and medical professionals (Parsons et al., 2019). A self-directed acute HIV infection module in screening patients also showed a significant improvement in knowledge of clinical officers from pre-test to post-test assessment, with median pre-test score 35%, IQR 30%-45% vs median post-test score 75%, IQR 70%-85%, Wilcoxon signed rank test $p < 0.0001$ (Rafferty et al., 2019). In a study using an online cellular respiration module compared to a traditional lecture group, the students in the online learning group showed a higher normalized gain of knowledge of biology concepts, $t(437.77) = 7.15$, $p < 0.001$, $d = 0.59$ (Goff et al., 2018). Similarly, a celiac educational module with voice-over showed proven results for increasing the nurse practitioners' knowledge to improve prompt diagnosis (Elkin et al., 2018). A higher knowledge score was also reported of an online learning module to develop pubertal examination of medical residents (Ens et al., 2017). An evaluation of central venous catheter insertion with ultrasound guidance module also showed positive knowledge gain (Boet et al., 2017). Lastly, a self-assessment of medical students reported an increase in understanding of various clinical domains (Kennedy et al., 2019).

Two systematic reviews compared several studies and their impact on knowledge acquisition. One report found online program effectiveness with training nurse preceptors in their roles and responsibilities (Wu et al., 2018). Another article reviewed several studies on teaching methods of online and blended learning compared with a face-to-face platform (McCutcheon et al., 2014). Although the effects of these methods showed varied results, the majority of the studies reported a significant improvement in knowledge, which supported the online format as an effective teaching modality.

Clinical Competency

Seven studies evaluated the outcome measure of clinical competency (Boet et al., 2017;

Kennedy et al., 2019; McCutcheon et al., 2014; Smith et al., 2019; Tohidi, KarimiMoonaghi, Shayan, & Ahmadinia, 2019; Wentzell et al., 2018; Wu et al., 2018). A randomized study found that students' technical skill competency can be improved using an informal teaching method of a self-learning module (Tohidi et al., 2019). The material was presented in slides and video recordings, with supplementary materials, such as books and websites (Tohidi et al., 2019). Another randomized study evaluated self-directed training in comparison to a classroom setting (Smith et al., 2019). Both training groups were given similar educational content that would assist in polyp diagnosis using two classification systems. The intervention computer-based group (test group) received PowerPoint content, with the ability to stop the video for polyp assessment. The Smith et al. (2019) study showed that the self-directed computer training group was as effective as the classroom group (control group) in the accurate examination of polyps (SIMPLE classification 77.1% [95% CI 73.4-80.3] vs. 69.9% [95% CI 66.1-73.5%] $p < 0.005$ and NICE classification 77% [73.2%-80.4%] vs. 69.8% [95% CI 66-73.4%] $p = 0.006$). Additional studies also supported that technical skills and abilities can be acquired through the use of a module (Kennedy et al., 2019; Wu et al., 2018).

In comparison, a systematic review of online learning and blended learning format found that clinical skills using online learning varied among studies (McCutcheon et al., 2014). The results of online learning may be biased due to additional training interventions, and there was no specific time limit in accessing it (McCutcheon et al., 2014). No significant difference was found in the competency skill of physicians' insertion of central venous catheters (Boet et al., 2017). Similarly, the same finding was reported in the imaging diagnostic skill of medical students; however, a significant improvement was found in the overall performance skill with chest x-ray interpretation (Wentzell, 2018).

Confidence

Self-efficacy or confidence in preceptors' teaching skills and abilities varied among studies in a systematic review of online learning (Wu et al., 2018). There was an improvement in self-efficacy scores and confidence through the preceptorship program, while no significant change was found in other studies. Similar findings were reported in a study that online learning improved student confidence using computers, while others felt that this teaching method was stressful (McCutcheon et al., 2014). Limited interactive features of the module were also found to have contributed to the partial outcome (Warner et al., 2019). In contrast, some of the studies reported an improvement in confidence after reviewing a learning module (Elkin et al., 2018; Ens et al., 2017; Karvinen et al., 2017; Parsons et al., 2019; Wentzell et al., 2018). Although, one of the studies reported that it was difficult to determine if the increase in confidence was related to the additional practice performed by the participants (Wentzell et al., 2018).

Satisfaction

Convenience, flexibility, and unique online interaction are advantages favored by online module users (Wu et al., 2018). Increased leadership skills have been reported as positive outcomes (Wu et al., 2018), along with clinical and professional growth (Gagnon et al., 2015). A systematic review found that most users of online learning were satisfied with the alternative teaching format. However, the satisfaction of online format was inconclusive due to students' engagement and learning style variation, which may have affected the outcome (McCutcheon et al., 2014). A website that is user-friendly, simple, interactive, and structured increases a participant's engagement (Gagnon et al., 2015). However, drawbacks of an online platform include lack of instructor's engagement and interaction from other participants (Gillan et al., 2018).

Two qualitative studies provided critical viewpoints from the participants' experiences of self-learning format. Some of the benefits of an online module included the ability to access it anytime and anywhere, complete it at one's own speed, and repeat the content without time limitation (Gardner et al., 2016; Keis, Grab, Schneider, & Ochsner, 2017). E-learning was found to be interactive, with presentation of case studies, videos, and quizzes at the end of the module (Gardner et al., 2016). Lack of opportunity to ask questions, self-discipline, and time-consuming were cited as disadvantages (Keis et al., 2017).

In summary, studies revealed that the self-directed learning format had positive educational outcomes and could be utilized to improve stroke coordinators' knowledge. A self-directed learning format can achieve the teaching objectives similar to a conventional teaching method. Online training is a successful teaching modality, effective in educating staff with hectic schedules, such as stroke coordinators. Several benefits of self-training modules include accessibility, flexibility, self-paced, and ability to repeat and review the content, which can improve knowledge retention. This method of teaching was found to be beneficial in enhancing the knowledge of various learners, from new graduate nurses' clinical skills to diagnostic training of clinical providers. Based on the literature review, the evidence supports that online, self-directed learning modules can be utilized to improve the knowledge scores of stroke coordinators in preparation for TJC certification stroke survey (see Appendix A for Evaluation Table). The stroke coordinators can take advantage of these benefits, particularly with completing the online training module at any time due to ease of access and convenience.

Rationale

Based on the literature review and limitation of the studies, Malcolm Knowles's adult learning theory was used to guide the creation of the self-directed learning module. Knowles's

(1973) classic theory of adult learning incorporates experience and research. Knowles asserted that adult education should find new, creative ways to incentivize learning, further stating that adult learners were least likely to respond and be motivated to learn in a restrictive or authoritative way. Knowles, Swanson, and Holton (2005) cited *Informal Adult Education* by Knowles (1950), which supported the idea that "adults learn best in informal, comfortable, flexible, non-threatening settings" (p. 61).

Andragogy is a concept that adult learners are different from young learners or pedagogy. Andragogy refers to the adult education of a self-directed and autonomous learner, while pedagogy education is based on the authoritative instruction of children. Knowles (1973) explained that there is a need to find innovative ways in teaching and to understand that "education is learning, not teaching, and so our focus has started to shift from what the teacher does to what happens to the learners" (p. 52). The lag in education is due to the pedagogy style of learning, which is still applied in adult education. Hence, the principles of Knowles's andragogical model were applied to the stroke coordinator's role and learning development using an online self-directed module (see Appendix C). The six principles are (a) the need to know, (b) self-concept, (c) the learners' experiences, (d) readiness to learn, (e) orientation to learning, and (f) motivation (Knowles et al., 2005). Adults need to understand the relevance of investing in their learning. They are in charge of their education and recognize the need to be self-directed learners. As adult learners with problem-focused orientation, life experiences serve as a source of self-identity, and readiness to learn is based on timing and motivation.

Specific Aims

The project aim was to develop, implement, and evaluate a competency-based stroke coordinator program. A proactive regional approach for competency improvement of stroke

coordinators on the disease-specific care (DSC) standards. Enhanced knowledge was demonstrated by score improvement of the requirements, which led to better standard adherence and certification outcomes for the Northern California medical centers.

The main objectives included:

1. To develop a certification survey preparedness module for stroke coordinators that will be easily accessible on the intranet website of Northern California Stroke Program Information.
2. To increase the knowledge on the stroke certification standards and requirements, from pre-intervention score to 20% post-intervention score, by August 2020, among stroke coordinators within the Northern California region.
3. To increase the understanding of Survey Analysis for Evaluating Risk (SAFER) matrix by correctly placing a *Requirement for Improvement* (RFI) on the matrix tool, from pre-intervention score to 20% post-intervention score, by August 2020, among stroke coordinators within the Northern California region.

Section III. Methods

Context

The main critical stakeholders of the project were the regional stroke coordinator liaison and stroke coordinators. The integrated healthcare system located in Northern California is composed of 21 acute care medical centers, with a stroke coordinator who supports each stroke program. The stroke coordinator liaison oversees the program regionally, while the local stroke coordinator is responsible for the coordination and management of the stroke program in the medical center. The role and responsibilities are similar for all stroke coordinators. However, varied reporting structure and dedicated position equivalent (e.g., part-time or full-time) may differ by each hospital within the region.

Due to frequent stroke coordinator turnover and competing demands of the role, the regional stroke coordinator liaison, quality directors, and patient care services managers were open to an alternative training format. The leadership team supported local stroke coordinator preparation efforts toward a successful recertification survey. The initial assessment from the seasoned stroke coordinators confirmed the limited orientation focus on survey preparedness. Development of an online, self-directed learning module addressed the knowledge gaps for the local stroke coordinators pertaining to the certification standards and TJC survey requirements.

Intervention

The online, self-directed learning module included a survey preparation checklist and content of the TJC stroke standards and requirements. The regional stroke coordinator liaison was consulted to provide regulatory expertise and to guide the content development process. In addition, two seasoned stroke coordinators were interviewed for their expert opinion of the critical aspects of TJC stroke survey readiness. A short quiz at the end of each main topic was

developed to ensure participant engagement and knowledge attainment throughout the module. A final 10-item, multiple-choice test was included at the end of the module to test for knowledge acquisition. Although none of the participants failed the test, a remediation opportunity was provided for module review and re-testing. The training module was presented in a PowerPoint presentation, accompanied by supplementary resources, such as a clinical practice guideline, TJC DSC process guide, and other vital links for TJC stroke survey readiness. The self-learning module was distributed to the participants through email, and the assessments were completed using the Qualtrics (2020) software.

Gap Analysis

A gap analysis was performed to compare the current state against the desired state, including the next steps needed to close the gap (see Appendix D). The gap analysis identified the stroke coordinators' lack of formal training and limited exposure to TJC standards/ certification requirements. The primary knowledge gap was in the areas of data collection and quality performance measurement. Secondary knowledge deficits were within the stroke pathophysiology and importance of certification realms. Specific roles and responsibilities for stroke program management were also not consistently included in the stroke coordinator/quality nurse consultant orientation. As stroke coordinators have been reliant on the regional data abstractor, there was lack of knowledge on how quality measures were collected and submitted to regulatory agencies. With limited exposure on the requirements, creating a plan of correction on a survey deficiency was an area that required attention for training.

Gantt Chart

A Gantt chart is a useful tool to show the project start and end dates to ensure time has been allocated to perform the necessary activities (Martinelli & Milosevic, 2016). The project

was divided into four major categories: project assessment, module development, implementation, and data analysis and evaluation (see Appendix E). The project assessment started in January 2019, with a project completion of March 2020. The assessment included interviewing the medical center stroke coordinator and reviewing the current training tools and competency checklist. The feasibility of the project was discussed with the regional stroke coordinator, who was a key driver in introducing the module to the stroke coordinators. The module development was comprised of (a) interviewing the seasoned stroke coordinators for content ideas, (b) creating the checklist and knowledge check questions, and (c) requesting the regional stroke coordinator to review the appropriateness and accuracy of the questionnaire. Implementation involved communication to individual stroke coordinators regarding project purpose, demographic survey, and pre/post-test documents. Finally, the data analysis and evaluation included synthesis of the test results. Feedback from the stroke coordinators was critical and incorporated into the final module. The regional stroke coordinator liaison was an essential reviewer of the module before it was saved in the shared workspace and intranet portal. Presentation of the module to key stakeholders and stroke coordinators was held in the monthly peer group meeting. Utilizing the Gantt chart assisted with management and completion of the project.

Work Breakdown Structure

A work breakdown structure (WBS) was created to organize the scope of the module (see Appendix F). A WBS divides a project into smaller increments and detailed tasks to make it manageable (Martinelli & Milosevic, 2016). The WBS is a tool to ensure that all parts of the work are included for a successful project without being overwhelmed.

The primary level in organizing the self-learning module consisted of project initiation, assessment, module development, implementation, data analysis and evaluation, and project completion. Project initiation consisted of completing the DNP statement of non-research development, receiving the Institutional Review Board (IRB) organization approval, and gaining organizational letter of support. Assessment of the project included interviewing the medical center stroke coordinator. The initial feedback in assessing the components of the stroke coordinator's training orientation was essential to focus on the areas that required further development. The knowledge gap from the stroke coordinator in learning the TJC stroke recertification requirements served as a baseline in improving the orientation program. The current training tools were reviewed for their content in survey preparedness and assessed for whether they were available at the local medical centers and regional office. The assessment required further investigation, as there are 21 medical centers within the integrated hospital system, which involved interviewing all the stroke coordinators. Similarly, the stroke coordinator's initial competency checklist was evaluated for TJC survey preparedness content. Lastly, the feasibility of the project required approval from the regional stroke coordinator liaison, who was the main stakeholder. It is crucial to build a relationship with the stakeholder by having regular communication throughout the project (LinkedIn, n.d.). Liaison buy-in was vital to the project success, as the role has the oversight of the stroke program regionally. As a stakeholder, the liaison had an interest in the project outcome, since the module will be made available to all the medical centers.

The module development took the majority of the time of the project, as it involved creating an initial checklist for the content of the module and required feedback from the subject matter experts (SMEs). The regional stroke coordinator and seasoned stroke coordinators were

interviewed and surveyed to receive their expert opinion of the critical aspects of TJC stroke recertification survey readiness. The feedback served as a guide in content development. Once the input was received, a draft of the content was developed and required several revisions based on the information from the SMEs. Short quizzes at the end of each part of the module were developed for knowledge check and ensured participant engagement throughout the module. Finally, the module was entered in a PowerPoint presentation with supplementary resources.

The initial implementation of the project involved identifying the main participants. A list of the stroke coordinators from the 21 medical centers was obtained from the regional stroke coordinator liaison. The participants' experiences varied from novice coordinators with no prior experience with TJC DSC survey preparedness as a stroke coordinator to those who may have had previous experience with the TJC DSC survey, either with the organization or outside the organization. After the participants were obtained, an email was sent to communicate the purpose of the project. A follow-up phone call and attendance at the quarterly regional stroke meetings were utilized to ensure participation from the stroke coordinators. The self-learning module was sent to the participants, with a specific deadline to review and complete. Once completed, the stroke coordinators were evaluated to assess the knowledge improvement acquired from the self-learning module.

Data analysis and evaluation included a survey to evaluate the effectiveness of the module. A pre-assessment measurement was generated for baseline data collection before the actual intervention was administered. The pre-assessment included a set of questions to gain insight into the stroke coordinator's knowledge of the TJC DSC requirements. A post-assessment was conducted within four weeks to allow the participants to review and access the content online at their medical centers. The results of the post- assessment were analyzed to

evaluate the knowledge gain of the TJC DSC requirement and standards in preparation for certification survey using the online self-directed learning module. Finalization of the project included a presentation to key stakeholders and submission to the DNP committee.

Strengths, Weaknesses, Opportunities, and Threats Analysis

A strengths, weaknesses, opportunities, and threats (SWOT) analysis was used to identify the areas that influenced the outcome of the project (see Appendix G). A regional stroke coordinator liaison, committed to the stroke coordinators' education and supportive of the change, was one of the main strengths of the project. The existing stroke portal website and the ability to consult with seasoned stroke coordinators as subject matter experts were identified as critical established resources which would be advantageous to early project development. The opportunity to standardize the regional educational training on the survey preparedness process was identified to result in better certification outcomes for all the medical centers. Competing demands and priorities of the role leading to lack of allocated time to complete the module was identified as a significant potential weakness. Inconsistent training methods throughout the region to prepare for recertification survey made it challenging to learn the requirements serving also as an existing weakness. Threats included a change in the standards by TJC, which would require module updates, as well as lack of support from the managers for the stroke coordinators' training.

Responsibility/Communication Plan

A responsibility and communication plan was completed to ensure that main stakeholders receive a clear and timely message (see Appendix H). The local stroke coordinator and two of the seasoned stroke coordinators were utilized to provide feedback on the training and module content. The regional stroke coordinator liaison offered guidance and consultation on module

development. The monthly and quarterly regional stroke meetings served as the forum to communicate the project status to all stroke coordinators. Face-to-face meetings, conference calls, and emails were utilized as the modes of communication to provide flexibility and accessibility to the stakeholders.

Cost Benefit and Return on Investment Analysis

A project should only be considered if it meets the organizational mission, vision, and values, even if it has a high financial return (Waxman, 2018). It is important to assess the unwarranted variation for quality improvement, as it can impact cost and outcomes (Partington et al., 2017). A training module that is standardized in the Northern California region ensures patient safety and quality of care are provided for stroke patients, ensuring adherence with evidence-based guidelines by the stroke team.

The return on investment (ROI) for this project was based on both financial and quality outcomes (see Appendix I). The ROI is calculated by adding the regulatory cost avoidance to the cost benefit per treated stroke patient and subtracting the program cost. A successful TJC recertification survey means a hospital continues the designation as a primary stroke receiving center. Certification is associated with increased timely thrombolytic treatment and improved outcomes, which increases trust and credibility from referring healthcare community and patients (Bresette, 2020). The Medicare reimbursement for stroke DRGs ranges from $4,400 to $16,000 (Bachik & Lang, 2015). Based on the 2019 stroke-related admission data from one of the 21 medical centers, the cost benefit per treated stroke patient is approximately $11,000. With an average of three stroke patients per week, this project will have a cost benefit of $33,000. Cost avoidance was estimated based on the regulatory cost of one action plan at $9,000 (100 hours of $90/hour labor cost) that is developed by a core team of stroke coordinator, interdisciplinary

stroke team, and local and regional Accreditation, Regulation, and Licensing (AR&L) department. The action plan may also include additional staff training and monitoring of performance measures in response to the program failing in one of the standards or requirements.

A budget plan was developed, with the primary expense spent on planning and module development (see Appendix J). The regional stroke coordinator liaison's and seasoned stroke coordinators' expense is based on their consultation time. Lastly, the expense from the medical center stroke coordinator was incurred from the review and evaluation of the module.

Future annual cost of the project includes training of new stroke coordinators, with an estimated 2-hour training time to complete the module (see Appendix K). An annual refresher of the module is recommended for the stroke coordinator, as the recertification survey is every two years. Additionally, any update on the standards and requirements was included in the refresher training.

The annual ROI for placing the module in the Northern California Stroke Program Information website and Microsoft (2019) Teams site during the operational period is $87,660. The advantage of the two repository sites is the easy access to revise the module at any time for any updates on the standards and requirements; however, it requires the managers to oversee the completion of the module by the stroke coordinators.

The long-term plan is to place the module in HealthStream, an electronic learning system. While there is a slight variance of $17,200 ROI between the website and electronic system due to data fees and expense on transferring the module content, the long-term benefit of the learning system is the automatic assignment of the module for the stroke coordinators to complete it annually. The disadvantage of the system is that it will require removing the module from HealthStream circulation for any new updates.

Study of the Intervention

A certification survey preparedness module for stroke coordinators was developed to standardize the training throughout the 21 medical centers. Standardization supports patient safety, drives quality improvement, and results in sharing of best practices (Bates, Schrewe, Ellaway, Teunisssen, & Watling, 2019). The online module is an educational resource guide to familiarize the stroke coordinators with certification standards and requirements. An analysis of the pre- and post-assessment knowledge scores was completed by the participants to determine the effectiveness of the module.

The module was introduced to the stroke coordinators at one of the monthly peer group meetings. Subsequently, a list of stroke coordinators was received from the regional stroke coordinator liaison. The list included the 21 medical centers with part-time and full-time stroke coordinators, including six vacant positions. The years of experience ranged from newly hired to up to 10 years as a stroke coordinator. A seasoned stroke coordinator was considered a SME by the regional stroke coordinator liaison based not only on years of experience, but an in-depth knowledge of the standards and requirements acquired through orientation and training. A pre-assessment of their knowledge on certification standards and requirements was performed using a survey tool. After scoring of the pre-intervention knowledge scores, the module was distributed through the participant's email. The stroke coordinators were given four weeks to complete the module, with a 10-item, multiple-choice post-test at the end to assess for knowledge acquisition. An evaluation survey was also completed to provide feedback on the effectiveness of the module. The survey solicited feedback on sufficient content information and tools to assist with survey preparedness, ease of module access, and self-pace completion. It also incorporated three open-ended questions to evaluate the most helpful and least useful aspect of

the module, including topics that would be found beneficial in survey preparedness. The results of the evaluation were crucial as the necessary modification was made to enhance the content of the risk assessment on the SAFER matrix.

Measures

There were three outcome measures based on the aim statement of the project. The first objective was to create a certification survey preparedness module to standardize the stroke coordinators' training. The nurse-related outcome measure was the percentage of stroke coordinators who completed the education module and the feedback received on its effectiveness. The content of the module was developed based on the expert feedback received from two of the three seasoned stroke coordinators. Participants were encouraged to complete the module and survey by providing an initial background presentation of the module in one of the monthly peer group meetings. Thereafter, a follow-up email was sent to each stroke coordinator to complete it at their own pace at the medical center. The regional stroke coordinator liaison also reminded the participants in the subsequent meetings to complete it during the survey period. A simple, eight-item survey to assess the participants' perception and feedback for future consideration and enhancement of the module was administered (see Appendix L). The questions were formulated based on the findings in the literature review. Team participation and satisfaction of developing the module were also obtained from the SMEs (see Appendix M).

The second objective was the improvement in the stroke coordinators' knowledge acquisition of the certification standards and requirements, as demonstrated by overall score improvement through data analysis. The outcome measure was gathered from the pre- and post-assessment of stroke coordinators' knowledge scores using a 10-item, multiple-choice test. No

validated knowledge tool regarding TJC survey preparedness and stroke coordinator knowledge existed. As a result, the expertise of the regional stroke coordinator was utilized on the validity and reliability of the pre- and post-assessment tool. The appropriateness and contextual accuracy of the questionnaire was also obtained from the regional stroke coordinator liaison as the content expert. A multiple-choice test was the format utilized to measure knowledge improvement based on literature review conducted on knowledge acquisition. The questions were formulated using the TJC certification process, clinical practice guidelines, intra-cycle review, standard risk assessment, patient and staff education, and performance measures (see Appendix N).

The third objective was the increase in understanding of the SAFER matrix. The SAFER matrix is a scoring methodology by TJC. It is used to identify the risk levels of deficiencies. The level of risk is identified based on the likelihood that a deficiency will cause harm and the wide spread of the scope of the issue (TJC, 2019). The outcome measure was assessed by correctly placing an RFI on the matrix tool. The post-assessment included specific related questions of the SAFER matrix embedded in the 10-item multiple-choice test (see Question 9 in Appendix N). The matrix is a valid and reliable tool to understand the critical issues that require priorities for improvement based on the severity of risk if a standard is not met.

Analysis

Descriptive variables included age, gender, level of education, number of years as a registered nurse, number of years as a stroke coordinator, and amount of time dedicated to the stroke coordinator role (see Appendix O). The variables that had impact on the outcome of the study are years of experience as a stroke coordinator (0-3 years: n = 12, 80%; 4-6 years: n = 2, 13%; 7-10 years: n = 1, 7%) and the number of hours spent per week dedicated to the stroke coordinator role (1-10 hours: n = 2, 13%; 11-20 hours: n = 6, 40%; 31-40 hours: n = 7, 47%).

The pre- and post-assessment surveys were conducted utilizing the Qualtrics (2020) software to send the electronic questionnaire link to the email of participants. The variance in knowledge score between the pre- and post-test determined the level of understanding of the stroke TJC standards and requirements (see Appendix P and Appendix Q).

The participants' evaluation of their perception of the effectiveness of the module was evaluated using a 5-point Likert scale (see Appendix L). The form also included open-ended questions to assess the aspects of the module that were found most helpful to least helpful and suggestions on additional topics to assist with certification survey preparation.

Ethical Considerations

Permission to perform the project was obtained from the university and the healthcare system. A statement of determination as a non-research performance improvement project was submitted and approved by both entities (see Appendices R, S, and T). The stroke coordinators' participation in completing the survey was voluntary and anonymous. Qualtrics (2020) software survey was used to collect the pre-assessment, post-assessment, and module evaluation. A Starbucks gift card was provided to the stroke coordinators as a token of appreciation for participating in the survey.

The project aligns with the Jesuit values of *cura personalis*, or care of the whole person (University of San Francisco, n.d.), and the American Nurses Association (ANA, 2015) Code of Ethics, as the self-directed learning module is a vehicle to improve the stroke coordinator's knowledge to ensure that the interdisciplinary team adheres to all aspects of evidence-based measures to deliver care safely. The ANA emphasizes the ethical obligation of the nursing profession on patient safety and quality of care (ANA, 2015). As a stroke coordinator, it is

crucial to stay abreast of evidence-based practices and up-to-date clinical practice guidelines to lead the stroke team in achieving positive patient outcomes.

Section IV: Results

Demographics

The participants' demographics are shown in Appendix O. Out of 15 participants, mainly were female (*n* = 11, 70%), and within the age range of 31-40 years (*n* = 7, 50%). The educational levels of the stroke coordinators were bachelor's degree (*n* = 4, 27%), master's degree (*n* = 9, 60%), and doctorate degree (*n* = 2, 13 %). The participants worked as a registered nurse 0-10 years (*n* = 4, 27%), 11-20 years (*n* = 4, 27%), 21-30 years (*n* = 4, 27 %), and greater than 30 years (*n* = 3, 20%). Eighty percent (*n* = 12) of the nurses had been a stroke coordinator for only up to three years. Almost half of the participants dedicated 31-40 hours to the role (*n* = 7, 47%). In contrast, the rest of the stroke coordinators only spent 1-10 hours (*n* = 2, 13%) and 11-20 hours per week (*n* = 6, 40%) due to other functional roles as quality nurse, sepsis coordinator, assistant manager, manager, or infection preventionist.

Knowledge Scores

An increase in knowledge scores was evident for all the stroke coordinators who participated in the training. The average percentage improvement for the 10-item self-assessment was 19.5% or 20% (see Appendix P). The most improved scores were in the standards of data, patient satisfaction, and RFI.

Data collection is one of the challenging roles of a stroke coordinator, as performance improvement is based on specific quality measures to improve stroke care delivery. Some of the data are automated and the rest are still manually pulled; therefore, it is critical that each data point is accurate, not only for improvement efforts but to maintain TJC certification and American Heart Association recognition award.

Patient satisfaction is an area that is being reviewed by TJC during recertification surveys, as it is now publicly reported and tied to reimbursement. Due to a small sample of stroke patients in the medical center, the data presented during the surveys has always been limited to show statistical significance. Stroke coordinators have been creative by showing a comparison of stroke patients with the rest of the patient population using Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS).

A Requirement for Improvement (RFI) is short for a *survey finding*. An RFI requires that an organization develop an action plan on how a specific standard deficiency will be resolved. Typically, a stroke coordinator collaborates with the interdisciplinary stroke team to create an Evidence of Standard Compliance (ESC) that will need to be reviewed by committees, involved leaders, and the AR&L department before it is submitted to TJC. Data monitoring and tracking may be a part of the submission, and how the plan will be sustained is captured on the ESC.

SAFER Matrix

In contrast, the area that had the least improved score was placing the RFI on the SAFER matrix. An assumption of the stroke coordinator's lack of understanding in the placement of the standard on the patient safety matrix was due to a recent change in scoring methodology. Every single observation is considered an RFI and plotted on the matrix on the scope of it being wide-spread and the likelihood for harm. As a result of this finding, the module was refined by providing additional explanation and knowledge check exercises for understanding. The knowledge checks included case studies of standard deficiency and identifying the prevalence and likelihood to harm a patient, staff, or visitor. The revised module was distributed to a small focus group of two new stroke coordinators to assess its effectiveness. The result showed a

significant improvement in this area (see Appendix Q). Unsolicited feedback received from one of the participants validated that the supplementary information clarified the SAFER matrix.

Module Evaluation

The results of the stroke coordinators' perceptions and feedback are presented in Appendix U. It was administered using a 5-point Likert scale from strongly disagree, disagree, somewhat agree, agree, to strongly agree with three open-ended questions. The evaluations received were incorporated into the enhancement of the final module. Percentages of *agree* and *strongly agree* were combined on the following questions:

- The module provided necessary information that will assist a stroke coordinator gain knowledge to prepare for the TJC certification survey *(n* = 9, 100%).
- The online self-learning module is an alternative educational format that will allow me to access it anytime as a reference tool *(n* = 8, 90%).
- The self-learning module allowed me to pace myself to complete it *(n* = 9, 100%).
- The module helped me to think independently about how to prepare for the stroke certification survey *(n* = 7, 78%).
- I found the supplementary resources/links/references/tools helpful *(n* = 8, 90%).

The most helpful aspects of the module were checking the participants' understanding of the content exercises, concise review of the standards, and supplemental resources. The amount of information to be retained and less interactive nature of the module were found to be least helpful.

The two SMEs' feedback was also obtained using open-ended questions (see Appendix M). They were referred by the regional stroke coordinator liaison as the most knowledgeable stroke coordinators. The survey questions included years and experience as a stroke coordinator,

role orientation, and broad range of topics to be incorporated in survey preparedness. Both SMEs found participating in the module development to be valuable and strongly agreed that the module will assist in training new stroke coordinators, based on their own training and orientation to the role. One of the participants had been in the role for six years, while the second participant had been a stroke coordinator for almost three years. Both SMEs had no prior experience in coordinating a stroke program. One of them was familiar with TJC standards from an accreditation and regulation standpoint, which assisted in the interpretation of the stroke program standards. The second SME was fortunate to be trained by an outgoing stroke coordinator. The feedback on the development of the module ranged from data and standard interpretation to using a checklist as a tip sheet on how to navigate an onsite survey.

Section V: Discussion

Summary

Based on the results, the project aim and objectives were achieved. Part of the success was due to the support of the regional stroke coordinator liaison and new stroke coordinators, who were vocal to speak up about the lack of training and need to standardize the training regionally. Sustainability of the module will require commitment from the main stakeholders: the regional stroke coordinator liaison, who oversees the stroke program to ensure the module is updated for new standards and requirements, and managers of the stroke coordinators, who need to include the module as part of the orientation process in the medical center.

As a transformational leader, creating a culture of shared decision-making supports evidence-based innovation (Weberg & Davidson, 2019). The stroke coordinators are known to have built a strong network within the organization. They share best practices to improve patient quality outcomes and rely heavily on each other to receive information on new upcoming standards and requirements or protocols that might affect their local stroke program. The shared decision-making and partnership with the stroke coordinators early in the project created buy-in and better engagement in the creation of the module. It was critical they were part of every stage of the project.

Interpretation

A standardized training module for stroke coordinators was long overdue. Since the initial certification survey preparation, it was realized that there was a need for a training module, as new stroke coordinators fill the role frequently. Part of the barrier is time and competing priorities to develop it. The results illustrated the identified knowledge gap, and this school project initiated the fruition of the training module.

One of the key learnings of this project was to understand the data results and to listen to the participants. At first, it was difficult to understand the low scores of the SAFER placement. The information seemed clear, and the references provided were sufficient. However, after speaking with a few of the stroke coordinators, it was made known that the SAFER methodology was a recent change in TJC scoring of RFI and required a representative from Accreditation, Regulation, and Licensing (AR&L) to explain the placement. As a result, a detailed explanation of the scoring methodology, with extra knowledge check exercises, was included.

Limitations

The main limitation noted for the project was the frequent turnover of stroke coordinators, which affected the small size of the participants during the pre- and post-interventions, including the two stroke coordinators who reviewed the revised module, to draw statistical significance of the quality improvement project. At the beginning of the survey, there were six stroke coordinator vacancies. Due to the small size and the experience of seasoned stroke coordinators, it was difficult to ascertain if the higher knowledge scores on certain domains were from their familiarity of the standards and requirements. The anonymity of the survey also made it challenging to clarify the open-ended responses on the module participant evaluation. A follow-up with the participant on how to make the module more interactive or a list on the specific content that could be cut down would have been helpful in the module modification.

The lack of dedicated time to complete the module was a barrier for a few of the stroke coordinators. Reminders to participants consisted of frequent emails and follow-up phone calls. A coffee gift card and direct request from the managers provided some encouragement; however, it was not enough to incentivize the module and survey completion from the participants. At

some point, the survey link was discontinued to analyze and evaluate the initial data. The feedback from the two stroke coordinators on the revision of the module came back just in time before the start of the COVID-19 pandemic, when everyone in the medical center was getting prepared for a potential surge.

With the rise of the pandemic, regulatory survey site visits were deferred, which meant two of the new stroke coordinators, who completed the revise module and were waiting for their recertification surveys, had to be delayed until further notice. This postponement limited the ultimate measure of success that an online, self-directed learning module results in a successful TJC certification survey. Though there was an interest to replicate the module in the southern region affiliated hospitals, it was not achievable due to COVID-19.

A future opportunity for this project would be to implement the module as a mentoring tool between the seasoned stroke coordinator and the less experienced coordinator. Another consideration is to combine the module with real-time feedback and questions. This format will be similar to a blended learning method, with the ability to contact a seasoned stroke coordinator to explain the content in further detail. The heavy content on some sections of the module can also be divided into smaller parts to improve knowledge retention.

Conclusion

A self-learning module is an effective alternative educational method for stroke coordinators who are faced with competing priorities and workload challenges. This modern approach to learning requires self-motivation and self-direction. A standardized module made available for the 21 medical centers will deliver consistent information to all stroke coordinators. It serves as a tool to ensure patient safety and quality of care are provided for stroke patients, ensuring adherence with evidence-based guidelines by the stroke team. A knowledgeable and

competent stroke coordinator can facilitate a successful TJC certification survey and lead their local team to achieve excellent clinical outcomes.

In conclusion, sustainability of this work will be actualized through the regional stroke coordinator liaison, who oversees the program within 21 medical centers. The module will be incorporated in a new stroke coordinator orientation. A future opportunity is to spread the module through the Southern California region. This standardized educational module will serve as a valuable tool that can assist with program certification success within the entire organization.

Section VI: Other Information

Funding

There was no external funding for this DNP project.

Section VII: References

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Section VIII: Appendices

Appendix A

Self-Learning Module Evaluation Table

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Tohidi et al. (2019)	Evaluate the self-directed module teaching method on clinical competency	None	Randomized control trial	*N* = 46 Nursing students Iran	Self-learning module	Clinical competency scores	Mann-Whitney U-test	The group who received the self-learning module increased the student's clinical competency.	Level IA
Smith et al. (2019)	Evaluate self-training versus classroom training in polyp prediction	None	Randomized control trial	*N* = 16 Gastro-enterology trainees UK	Didactic learning and computer-based self-learning	Performance in predicting histology Pre- & post-training assessment	Fisher's Exact Test, Wilcox-Rank sum test	The computer self-learning group was higher in prediction with both NICE and SIMPLE classifications; higher prediction with the didactic group using only the NICE classification.	Level IA
Karvinen et al. (2017)	Evaluate the effectiveness of online learning module	Social cognitive theory	Randomized control trial	*N* = 54 Oncology nurses	Online learning module	Improvement in physical activity counseling skills and practices	Independent sample *t*-test, chi-square, ANCOVA	Significant increase in self-efficacy and reduced barriers for providing physical activity counseling in learning module group. No	Level IA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
								significant changes in physical activity counseling practice, knowledge about physical activity for cancer survivors, or perceived benefits of physical activity counseling between the learning modules group and the control group.	
Rahmati et al. (2018)	Compare mobile-based and lecture-based learning on midwives' knowledge on pre-eclampsia and eclampsia management	None	Randomized control trial	*N* = 70 Midwives Iran	Mobile-based (e-learning) and lecture-based	Knowledge acquisition	*t*-test	E-learning had a significant positive effect on the awareness of midwives regarding management of preeclampsia and eclampsia one week and one month after the intervention.	Level IA
Warner et al. (2019)	Evaluate the two instructional designs (prior knowledge and use of questions)	None	Randomized control trial	*N* = 114 Anesthesiologist residents	Adaptive vs non-adaptive and enhanced interactive vs less	Knowledge, time to complete the module, and self-efficacy	ANOVA/ ANCOVA, Van Der Waerden rank scores, Hodges Lehmann	Knowledge: no significant difference immediate post-module; time spent in baseline knowledge	Level IA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
	using online learning module				interactive interven-tions in online module learning		estimates, *t*-test,	section was lower, and knowledge efficiency was significantly higher. Self-efficacy: high at pre-module and increased at post-module. Amount of improvement did not depend on interactivity. User experience-significant change in motivation for adaptive version. Adaptive led to faster module completion with no reduction in knowledge scores and improved knowledge efficiency 2-month post-assessment: no significant difference. Although, total knowledge score and self-efficacy were lower; 5	

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
								repeated knowledge items were significantly higher showing sustained knowledge.	
da Costa Vieira et al. (2017)	Assess information retention in oncology using e-learning	None	Randomized control trial	*N*= 67 Physiotherapy students Brazil	E-learning module vs traditional classroom	Knowledge acquisition and retention	Chi-squared test, *t*-test	Significant knowledge improvement between pre-test to post-test, but no difference in knowledge retention between 2 groups.	Level IA
Gillan et al. (2018)	Evaluate the knowledge and user satisfaction of high-fidelity vs low-fidelity e-learning modules	None	Randomized control trial	*N* = 18 Radiation oncology residents Canada	High-fidelity vs low-fidelity e-learning modules	Knowledge acquisition and satisfaction	*t*-test	Knowledge scores higher in senior trainees; high-fidelity had greater impact on knowledge acquisition; participants expressed satisfaction with both high-fidelity and low-fidelity interface.	Level IB
Wu et al. (2018)	Synthesize the online training programs for preceptors	None	Systematic review	*N* = 9 studies Nurse preceptors	Online learning programs	Development of program, content, program uniqueness, modes of	Narrative synthesis of studies	Development of program: most studies were based on theoretical framework;	Level IA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
						delivery, and outcomes		Program content: varied from short descriptions to detailed reports; program uniqueness included accessibility, flexibility, online learning community, avatar, video clips, podcasts; Modes of delivery: 6 studies consisted of computer-assisted instructions, online communities, podcasts; one study with blended learning of online and instructor-led class; 1 used virtual simulation; 1 used a CD-ROM with visual and verbal aids.	
McCutcheon et al. (2014)	Compare several studies on teaching methods of	None	Systematic review	*N* = 19 studies Nursing students	Online, face-to-face, and	Knowledge, performance and clinical skills, self-	Narrative synthesis of studies	Knowledge: out of 13 papers that assessed knowledge, 7	Level IA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
	online, face-to-face, and blended platform				blended platform	efficacy/ clinical confidence, user satisfaction		had a higher level of knowledge with online learning; 2 papers following a face-to-face teaching; rest of studies with no significant difference. Performance/ clinical skills: out of 13 papers reported on clinical skills, 6 had significant results to skill performance with online learning; 1 with only one of the skills and other skills with no significant, difference; rest of studies with no significant difference. Self-efficacy/ confidence: 3 papers reported on self-efficacy with varied outcomes. User satisfaction with online learning:	

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
								Out of 11 papers reported on satisfaction, 5 had higher satisfaction, 1 had low satisfaction, 4 with no significant difference; and 1 qualitative data with low satisfaction.	
Gagnon et al. (2015)	Evaluate a self-directed online method containing six modules	None	Quasi-experimental	*N* = 116 Nursing students Canada and Spain	Self-learning online modules	Learning readiness, satisfaction, knowledge acquisition	*t*-test for paired samples, McNemar test for qualitative variables	Knowledge: statistically significant increase in Quebec and Basque participants for all modules pre- and post-tests. Self-directed learning readiness: both groups exceeded. Satisfaction of modules: Quebec and Basque at high level of satisfaction.	Level IIA
Ens et al. (2016)	Evaluate the knowledge and comfort related to pubertal	None	Quasi-experimental	*N* = 64 Medical residents Canada	Online learning module on pubertal	Knowledge, confidence, comfort level in examination	Chi-square test, Mann-Whitney U-test, *t*-test	Higher total knowledge score; significant	Level IIA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
	exam and assess the effectiveness of a learning module to address these gaps				examina-tion			increase in confidence; no difference in comfort level between control and intervention.	
Parsons et al. (2019)	Evaluate the effectiveness of learning module on the participants' knowledge, confidence, experience, and understanding of spirometry measurements and interpretation	None	Quasi-experimental	*N* = 48 Medical and nursing health professionals Australia	Spirometry learning module	Knowledge, confidence, experience, and understanding of spirometry measurements and interpretation	Friedman test, Spearman test	Significant improvement of knowledge, perceived confidence, experience, and understanding.	Level IIB
Rafferty et al. (2018)	Evaluate the knowledge gain using a self-directed training module	None	Quasi-experimental	*N* = 45 Clinical officers Kenya	Self-directed learning module on acute HIV infection (AHI)	Knowledge of AHI	Wilcoxon–Mann-Whitney test	Significant improvement in knowledge of AHI.	Level IIB
Goff et al. (2018)	Investigate the effectiveness of online learning module	None	Quasi-experimental	*N* = 629 Biology students	Online cellular respiration learning module vs traditional lecture group	Knowledge of biology concepts	ANCOVA, linear regression	Online learning group have higher normalized gain scores compared to traditional lecture.	Level IIB

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
Elkin et al. (2018)	Evaluate the use of educational module on confidence and knowledge of celiac disease	None	Quasi-experimental	*N* = 13 Nurse practitioners	Online education module	Confidence and knowledge of celiac disease	*t*-test	Confidence significantly improved at pre-test, immediate post-test, 6-week follow-up, and 20-week follow-up; knowledge on 3 subcategories improved at immediate post-test and plateaued at 6-week post-test.	Level IIB
Boet et al. (2017)	Evaluate the effectiveness of central venous catheter insertion with ultrasound guidance online training module on knowledge and skills acquisition	None	Quasi-experimental	*N* = 16 Attending physicians Canada	Online training module	Knowledge and competency skills	ANOVA	Significant improvement in knowledge between pre-test, immediate post-test, and retention test; skill performance - no significant difference.	Level IIB
Wentzell et al. (2018)	Evaluate the interpretive skills and confidence of medical students using e-learning module	None	Mixed-method	*N* = 87 Medical students Ireland	E-learning module in radiology teaching	Competency skills, confidence level	ANOVA, *t*-test, Spearman's rank correlation coefficient	Overall performance was statistically significant, although performance was still poor in diagnosis post-intervention; confidence level increased but	Level IIIA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
								still relatively low in with most below 3 on a 5-point Likert scale.	
Kennedy et al. (2019)	Evaluate self-perceived understanding of learning needs and skills for domains in a self-directed learning module	None	Mixed-method	*N* = 201 Medical students UK	Self-assessment of learning outcomes before and after the Ageing and Health module	History taking skills, examination skills, knowledge of medication use, co-morbidity, nutritional and swallowing assessment	*t*-test, Mann-Whitney U, Kruskall Wallis	Significant increase in the post-Visual Analogue Scale (VAS) scores compared to the pre-scores for self-perceived learning needs for the aggregated group; themes identified: improved awareness of learning needs, easy to use, useful for future learning needs, online self-assessment, self-reflection of strengths and weaknesses, self-motivation.	Level IIIA
Keis et al. (2017)	Obtain the students' perspectives on the online format or face-to-face	None	Qualitative	*N* = 10 Medical students Iran	Online course on ECG, face-to-face course	N/A	Interview questions compiled by SPSS method and responses clustered	Strengths and weaknesses of the two formats were obtained.	Level IIIA

Reference	Purpose	Conceptual Framework	Design/ Method	Sample/ Setting	Variables Studied	Measurement	Data Analysis	Findings	Appraisal: Worth to Practice
	echocardiogram course						into categories		
Gardner et al. (2016)	Explore the students' perceptions advantages and disadvantages of e-learning	None	Qualitative	*N* = 23 Physiotherapy students Australia	Online E-learning on chronic disease manage-ment	N/A	Recordings were transcribed; inductive approach to derive key themes/subth emes	Key themes were preference for combining online e-learning and lecture-style, using real-clinical examples, and facilitating e-learning.	Level IIIA

Adapted from "Implementing the Evidence-Based Practice (EBP) Competencies in Healthcare: A Practical Guide for Improving Quality, Safety, and Outcomes," by B. M. Melnyk, L. Gallagher-Ford, and E. Fineout-Overholt, E., 2017. Copyright 2017 by Sigma Theta Tau.

Appendix B

Summary of Studies Included in the Review

Author/Year	Purpose	Sample/ Setting	Outcome Measures			
			Knowledge	Competency skills	Confidence/ Self-efficacy	Satisfaction
Rahmati et al. (2018)	Compare mobile-based and lecture-based learning on midwives' knowledge on pre-eclampsia and eclampsia management	*N* = 70 Midwives Iran	X			
Warner et al. (2019)	Evaluate the two instructional designs (prior knowledge and use of questions) using online learning module	*N* = 114 Anesthesiologist residents	X		X	
Gillan et al. (2018)	Evaluate the knowledge and user satisfaction of high-fidelity vs low-fidelity e-learning modules	*N* = 18 Radiation oncology residents Canada	X			X
da Costa Vieira et al. (2017)	Assess information retention in oncology using e-learning	*N* = 67 Physiotherapy students Brazil	X			
Karvinen et al. (2017)	Evaluate the effectiveness of online learning module	*N* = 54 Oncology	X		X	

Author/Year	Purpose	Sample/ Setting	Outcome Measures			
			Knowledge	Competency skills	Confidence/ Self-efficacy	Satisfaction
		nurses				
Gagnon et al. (2015)	Evaluate a self-directed online method containing six modules	*N* = 116 Nursing students Canada and Spain	X			X
Parsons et al. (2019)	Evaluate the effectiveness of learning module on the participants' knowledge, confidence, experience, and understanding of spirometry measurements and interpretation	*N* = 48 Medical and nursing health professionals Australia	X		X	
Rafferty et al. (2018)	Evaluate the knowledge gain using a self-directed training module	*N* = 45 Clinical officers Kenya	X			
Goff et al. (2018)	Investigate the effectiveness of online learning module	*N* = 629 Biology students	X			
Elkin et al. (2018)	Evaluate the use of educational module on confidence and knowledge of celiac disease	*N* = 13 Nurse practitioners	X		X	
Ens et al. (2016)	Evaluate the knowledge and comfort related to pubertal exam and assess the effectiveness of a	*N* = 64 Medical residents	X		X	

Author/Year	Purpose	Sample/ Setting	Outcome Measures			
			Knowledge	Competency skills	Confidence/ Self-efficacy	Satisfaction
	learning module to address these gaps	Canada				
Boet et al. (2017)	Evaluate the effectiveness of CVC insertion with US guidance online training module on knowledge and skills acquisition	*N* = 16 Attending physicians Canada	X	X		
Wu et al. (2018)	Synthesize the online training programs for preceptors	*N* = 9 studies Nurse preceptors	X	X	X	X
McCutcheon et al. (2014)	Compare several studies on teaching methods of online, face-to-face, and blended platform	*N* = 19 studies Nursing students	X	X	X	X
Kennedy et al. (2019)	Evaluate self-perceived understanding of learning needs for domains in a self-directed learning module	*N* = 201 Medical students UK	X	X		
Tohidi et al. (2019)	Evaluate the self-directed module teaching method	*N* = 46 Nursing students		X		
Smith et al. (2019)	Evaluate self-training versus classroom training	*N* = 16 Gastroenterology trainees UK		X		

Author/Year	Purpose	Sample/ Setting	Outcome Measures			
			Knowledge	Competency skills	Confidence/ Self-efficacy	Satisfaction
Wentzell et al. (2018)	Evaluate the interpretive skills and confidence of medical students using e-learning module	*N* = 87 Medical students Ireland		X	X	
Keis et al. (2017)	Obtain the students' perspectives on the online format or face-to-face echocardiogram course	*N* = 10 Medical students Iran				X
Gardner et al. (2016)	Explore the students' perceptions advantages and disadvantages of e-learning	*N* = 23 Physiotherapy students Australia				X

Appendix C

Application of Principles of Knowles's Andragogy Model to the Stroke Coordinator Role

Principle	Description
Need to know	Adults need to understand the relevance of the content information. It is crucial for stroke coordinators to remain current with new evidence-based practice and clinical practice guidelines to lead the stroke team effectively.
Self-concept	Self-directed adult learners like to be in charge of their own learning needs. The online learning module provides an opportunity for the stroke coordinators to be self-directed in obtaining the information for survey preparation on their own terms and schedule.
Experience	For adult learners, life experiences serve as a source of self-identity. Stroke coordinators are experienced nurses who have the background knowledge that stroke is a life-threatening medical situation requiring immediate attention.
Readiness	Timing is essential in the adult learner's readiness and willingness to learn. Due to competing priorities of a stroke coordinator, the online, self-directed learning module allows them to access it at any time.
Orientation	For adult learners, task-focused or problem-focused is the learning orientation that applies to their real-life situations. The stroke coordinators understand that TJC certifies the hospital every two years; therefore, the need to demonstrate ongoing compliance with regulatory standards is essential.
Motivation	Adults are motivated to learn due to extrinsic factors (such as, money or promotions), and intrinsic reasons (such as, personal development or job satisfaction). Leading a successful survey can be a motivator to learn the critical certification elements covered in the online learning module.

Note. Adapted from "Educating Parents About Vitamin K in the Newborn Using Knowles' Theory of Adult Learning Principles as a Framework," by J. W. Twaddell, 2019, *Critical Care Nursing Quality*, *42*(2), pp. 205-207.

Appendix D

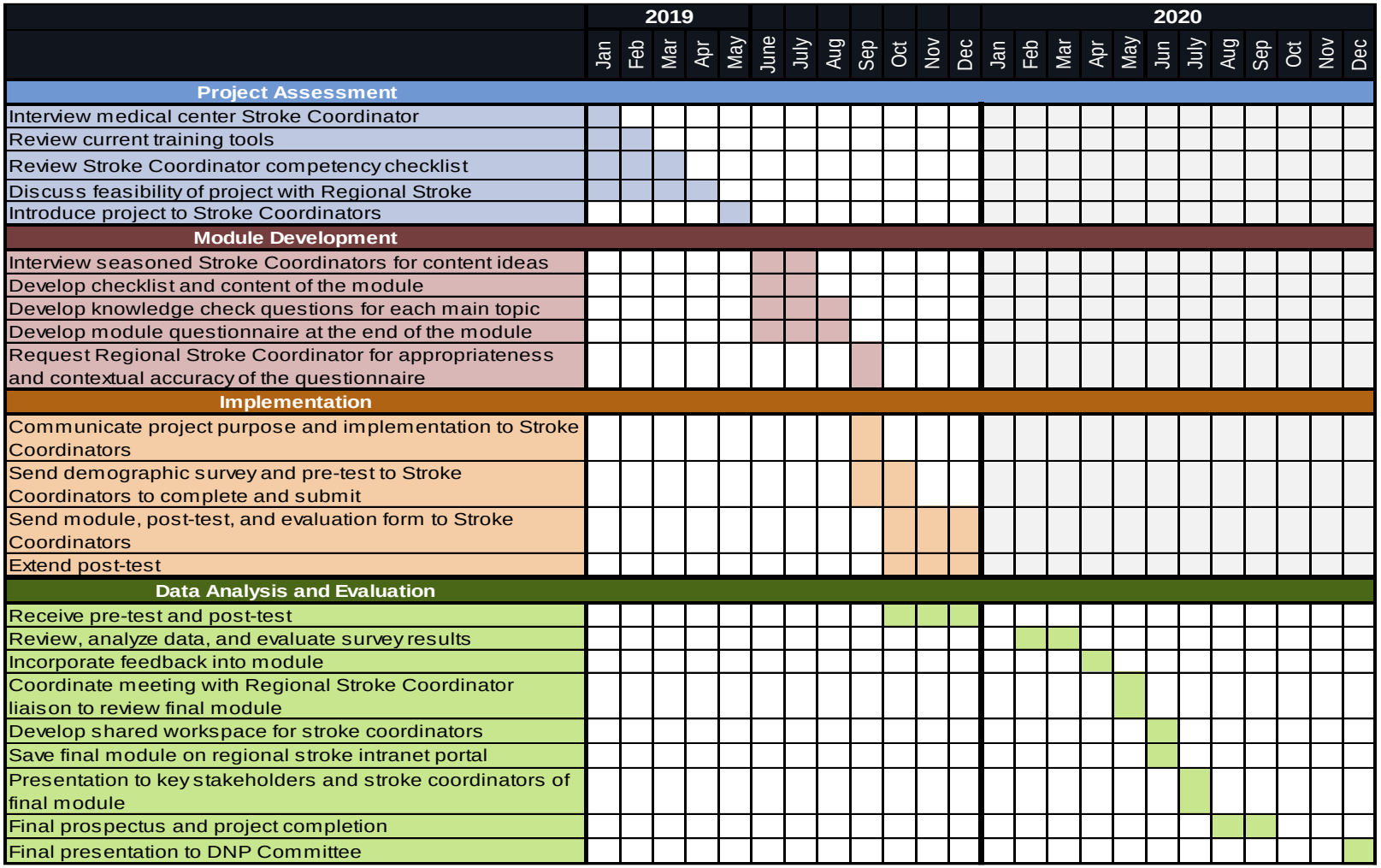
Gap Analysis

Facility Gap

Desired State	Current State	Next Steps
To create a standardized training by developing an online self-directed learning module	Lack of formal training for stroke coordinators	Develop an online learning module as a reference guide/toolkit Partner with regional stroke coordinator liaison Create a buddy partner for new stroke coordinator with a seasoned stroke coordinator
	Limited exposure to TJC standards and elements of performance to assess facility gap	Develop a standard risk assessment checklist
	Specific roles and responsibilities for stroke program management not included in the Quality Nurse Consultant orientation	Include roles and responsibilities in the orientation training checklist
	Lack of knowledge of stroke pathophysiology and importance for certification	Include literature/article reviews and attendance to stroke conferences in the orientation training checklist
	Lack of knowledge on how quality measures are measured, collected, and submitted to regulatory bodies	Include orientation training with regional data abstractor
	Limited exposure on creating a plan of correction for Requirement for Improvement post-recertification survey	Include orientation training with Accreditation, Regulation, and Licensing Director

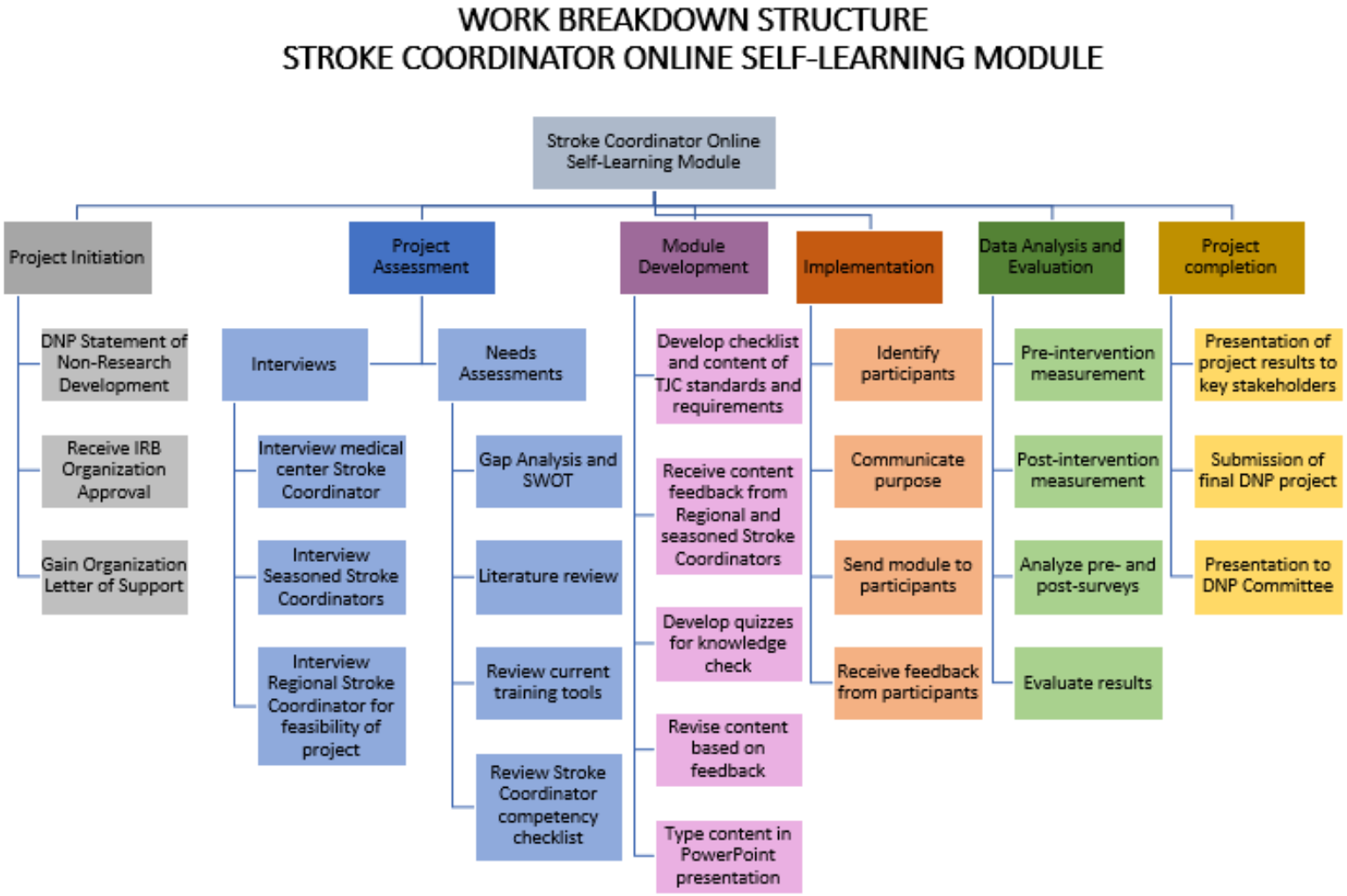
Appendix E

Gantt Chart



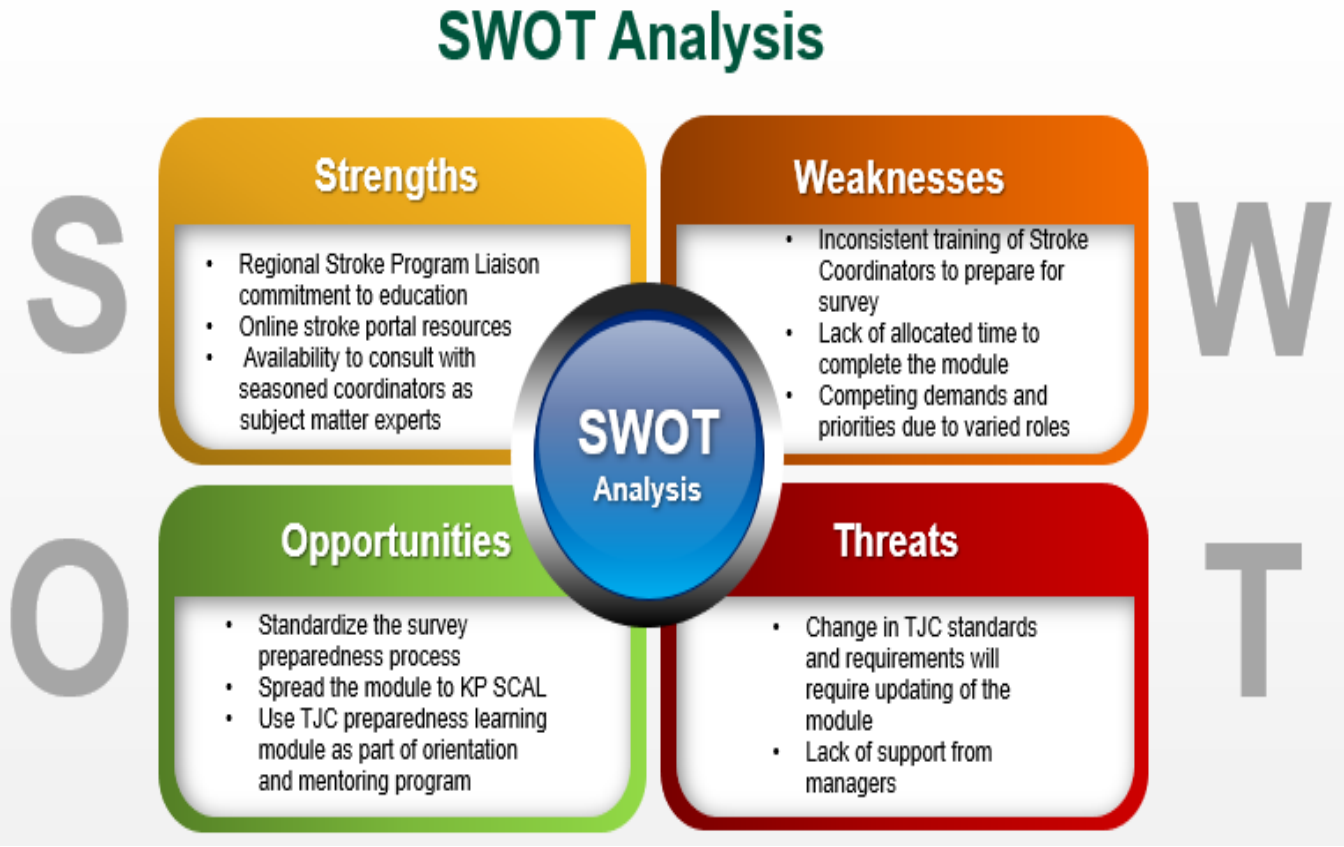
Appendix F

Work Breakdown Structure



Appendix G

SWOT Analysis



Appendix H

Responsibility/Communication Matrix

R	RESPONSIBLE
A	ACCOUNTABLE
C	CONSULTED
I	INFORMED

Team Member Role	Functional Group	RACI	Activity/Information	Method of communication	2019												2020											
					Jan	Feb	Mar	Apr	May	June	July	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Local oversight	Quality Director	R A	Develops module and conducts data collection	in-person																								
Local content reviewer	Local Stroke Coordinator	C	Provides feedback on training orientation, competency checklist	in-person																								
Regional program oversight	Regional Stroke Coordinator Liaison	C	Provides guidance and consultation of module development	conference call; email																								
Subject matter experts	Seasoned content experts	C	Provides expertise on module content	in-person; conference call																								
Local program coordinators	Medical Center Stroke Coordinators	I	Receive and review completed module	in-person;conference call; email																								

Appendix I

Return on Investment

Stroke Online Self-Directed Learning Module
Return on Investment (ROI)

Program Cost Avoidance

	Planning Period	Operational Period			
	2020	2021	2022	2023	Total
Regulatory Compliance*	$ -	$9,000	$9,000	$9,000	$27,000

*Program Cost Avoidance Calculation assumes the cost of one action plan at $9,000 (100 hours of $90/hr labor cost) for the development of the action plan by the stroke coordinators, leadership approval, local and regional Accreditation, Regulation, and Licensing department, response to The Joint Commission and any needed training. The action plan would be in response to the program failing in one of the standards and requirements.

Cost Benefit-Cost Avoidance-ROI (HealthStream)

	Planning Period	Operational Period			
	2020	2021	2022	2023	Total
Program Cost	$39,580	$5,320	$5,320	$5,320	$55,540
Cost Benefit**	$0	$33,000	$33,000	$33,000	$99,000
Cost Avoidance	$0	$9,000	$9,000	$9,000	$27,000
Return on Investment (ROI)	($39,580)	**$36,680**	**$36,680**	**$36,680**	**$70,460**
ROI % (Cost Benefit including cost avoidance-Program Cost /Program Cost	-	589%	589%	589%	27%

**Data based on 2019 stroke DRG admission= $11K cost benefit per treated stroke patient
Average stroke volume per week= 3 patients

Cost Benefit-Cost Avoidance-ROI (Regional Portal & MS TEAMS site)

	Planning Period	Operational Period			
	2020	2021	2022	2023	Total
Program Cost	$28,080	$3,420	$3,420	$3,420	$38,340
Cost Benefit**	$0	$33,000	$33,000	$33,000	$99,000
Cost Avoidance	$0	$9,000	$9,000	$9,000	$27,000
Return on Investment (ROI)	($28,080)	**$38,580**	**$38,580**	**$38,580**	**$87,660**
ROI % (Cost Benefit including cost avoidance-Program Cost /Program Cost	-	1028%	1028%	1028%	129%

**Data based on 2019 stroke DRG admission= $11K cost benefit per treated stroke patient
Average stroke volume per week= 3 patients

Appendix J

Budget

Stroke Online Self-Directed Learning Module
(HealthStream)
Module Planning and Development

Category of Cost	Estimated Hours	Estimated Cost/H	Estimated Subtotal
Project Developer	200	$90	$18,000
Regional Stroke Coordinator Liaison	20	$90	$1,800
Stroke Coordinator x 19 facilities	76	$90	$6,840
Seasoned Stroke Coordinator x 2 facilities	16	$90	$1,440
Regional Education Consultant	120	$80	$9,600
Data fees (HealthStream)**		$ -	$1,900
Total Costs			**$39,580**

**Annual data fee at $100/facility x 19 out of 21 licensed hospitals

(Regional Portal & MS TEAMS site)
Module Planning and Development

Category of Cost	Estimated Hours	Estimated Cost/H	Estimated Subtotal
Project Developer	200	$90	$18,000
Regional Stroke Coordinator Liaison consultation	20	$90	$1,800
Stroke Coordinator x 19 facilities consultation	76	$90	$6,840
Seasoned Stroke Coordinator x 2 facilities consultatio	16	$90	$1,440
Regional Education Consultant		$ -	$ -
Data fees (HealthStream)		$ -	$ -
Total Costs			**$28,080**

*Regional stroke coordinator provides monthly & quarterly updates on stroke standards & requirement. Also provides 1:1 training or consultation with stroke coordinator if needed.
**Training hours of Stroke Coordinator are based on updates received from regional stroke coordinator &/or local training if available.

Appendix K

Program Costs

Stroke Online Self-Directed Learning Module
(HealthStream)

	Planning Period	Operational Period			
	2020	2021	2022	2023	Total
Capital Expense					
Project Developer	$18,000	$ -	$ -	$ -	$18,000
Regional Stroke Coordinator Liaison Consultation	$1,800	$ -	$ -	$ -	$1,800
Seasoned Stroke Coordinator x 2 members	$1,440	$ -	$ -	$ -	$1,440
Regional Education Consultation	$9,600	$ -	$ -	$ -	$9,600
Capital Expense Subtotal	$30,840	$ -	$ -	$ -	**$30,840**
Operating Expenses					
Stroke Coordinator Module Training *	$6,840	$3,420	$3,420	$3,420	$17,100
Data fees**	$1,900	$1,900	$1,900	$1,900	$7,600
Operating Expense Sub Total	$8,740	$ -	$ -	$ -	$53,590
Total Program Costs	**$39,580**	$5,320	$5,320	$5,320	**$55,540**

* Module training beginning in operational period is calculated to be completed in 2 hours x 19 Stroke Coordinators X $90/hr with subsequent annual refresher training
**Annual data fee at $100/facility x 19 out of 21 licensed hospitals

(Regional Portal & MS TEAMS site)

	Planning Period	Operational Period			
	2020	2021	2022	2023	Total
Capital Expense					
Project Developer	$18,000	$ -	$ -	$ -	$18,000
Regional Stroke Coordinator Liaison Consultation	$1,800	$ -	$ -	$ -	$1,800
Seasoned Stroke Coordinator x 2 members	$1,440	$ -	$ -	$ -	$1,440
Regional Education Consultation	$ -	$ -	$ -	$ -	$0
Capital Expense Subtotal	$21,240	$ -	$ -	$ -	**$21,240**
Operating Expenses					
Stroke Coordinator Module Training *	$6,840	$3,420	$3,420	$3,420	$17,100
Data fees**	$ -	$ -	$ -	$ -	$0
Operating Expense Sub Total	$6,840	$ -	$ -	$ -	$6,840
Total Program Costs	**$28,080**	$3,420	$3,420	$3,420	**$38,340**

* Module training beginning in operational period is calculated to be completed in 2 hours x 19 Stroke Coordinators X $90/hr with subsequent annual refresher training

Appendix L

Online Self-Learning TJC DSC Module Evaluation Survey

Please give us your feedback regarding the module. Thank you for your participation.

(5= Strongly agree, 4= Agree, 3= Neutral, 4= Disagree, 5=Strongly disagree).

1. The module provided necessary information to increase my knowledge to prepare for the TJC certification survey.
   ☐1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree
2. The online self-learning module is an alternative educational format that will allow me to access it anytime as a reference tool.
   ☐1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree
3. The self-learning module allowed me to pace myself to complete it.
   ☐1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree
4. After completing the module, it improved my knowledge on how to complete a standard risk assessment in identifying an area for improvement and placing it on the Survey Analysis for Evaluating Risk (SAFER) matrix according to the likelihood to harm a patient, staff, or visitor and the prevalence of the problem.
   ☐1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree
5. I found the supplementary resources/links/references/tools helpful.
   ☐1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree
6. What did you find the MOST helpful aspect of the module:

_____

_____

7. What did you find the LEAST helpful aspect of the module:

_____

_____

8. Suggestions on what other topics we can include in the module to assist you in preparation for the TJC certification survey:

_____

_____

Appendix M

Subject Matter Expert Survey

Kaiser Permanente

Seasoned Stroke Coordinator Survey/Interview- 7/2/19

1. Please choose your location:

☐ANT	☐RCH	☐SLN	☒VAC
☐FRE	☐ROS	☐SRF	☒VAL
☐FRS	☐RWC	☐SRO	☐WCH
☐MAN	☐SAC	☐SSC	
☐MOD	☐SCL	☐SSF	
☐OAK	☐SFO	☐SJO	

2. How long have you been in your role as a Stroke Coordinator at KP?
   6 years

3. Did you have any experience as a Stroke Coordinator outside of KP?
   No- I was working for Accreditation, Regulation, and Licensing (AR&L) department

   If YES, for how long? *Not applicable*

4. How many TJC recertification surveys have you prepared for at KP? *6 years, I am the Stroke Coordinator for both Vacaville and Vallejo medical centers.*

   And outside KP? *Not applicable*

5. How were you trained for TJC DSC survey recertification?

   I had no formal training. I learned on the job. I was working under AR&L so I am familiar with how to read and interpret the standards and elements of performance.

6. What are the areas that you think should be incorporated in the TJC DSC survey preparedness?
   I created a Primary Stroke Center driver diagram which dictates why certification is important. Since I get a lot of questions from new SC, data seems to be a big gap. They need to know how data is collected, what type of data is needed, and where it can be pulled (know the methodology). Know the different types of stroke reports that is already available (i.e.., Quintiles/Outcome Science, STATIT, ED dashboard, MIDAS). Patient satisfaction is still a gap on how to collect it. Also need to know the criteria for the AHA award. Build a good relationship with the entire team including the AHA representatives. Background on Evidence of Standard compliance may also be needed if there are findings. Background on basic pathophysiology. Know who is working the day of the survey (work with Staffing dept). Create a stroke survey readiness handout, tip sheet before day of survey (who is working behind the scene, assign on who will be checking the stroke charts for standard compliance/performance measures, assign who will be navigating the electronic medical record for the surveyor), prepare the staff on what to say/respond to the surveyor, and check the stroke portal for existing information.

7. The training module will assist in training the new stroke coordinators.
   ☒1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree

8. Participating in the training module development was valuable.
   ☒1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree

Kaiser Permanente

Seasoned Stroke Coordinator Survey/Interview- 6/27/19

1. Please choose your location:

☐ANT	☐RCH	☐SLN	☐VAC
☐FRE	☐ROS	☐SRF	☐VAL
☐FRS	☐RWC	☐SRO	☐WCH
☐MAN	☐SAC	☐SSC	
☐MOD	☐SCL	☒SSF	
☐OAK	☐SFO	☐SJO	

2. How long have you been in your role as a Stroke Coordinator at KP?
   2 ½ years

3. Did you have any experience as a Stroke Coordinator outside of KP?
   No- I was the ICU Clinical Educator. The SC role was transitioned to Patient Care Services and decided to take it. I have been involved with the Stroke Program as a member of the Stroke Committee all along but as the ICU Educator who is assigned to train the staff on stroke.

   If YES, for how long? *Not applicable*

4. How many TJC recertification survey have you prepared for at KP? *Going on my 3rd year*

   And outside KP? *Not applicable*

5. How were you trained for TJC DSC survey recertification?

   I was trained by the outgoing Stroke Coordinator and luckily, it was during the certification survey. I shadowed him, and he oriented me to the entire program and certification process.

6. What are the areas that you think should be incorporated in the TJC DSC survey preparedness?
   Clinical practice guideline is a must, review program description/charter annually, P&P review, education of staff and providers, fyi for patient education materials, review of order sets, HR/Credentialing and Privileging, Literature reviews/recent articles on stroke, conferences, how to collect the data, review fall outs with managers, rounding on stroke patients and talking with frontline staff on the performance measures. Building relationships with the stroke interdisciplinary team is improve, be visible.

7. The training module will assist in training the new stroke coordinators.
   ☒1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree

8. Participating in the training module development was valuable.
   ☒1. Strongly agree ☐2. Agree ☐3. Neutral ☐4. Disagree ☐5. Strongly disagree

Appendix N

Online Self-Learning TJC DSC Post-Module Assessment

1. What is the advantage of achieving the TJC recognition as a Stroke Primary Center?
   a. Improves the quality of patient care by reducing variation in clinical processes
   b. Creates a loyal, cohesive clinical team and provides an opportunity for staff to develop their skills and knowledge
   c. Creates an environment of continuous improvement
   d. All of the above

2. What is the role of the Stroke Coordinator in the survey preparation and maintaining the certification?
   a. Provides directions on how to complete the educational activities
   b. Coordinates and manages the stroke program in partnership with the stroke interdisciplinary team
   c. Leads the presentations during the survey
   d. Completes the performance improvement data

3. During the onsite survey, if there is no stroke patient to review, what type of patients should you provide?
   a. Ischemic stroke patients for the past 3-4 months
   b. Ischemic and hemorrhagic stroke patients for the past 12 months
   c. Ischemic, hemorrhagic, TIA, including patients who received Alteplase the last 4-12 months
   d. Ischemic, hemorrhagic, and TIA patients for the past 4-12 months
   e. None of the above

4. What is the purpose of the tracer activity?
   a. To observe the environment and assess compliance to risk standards
   b. To assess the adherence and diversion from the clinical practice guidelines
   c. To review the policy and procedures and verify the care process
   d. A & C
   e. B & C

5. What data can you share during the data session?
   a. Performance improvement plan, medication management, infection prevention
   b. Performance improvement plan, patient satisfaction plan, annotated outlier with confidential patient data
   c. Performance improvement plan, data variances as it pertains to staff competency, infection prevention
   d. Performance improvement plan, patient satisfaction plan, patient safety risk event

6. What is an intra-cycle evaluation?
   a. To review performance measures data and standards compliance
   b. To evaluate the performance improvement plan and data entered in the Certification Measure Information Process (CMIP) tool
   c. To assess the medical center's compliance with the clinical practice guidelines and standards
   d. To review performance improvement activities and compliance with the standards entered in the Certification Measure Information Process (CMIP) tool

7. Which standard addresses patient satisfaction?
   a. Delivering or Facilitating Clinical Care (DSDF)
   b. Supporting Self-Management (DSSE)
   c. Clinical Information Management (DSCT)
   d. Performance Measurement (DSPM)

8. Delivering or Facilitating Clinical Care (DSDF) standard focuses on _____.
   a. Providing safe and adequate access to care
   b. Maintaining data quality and integrity
   c. Assessing patients' self-management capabilities
   d. Providing care using evidence-based clinical practice guidelines

9. Where would you place this Requirement for Improvement on the SAFER matrix:
   In 1 of 4 records reviewed, the program did not meet the patient's needs for reassessments per chosen clinical practice guidelines as evidenced by one set of VS missing after the administration of Alteplase at 1700. VS were present at 1638 and 1730.

   a. Low Limited
   b. Moderate Limited
   c. Low Pattern
   d. Moderate Pattern

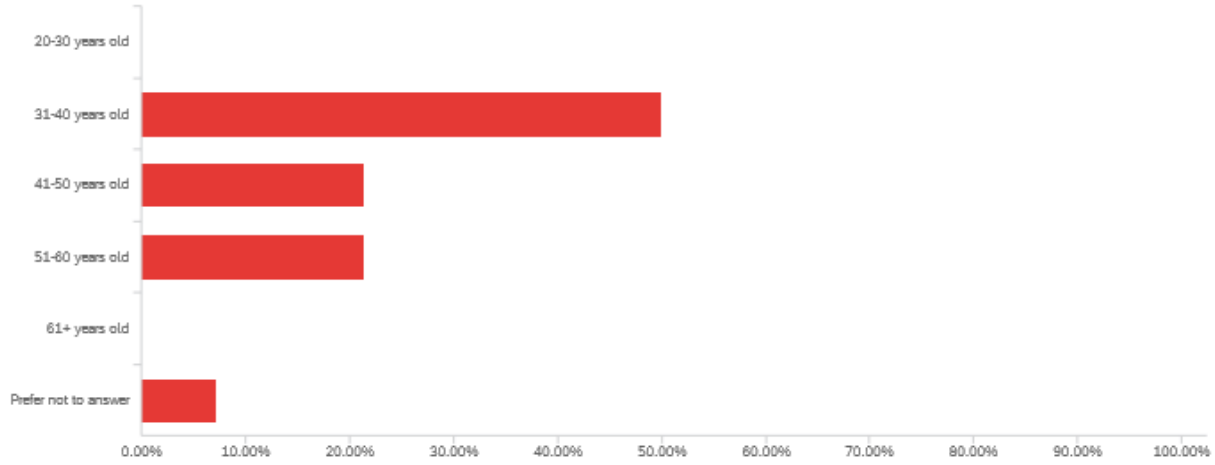
10. What is required to complete and submit when a Requirement for Improvement was cited after a survey?
    a. The medical center is required to complete an Evidence of Standard Compliance and submit it within 60 days
    b. The medical center needs to submit a Requirement for Improvement clarification within 10 business days
    c. The medical center provides supplemental documentation to correct the non-compliance
    d. The medical center needs to submit a preventive root cause analysis to address the finding

Appendix O

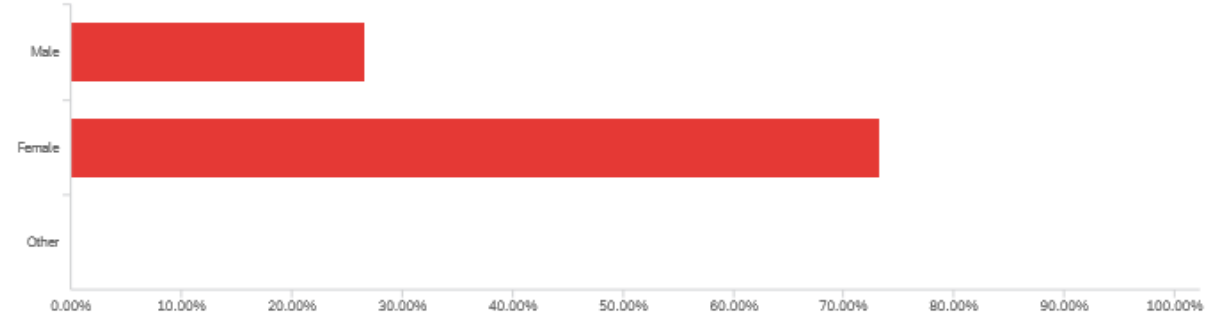
Participant Demographic Survey

Participant Demographics (*n* = 15)

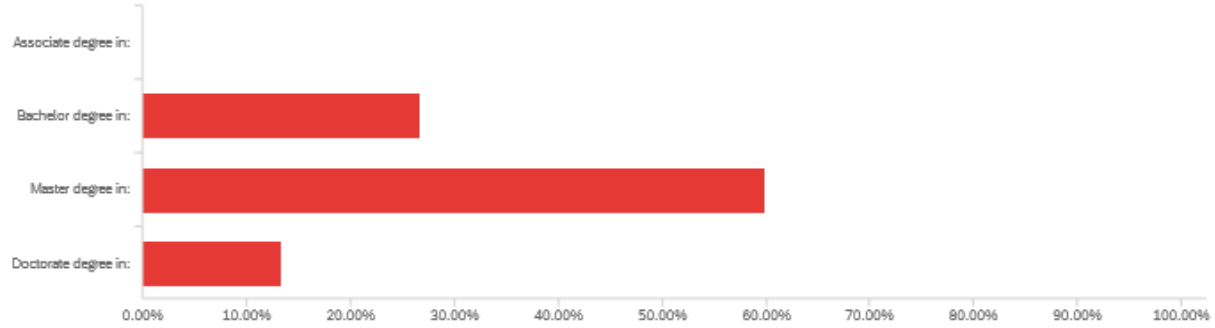
Q1 - Age?



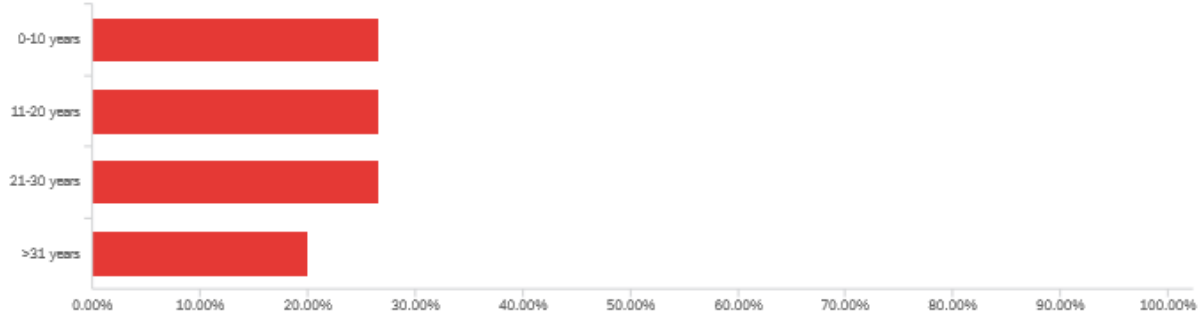
Q2 - Gender?



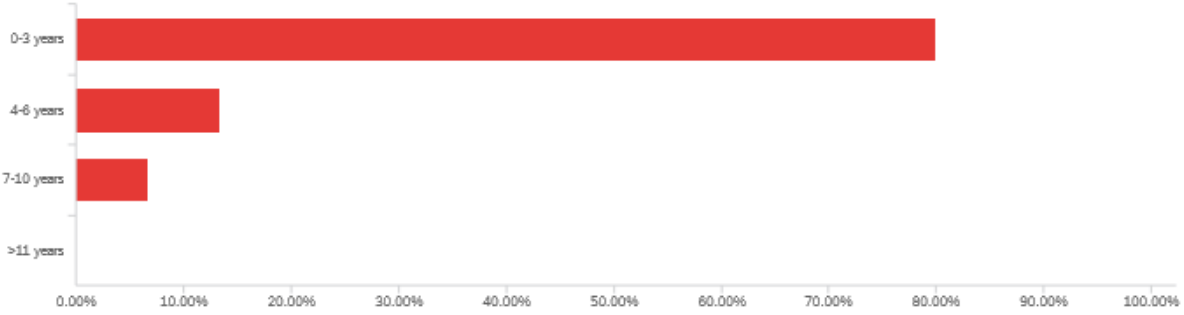
Q3 - Highest level of education?



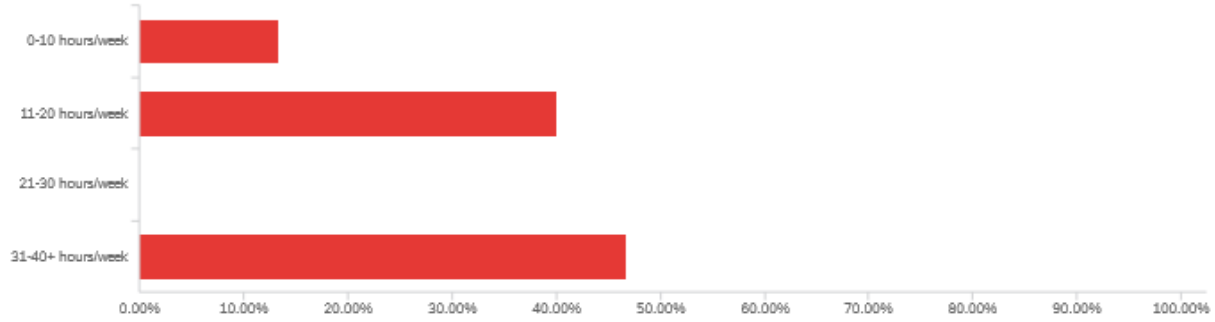
Q4 - Number of years as a Registered Nurse?



Q5 - Number of years as a Stroke Coordinator?



Q6 - Number of hours/week dedicated to Stroke Coordinator role?



Q7 - Please list your other role(s) or functions that you support, in addition, to Stroke Coordinator role, if applicable.

Please list your other role(s) or functions that you support, in addition,...
Quality
Risk, Peer/Dept Review, Quality Improvement
sepsis coordinator
HAP & Patient rounding (quality support to PCS)
Sepsis Coordinator
Tele manager
Assistant Nurse Manager
Sepsis Coordinator
Sepsis, NICHE, Quality Nurse Project Coordinator
Clinical Nurse Specialist for Critical Care, Delirium Lead
Infection Prevention 50%
Quality and Regulatory oversight
Comprehensive Stroke Center Stroke Coordinator. Quality Nurse Consultant with ICU as my direct service line. Focusing on total harm events, reduction of HAI's. Support for TJC, CDPH, CPA, and other regulatory surveys.

Appendix P

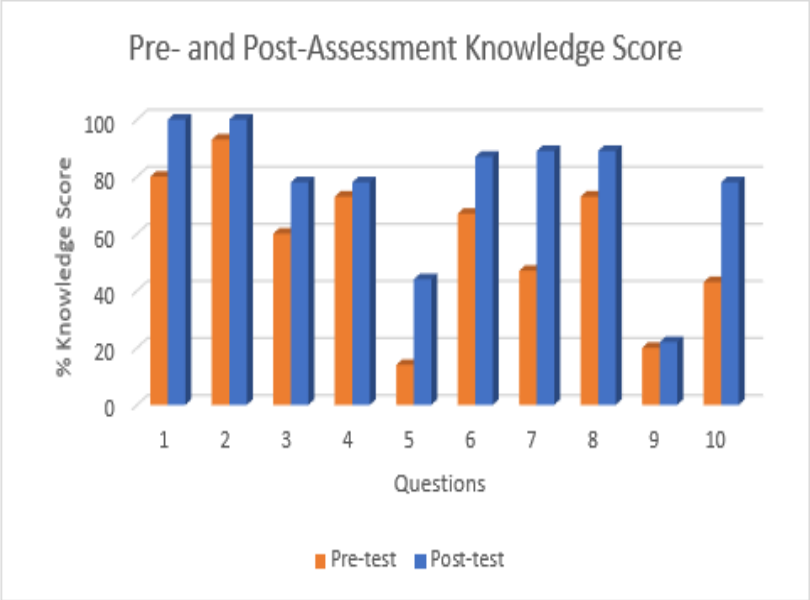
Survey Results

All Stroke Coordinators

Pre- and Post-Assessment Knowledge Score

N=15

Question	Pre-test	Post-test	% variance
1	80	100	20
2	93	100	7
3	60	78	18
4	73	78	5
5	14	44	30
6	67	87	20
7	47	89	42
8	73	89	16
9	20	22	2
10	43	78	35
Average	57%	76.5%	19.5%



1. What is the advantage of achieving the TJC recognition as a Stroke Primary Center?
2. What is the role of the Stroke Coordinator in the survey preparation and maintaining the certification?
3. During the onsite survey, if there is no stroke patient to review, what type of patients should you provide?
4. What is the purpose of the tracer activity?
5. What data can you share during the data session?
6. What is an intracycle evaluation?
7. Which standard addresses patient satisfaction?
8. Delivering or Facilitating Clinical Care (DSDF) standard focuses on
9. Where would you place this Requirement for Improvement on the SAFER matrix:
10. What is required to complete and submit when a Requirement for Improvement was cited after a survey?

Appendix Q

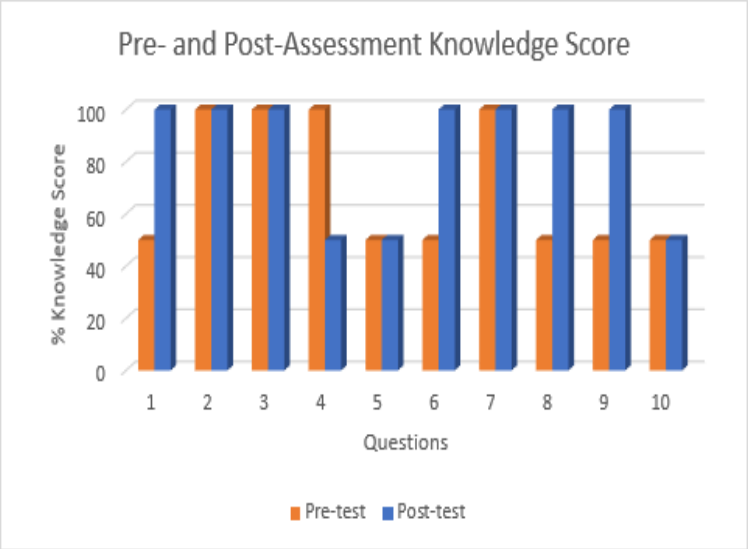
Focus Group Survey Results

Focus Group of Stroke Coordinator

Pre- and Post-Assessment Knowledge Score

N=2

Question	Pre-test	Post-test	% variance
1	50	100	50
2	100	100	0
3	100	100	0
4	100	50	-50
5	50	50	0
6	50	100	50
7	100	100	0
8	50	100	50
9	50	100	50
10	50	50	0
Average	70	85	15



1. What is the advantage of achieving the TJC recognition as a Stroke Primary Center?
2. What is the role of the Stroke Coordinator in the survey preparation and maintaining the certification?
3. During the onsite survey, if there is no stroke patient to review, what type of patients should you provide?
4. What is the purpose of the tracer activity?
5. What data can you share during the data session?
6. What is an intracycle evaluation?
7. Which standard addresses patient satisfaction?
8. Delivering or Facilitating Clinical Care (DSDF) standard focuses on
9. Where would you place this Requirement for Improvement on the SAFER matrix:
10. What is required to complete and submit when a Requirement for Improvement was cited after a survey?

Appendix R

Signed Statement of Non-Research Determination Form

UNIVERSITY OF SAN FRANCISCO | School of Nursing and Health Professions

DNP Statement of Non-Research Determination Form

Student Name: Winchell Kuttner

Title of Project:

Online self-directed learning module for a successful stroke certification survey

Brief Description of Project:

The development of tools and resources have been identified to address the current educational gap in the orientation of a Stroke Coordinator. The lack of dedicated time for Stroke Coordinators to focus on The Joint Commission (TJC) standards in preparation for the Disease-Specific Standard certification survey every two years has led to stressful last-minute preparation and burnout. The Stroke Coordinator's training consists of a handoff from the prior Stroke Coordinator, review of role expectations from the Quality Director, and an overview of the program from the Regional Stroke Coordinator Liaison. Due to multiple priorities within the Quality Department, the Stroke Coordinator prioritizes her workload based on deadlines. As a result, the focus on survey preparation is deferred until the certification year when TJC is expected to arrive. The online self-directed format is an alternative method to train a new Stroke Coordinator. A preliminary literature review suggests evidence-based self-learning modules as useful tools to enhance learning (Wu, Chan, Tan, and Wang, 2017; Tohidi, KarimiMoonaghi, Shayan, and Ahmadinia, 2019; Keis, Grab, Schneider, and Ochsner, 2017).

An innovative teaching method such as self-directed modules has emerged as an alternative approach to deliver education. The principles of Malcolm Knowle's andragogical model or adult learning will be applied to the Stroke Coordinators role and learning development using an online self-directed module. The six principles are the self-concept of a self-directed learner, the relevance of the need to learn, readiness and timing as essential learning aspects, the learners' experiences as an adult, application of learning to a real-life situation, and learning motivation (Knowles, Swanson, & Holton, 2005). Online self-directed learning modules are effective ways to promote active, independent learning and still meet the learning goals and objectives.

The subsequent studies found that a self-directed online format can have a similar outcome compared to a traditional teaching method, which includes a face-to-face meeting or classroom delivery.

Wu et al. (2017) found that the uniqueness of online training was preferred due to its accessibility, flexibility, and created an online community for interaction. Self-directed modules can be utilized to teach identical content offered in a conventional approach using an online format. Tohidi et al. (2019) conducted a randomized study showed that the self-learning module was as effective as the classroom setting in improving the

students' clinical skill competency. Numerous advantages support this practice which includes flexibility of when the learner has the time to complete the module, ability to pace oneself, ease of access, and cost-effective. Keis et al. (2017) obtained the students' perspectives on the online format and face-to-face course, which supported the advantages of the ability to access the module anytime and anywhere, complete it at one's speed, and repeat the content without time limitation.

In summary, studies revealed that self-directed learning format has positive educational outcomes and can be utilized to improve the knowledge of the Stroke Coordinators. The availability of online technology is a modern platform to train staff with a hectic schedule. It is a successful teaching practice that is effective in staff education.

A) Aim Statement:

The aim of the project is to develop, implement and evaluate a competency-based stroke coordinator program. It is a proactive regional approach to improve the competency of the Stroke Coordinators on the disease-specific standards. An improved knowledge on the requirements will lead to better standard adherence and certification outcomes for the Northern California medical centers.

The main objectives include:

1. Develop a certification survey preparedness module for Stroke Coordinators that will be easily accessible on the Northern California Regional Stroke portal.
2. To increase the knowledge on the certification standards and requirements of stroke coordinators from pre-intervention score to 20% post-intervention score, by August 2020 among Stroke Coordinators within the Northern California region.
3. To increase the understanding of Survey Analysis for Evaluating Risk (SAFER) matrix by correctly placing a Requirement for Improvement on the grid from pre-intervention score to 20% post-intervention score, by August 2020, among Stroke Coordinators within the Northern California region.

B) Description of Intervention:

The online self-learning module will include a survey preparation checklist and content of the TJC stroke standards and requirements. Two seasoned Stroke Coordinators will be interviewed to receive their expert opinions of the critical aspects of TJC stroke certification survey readiness. The feedback will serve as a guide in content development. A short quiz at the end of each main topic will be developed to ensure participant engagement and knowledge attainment throughout the module. The training module will be entered in a PowerPoint presentation with supplementary resources such as attachments of the clinical practice guideline, TJC Disease-Specific Care process guide, and other vital links for TJC survey readiness. The self-learning module will be made available on the Northern California Regional Stroke portal where it can be easily accessible at any time by the Stroke Coordinators for reference.

Stroke Coordinators from 21 medical centers will be recruited to complete the demographic data and assessment questionnaire with an expectation to return them within one week via Survey Monkey. After completion of the pre-test questionnaire, the module will be provided with a post-test questionnaire and completed within two weeks. A follow-up phone call, email, and attending one of the quarterly Regional stroke meetings will be utilized to ensure participation from the Stroke Coordinators. An incentive to complete the survey will include a grand prize raffle drawing. A qualitative survey will be sent via Survey Monkey to evaluate the participants' perception of the effectiveness of the module.

Descriptive variables will include age, gender, level of education, number of years as a Registered Nurse, number of years as a Stroke Coordinator, and amount of time dedicated to Stroke Coordinator role. The variables which may impact the knowledge scores are years of experience as a Stroke Coordinator and the number of hours spent per week dedicated to Stroke Coordinator role. Knowledge scores will be evaluated by comparing pre- and post-test scores after the completion of the module.

C) How will this intervention change practice?

A standardized teaching approach of the disease-specific certification standards provided to the 21 medical centers will eliminate variation in the interpretation of the standards, and thus ensure safe care delivery of stroke patients. The online platform offers an alternative learning method for Stroke Coordinators who are faced with time commitment and workload challenges. This type of teaching style is easily accessible at any time and cost-effective. The self-directed learning module will be used as part of the orientation training expectation of the Stroke Coordinators.

D) Outcome measurements:

- To develop a regional standardized online self-directed training module
- To increase the knowledge of Stroke Coordinators of the certification standards and requirements.

To qualify as an Evidence-based Change in Practice Project, rather than a Research Project, the criteria outlined in federal guidelines will be used: (http://answers.hhs.gov/ohrp/categories/1569)

X This project meets the guidelines for an Evidence-based Change in Practice Project as outlined in the Project Checklist (attached). Student may proceed with implementation.

☐This project involves research with human subjects and must be submitted for IRB approval before project activity can commence.

Comments:

EVIDENCE-BASED CHANGE OF PRACTICE PROJECT CHECKLIST *

Instructions: Answer YES or NO to each of the following statements:

Project Title:	**YES**	**NO**
The aim of the project is to improve the process or delivery of care with established/ accepted standards, or to implement evidence-based change. There is no intention of using the data for research purposes.	X	
The specific aim is to improve performance on a specific service or program and **is a part of usual care**. ALL participants will receive standard of care.	X	
The project is **NOT** designed to follow a research design, e.g., hypothesis testing or group comparison, randomization, control groups, prospective comparison groups, cross-sectional, case control). The project does **NOT** follow a protocol that overrides clinical decision-making.	X	
The project involves implementation of established and tested quality standards and/or systematic monitoring, assessment or evaluation of the organization to ensure that existing quality standards are being met. The project does **NOT** develop paradigms or untested methods or new untested standards.	X	
The project involves implementation of care practices and interventions that are consensus-based or evidence-based. The project does **NOT** seek to test an intervention that is beyond current science and experience.	X	
The project is conducted by staff where the project will take place and involves staff who are working at an agency that has an agreement with USF SONHP.	X	
The project has **NO** funding from federal agencies or research-focused organizations and is not receiving funding for implementation research.	X	
The agency or clinical practice unit agrees that this is a project that will be implemented to improve the process or delivery of care, i.e., **not** a personal research project that is dependent upon the voluntary participation of colleagues, students and/ or patients.	X	
If there is an intent to, or possibility of publishing your work, you and supervising faculty and the agency oversight committee are comfortable with the following statement in your methods section: *"This project was undertaken as an Evidence-based change of practice project at X hospital or agency and as such was not formally supervised by the Institutional Review Board."*	**X**	

ANSWER KEY: If the answer to **ALL** of these items is yes, the project can be considered an Evidence-based activity that does NOT meet the definition of research. **IRB review is not required. Keep a copy of this checklist in your files.** If the answer to ANY of these questions is **NO**, you must submit for IRB approval.

*Adapted with permission of Elizabeth L. Hohmann, MD, Director and Chair, Partners Human Research Committee, Partners Health System, Boston, MA.

STUDENT NAME (Please print):
Winchell Kuttner
Signature of Student: Winchell Kuttner (electronic signature) **DATE** 8/20/19

SUPERVISING FACULTY MEMBER (CHAIR) NAME (Please print):
Dr. Mary Bittner
Signature of Supervising Faculty Member (Chair):
Dr. Mary Bittner (electronic signature) **DATE** 8/20/19

Appendix S

Form and IRB Approval Documents

Not Human Subjects Research Determination

When complete, submit this form to the Research Determination Committee via email: KPNC-RDO@kp.org

Please provide a response to each of the following questions. Indicate N/A where items is not applicable

In your response, please include any information sheets that will be distributed to the participants.

Name: Winchell Kuttner Winchell Kuttner, RN, MSN, CPHQ Clinical Quality & Risk Director Kaiser Fremont Medical Center Office (510) 248-3928 Cell (510) 921-1769
Project Title: Online self-directed learning for disease-specific care certification: a proactive approach for improved regional stroke coordination performance
Principal Investigator: Winchell Kuttner
Contact information: 510-921-1769 (cell); office 510-248-3928
Notes: I am Winchell Kuttner, the Fremont Clinical Quality and Risk Director. I am currently enrolled at the University of San Francisco in their Executive Leadership Doctorate of Nursing Program (DNP). I am writing to request your approval of my DNP Performance Improvement Project on self-directed learning module for our Stroke Coordinators.
Tracking number (To be filled in by the RDO) : RDO KPNC 19 - 118

1. Purpose, specific aims and/or objectives

The aim of the project is to develop a proactive regional approach to improve the competency of the Stroke Coordinators on the disease-specific standards. An improved knowledge on the requirements will lead to better standard adherence and certification outcomes for the Northern California medical centers. This project has been endorsed and approved by Melissa Meighan, DNP, MSN, RN, Regional Stroke Coordinator and Clinical Practice Consultant who has the oversight of the Stroke Coordinators.

The main objectives include:

1. Develop a certification survey preparedness module for Stroke Coordinators that will be easily accessible on the Northern California Regional Stroke portal.
2. To increase the knowledge on the certification standards and requirements from pre-intervention score to 20% post-intervention score, by December 2019, among Stroke Coordinators within the Northern California region.
3. To increase the understanding of Survey Analysis for Evaluating Risk (SAFER) matrix by correctly placing a Requirement for Improvement on the grid from pre-intervention score to 20% post-intervention score, by December 2019, among Stroke Coordinators within the Northern California region.

2. Target population

Kaiser Permanente Northern California Nurse Stroke Coordinators in Northern California. Currently, there are approximately 16 Stroke Coordinators. The pre-knowledge test will be administered on October 2019, and the online educational module and post-educational module test will be administered approximately mid-October to November 2019.

3. Procedures used to gather information
   a. Indicate if these procedures would be conducted as part of standard of care, regardless of the proposed activity.

The online self-directed learning module will be part of the current educational training for KPNC Stroke Coordinators.

4. Description of the data/samples gathered about individuals including names of datasets, URL, etc.
   a. What data/samples will be collected, how and by whom the data will be analyzed.

Age, gender, level of education, number of years as a Registered Nurse, number of years as a Stroke Coordinator, and amount of time dedicated to Stroke Coordinator role will be collected through an electronic survey software. The survey will be voluntary and anonymous no individual identifiers linked to the participants. A pre- and post-knowledge score evaluation composed of 10-item multiple-choice test and an 8-item questionnaire of the perception of the effectiveness of the module will be completed by the participants. The University of San Francisco (USF) student/principal investigator (Winchell Kuttner) will analyze the data comparing the knowledge score gained by the participants after completing the module.

   b. How will/were the data/samples gathered from individuals? (e.g., obtained as part of an IRB approved protocol or as part of routine clinical care)

A Statement of Non-Research Determination via USF has been submitted and approved by the USF Advisor. As mentioned, the data will be collected through an electronic survey software, Qualtrics. The survey link will be sent via email to the current regional Stroke Coordinator distribution list requesting for their participation of the quality improvement project. The survey will be voluntary and anonymous. The software will not be able to link the responses to the individual Stroke Coordinator. The data will be aggregated to look at absolute differences between pre- and post-module use of the Stroke Coordinators as a group, and not individually.

c. Can the collected data/samples be directly or indirectly associated/linked with individual identifiers?

There will be no individual identifiers linked to the participants. The pre and post training assessment surveys will be voluntary and anonymous.

d. Can others directly or indirectly associate/link the collected information with individual identifiers?

As mentioned, there will be no individual identifiers that can be traced back to the participants by the principal investigator or others. Additionally, the pre and post assessment surveys will be voluntary and anonymous.

5. Generalizability of project findings, or value of project findings

This project will address a regionally identified educational training gap by creating an online self-directed learning module to assist the KPNC Nurse Stroke Coordinators in knowledge acquisition of the standards and requirements. Literature review supports that self-directed learning module is a useful tool for staff education. An educational module provided regionally to the 21 medical centers will ensure standardized content information to provide effective and safe patient care by the interdisciplinary stroke team. A knowledgeable and competent Stroke Coordinator managing the program can facilitate a successful TJC certification survey and help the stroke team achieve excellent clinical outcomes.

Appendix T

Organization Letter of Support

KAISER PERMANENTE

August 28, 2019

To Whom It May Concern:

This letter is to state support for Winchell Kuttner to implement the Northern California Regional Stroke Coordinator online self-directed learning module evidence-based DNP improvement project at Kaiser Permanente.

The project aim is to develop a proactive regional approach to improve the competency of the Stroke Coordinators on the Disease-Specific Care standards. Improved knowledge of the requirements will lead to better standard adherence and certification outcomes for the Northern California medical centers.

The main objectives include:

1. Develop a certification survey preparedness module for Stroke Coordinators that will be easily accessible on the Northern California Regional Stroke portal.
2. To increase the knowledge on the certification standards and requirements from pre-intervention score to 20% post-intervention score, by December 2019, among Stroke Coordinators within the Northern California region.
3. To increase the understanding of Survey Analysis for Evaluating Risk (SAFER) matrix by correctly placing a Requirement for Improvement on the grid from pre-intervention score to 20% post-intervention score, by December 2019, among Stroke Coordinators within the Northern California region.

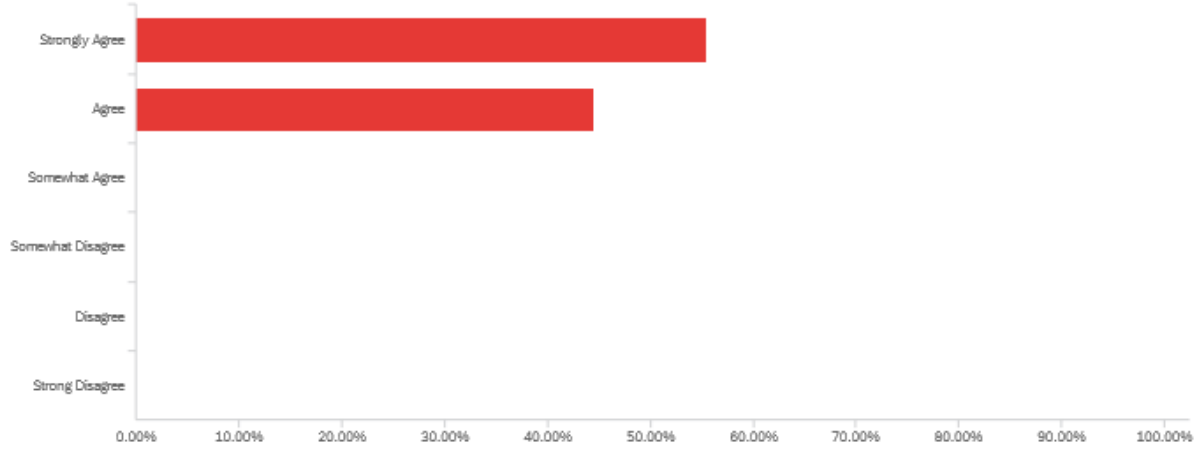
Thank you for consideration,

Melissa M. Meighan, DNP, MS, RN, CNRN, SCRN, NEA-bc
Regional Stroke Coordinator/Clinical Practice Consultant
Regional Quality, Accreditation, Regulation & Licensing Department
1950 Franklin Street, Oakland, CA. 94612
Kaiser Foundation Hospitals
Office: (510) 510-987-3433/Tie Line: 8-427
Fax: (510) 987-3548
Cell: (510) 301-5177
E-mail: Melissa.m.meighan@kp.org

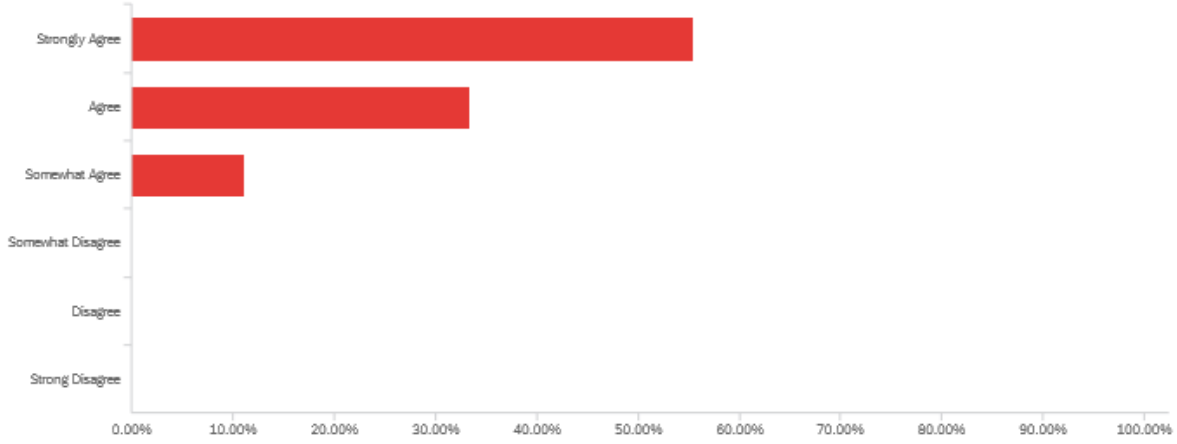
Appendix U

Module Participant Evaluation

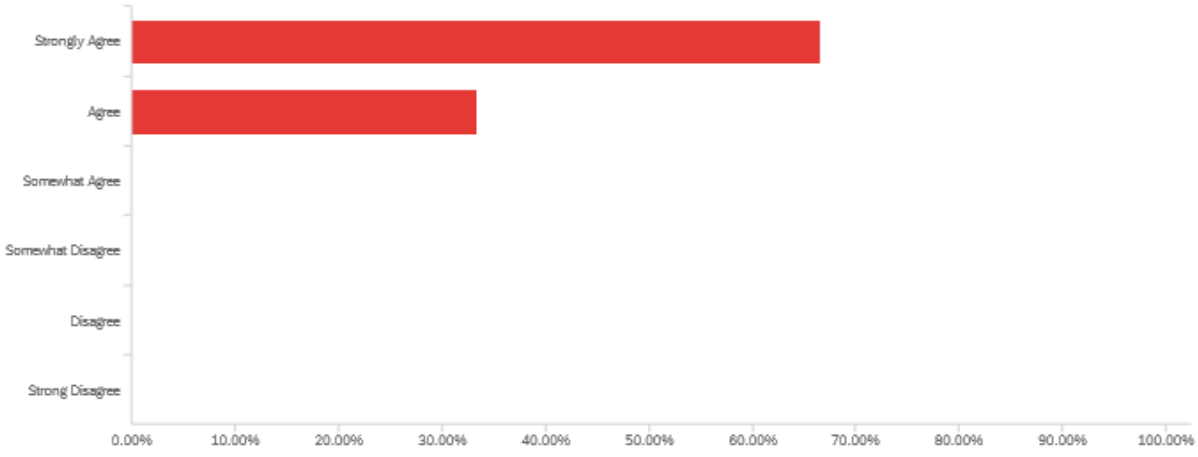
Q11 - The module provided necessary information that will assist a Stroke Coordinator gain knowledge to prepare for the TJC certification survey.



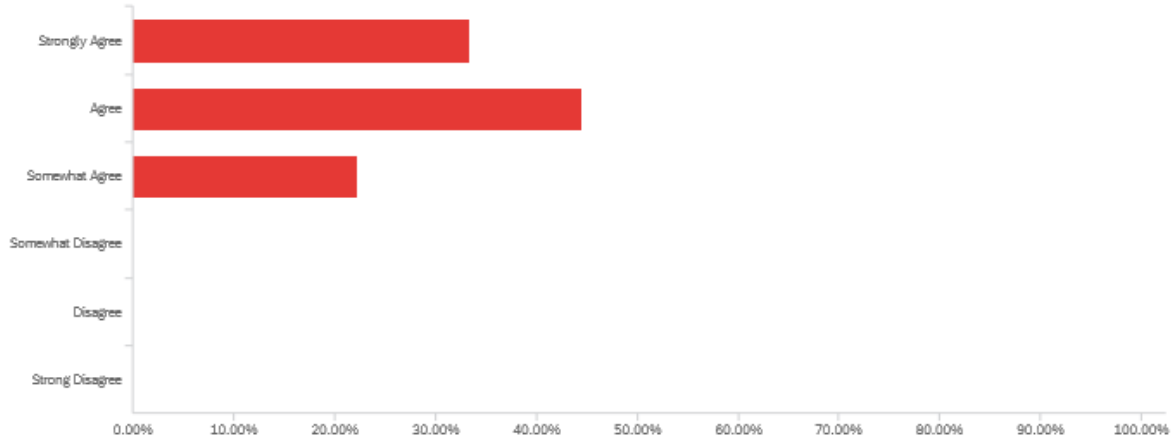
Q12 - The online self-learning module is an alternative educational format that will allow me to access it anytime as a reference tool.



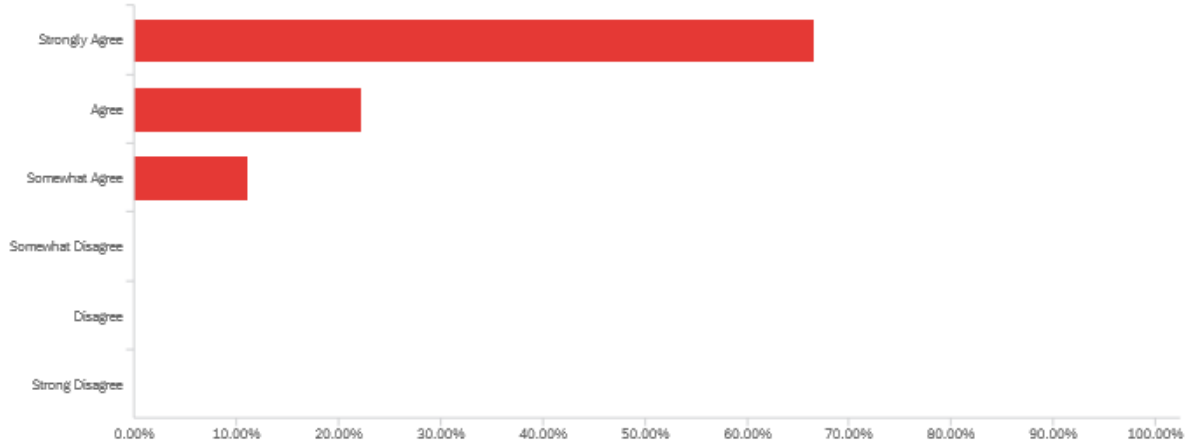
Q13 - The self-learning module allowed me to pace myself to complete it.



Q14 - The module helped me to think independently about how to prepare for the stroke certification survey.



Q15 - I found the supplementary resources/links/references/tools helpful.



Q16 - What did you find the MOST helpful aspect of the module:

It was informative, everything, survey checklist, check your undestanding questions, the resources and concise review of the standards, timeline and tools, practice understanding

Q17 - What did you find the LEAST helpful aspect of the module:

A lot of information to retain, need to be interactive