

Effect of Patient Handoff Methods on Nurse Self-Efficacy

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Executive Summary

1. Patients experience multiple transitions in care between nursing providers (handoffs) during hospitalization. Handoffs are opportunities for communication errors to occur.
2. Patient handoffs between the post-anesthesia care unit (PACU) to the nursing division is a frequent event within hospitals. Methods of handoff vary in practice from face-to-face, telephone, or written report.
3. Nurses receiving patient handoff may experience varying degrees of self-efficacy levels in providing care to the newly acquired patient from the PACU. Self-efficacy levels can be measured utilizing the Nursing Care Self-Efficacy Scale (NCSES).
4. Variances in nursing self-efficacy scores among the methods of face-to-face and telephone patient handoff were analyzed within this project.
5. Educating PACU nursing staff on the five p's of handoff (patient information, plan of care, purpose, precautions, and problems) may improve self-efficacy scores with nurses receiving a post-operative patient.

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Effect of Patient Handoff Methods on Nurse Self-Efficacy

Chapter 1 - Partnership

Care transitions among different healthcare providers are common with hospitalization. Methods of care transition vary according to facility policies, practices, patient care division, healthcare provider, or upon patient acuity levels. Different methods of patient handoff potentially create varying degrees of nurse self-efficacy to provide care to a newly received patient.

Description of the Project

Background and Significance

Barnes-Jewish Hospital is a large academic facility with 1,200 beds, affiliated with Washington University School of Medicine in St. Louis, Missouri. Designated as a level one trauma center and transplant center, a variety of specialties are seen in the perioperative areas spanning over two campuses. In the year 2015, Barnes-Jewish Hospital performed over 41,000 surgical procedures. Greater than 140 surgeries are performed daily, mainly Monday through Friday. However, perioperative services are available 24 hours a day and seven days a week. Among the two campuses, the South campus provides care for an average of 80-100 patients per day between two floors (see Appendix A for flow processes in perioperative areas). A second-floor recovery area serves orthopedic, neurological, ear/nose/throat (ENT), gynecological, and colorectal procedures primarily. A third-floor recovery area serves mostly cardiothoracic, vascular, hepatobiliary and transplants. Several of these patients are admitted directly to intensive care units. Overall, a majority of patients go from the operating room to the post-anesthesia care unit (PACU). Average length of stay for most patients in the PACU is two hours.

After recovery from anesthesia, patients are sent to receiving nursing divisions. Patient handoff leaving the PACU may present challenges to the recovery nurse.

Perioperative services at Barnes-Jewish Hospital assumed the task of determining how to improve patient handoff processes within the hospital. Defined methods of handoff were formulated by several teams within the perioperative department. Education of all perioperative staff was done with the new handoff processes in late 2017. Elimination of written PACU to floor nursing reports was attempted by reliance on more telephone to floor handoffs. A reference guide was developed at Barnes-Jewish Hospital to serve as a tool for handoffs (see Appendix B for the handoff guide). Patient handoffs are considered high risk, error-prone, and potentially rife with technical and communication errors, especially within chaotic and complex environments such as intensive care units. Correlations were found between patient outcomes and handoffs (Segall et al., 2012). Poor communication during handoffs can prolong patient recovery time, precipitate dangerous complications, create omissions in care, and lead to patient, family, and nursing staff dissatisfaction (Dufault et al., 2010).

A responsibility of the PACU nurse is to provide a method of handoff to the receiving nurse upon transfer. The Joint Commission Center for Transforming Healthcare has defined the patient handoff as a real-time transfer and acceptance of information from one caregiver to another (Taylor, 2015). During the handoff transition phase from the PACU to the floor, communication is an essential component of safe, adequate care. Lack of research-based standards for handoff protocols and policies was identified. The National Quality Forum recommended that handoffs consist of a standardized approach, be timely, and understood (Dufault et al., 2010). The Joint Commission has considered this issue to be a public health policy issue (Dufault et al., 2010). National Patient Safety Goals (NPSG) stated that handoffs in

care should afford staff an opportunity to ask and respond to questions. Based on the variances in the three methods of handoffs used by the PACU, the handoff practices failed to meet the consistency criteria outlined by the National Quality Forum and the ability to ask and respond to questions as recommended by the NPSG when nurses used the written handoff method. Avoidance of the written handoff was suggested unless nursing staff could not reach the receiving nurse after multiple telephone attempts.

When examining the specific handoff practices, there were several considerations and potential issues presented by the different methods. One method involved telephone report between the PACU and receiving nurse. The most common challenge experienced with telephone handoff was locating the division nurse and that nurse being available for report. A second method utilized face-to-face handoff. Based on individual hospital policy, patients with obstructive sleep apnea precautions and requiring nursing escort with cardiac monitoring need face-to-face handoffs. Challenges with face-to-face handoff included the PACU nurse being away from the recovery area for up to 30 minutes and receiving another patient from the operating room while off the division. This scenario created a risk for the incoming patient as well as increased demand for colleagues covering for the nurse. Also, the covering nurse was burdened with an additional patient. Thus, being away from the PACU created circumstances for risk in a busy and high-acuity environment of the PACU. A written tool (see Appendix C for the handoff sheet) was the most commonly used method of handoff. With this technique, the patient was sent to the receiving nursing division with the handoff report sheet filled out, with no other action required on the part of the PACU nurse. Significant challenges experienced with written handoff included applicability of data on the handoff sheet, legibility, and essential information being absent from the document. Nurses on the receiving division faced time constraints and did

not have available time to review the handoff sheets. Handoff sheets inadvertently were lost in the transport phase of the patient to the floor. Nurses receiving the patient often had additional questions that required a telephone call to the PACU nurse for clarification. Evidence revealed the need for an improved patient handoff process at Barnes-Jewish Hospital that was timely, easy to perform, accurate, and safe. According to the Institute of Medicine (IOM), poor communication during handoffs has resulted in loss of life. The Joint Commission found in 2010 that miscommunication between caregivers contributed an estimated 80% of preventable adverse events in a hospital (Frankel et al., 2012). Patient handoffs are a significant point of vulnerability within the continuum of care, as millions of transitions in care occur each year (Halm, 2013). Ideally, the patient should be involved in the handoff process. Including patient involvement in the handoff process, there is a higher confidence level of the patient and family in feeling safe and secure, being kept informed of progress, and being an active participant in decision making. Patients and families also obtain a greater sense of how well the healthcare team works together (Dufault et al., 2010).

Problem Statement

The three methods of handoff employed in the transfer of PACU patients to receiving nursing divisions, created variances in how information was exchanged. With identified variations, likelihood of errors occurring with communication existed. Greater variance with information exchange methods theoretically could diminish the self-efficacy of the receiving nurse to provide safe care to the patient from the PACU. Anecdotal evidence at Barnes-Jewish Hospital indicated nurses preferred to receive either a face-to-face or telephone report. Many times, receiving nurses were finding the written handoff report sheets missing from the chart, indecipherable, or confusing. The level of evidence within nursing literature supported the face-

to-face handoff being correlated with a higher nurse and patient satisfaction. However, significant challenges with all patients having a face-to-face handoff at Barnes-Jewish Hospital included sheer volume of daily procedures performed, staff availability, and throughput processes. A reference tool was developed for handoffs (see Appendix B for the Barnes-Jewish Hospital handoff guide) that was very detailed and not consistently used by nursing staff. An easy to remember reference tool was an identified need for nursing staff. Pocket cards inclusive with the five p's of handoff were distributed to PACU staff (see Appendix D for the pocket reference card).

Hypothesis

Highest levels of nursing self-efficacy among division nurses receiving a patient from the PACU were postulated with face-to-face handoff. Lowest self-efficacy scores would be found among staff receiving a patient via the written handoff tool or with no type of handoff. Implementation of utilizing the five p's of handoff would potentially improve self-efficacy scores of floor nurses that received a patient from the PACU (see Appendix D for the pocket reference card).

Theoretical Framework

Orlando's Nursing Process Theory provided a component of the theoretical framework for this project. Orlando's conceptual model encompasses the role of the nurse assessing and meeting the patient's immediate need for help. Orlando's model is congruent with a medical-surgical nurse receiving a post-operative patient from the PACU. Immediate needs identified by the nurse may include nausea and pain control. In addition to physical needs, psychosocial needs may also be determined. Nurses must use their perception, thoughts about that knowledge, or the feeling created from their ideas, to assist the patient. Part of the nursing role is to discover and

meet immediate patient needs. The process of identifying the patient's immediate needs involves a handoff report. Nurse-to-nurse handoff assists the receiving nurse to determine physical and psychosocial needs of the patient being received. Self-efficacy or confidence levels of the nurse in meeting the needs of the received patient are an essential component for care.

Nurses receiving a patient handoff via telephone or written format theoretically experience lower levels of self-efficacy when providing patient care. Written and telephone reports may contain bias on the part of the sending nurse. Various types of format may not include all details required to make an accurate assessment of what is indeed happening with that patient. Face-to-face handoff allows for a higher level of nursing assessment to identify immediate physical and psychosocial needs of the patient. Involvement of the PACU and division nurse with the patient engages all senses: visual, auditory, tactile, and olfactory to identify immediate needs of a patient. Telephone and written handoff tools do not allow for direct involvement of the patient to participate in the handoff process before arrival to the division. Nurses are unable to directly visualize the patient in real-time with written or telephone handoff. Patient conditions may have changed from the time telephone report was received. Also, the written description may not reflect the status of the patient that may have changed within the time interval of traveling to the floor. Written statements may be lacking or contain inaccurate information. Written report sheets could also be indecipherable depending upon the sending nurse's handwriting style. As in the example of other forms of written communication, real meaning or intent of the author of the handoff written report cannot be fully known. Subtle nuances could be missed. Theoretically, missed information may lead to lower levels of nursing self-efficacy within the receiving nurse.

Watson's Theory of Human Caring was also applicable to the experience of nurse self-efficacy gained through efficient patient handoffs. Watson defined self-efficacy as an ability to organize motivation, cognitive resources, and courses of action required to be in command of a situation (Reid, Courtney, & Anderson, 2014). Encapsulated within Watson's Theory, a nurse's ability to develop and continue therapeutic relationships with patients is essential (Reid et al., 2014). Theoretically, telephone and written report handoff impair the strength of the nurse to develop an immediate therapeutic relationship, unlike the situation found in the face-to-face handoff method. During the face-to-face handoff, two nurses and the patient interact immediately within the new environment. Research has shown a relationship between nurse self-efficacy and professional practice behaviors (Manojlovich, 2005). Professional practice behaviors delineated within Watson's Theory correlate with the method of patient handoff experienced upon receiving a new patient from the PACU.

Watson's Theory of Human Caring creates a conceptual basis for patient-centered care (PCC). Watson (2012) felt caring in nursing was related to intersubjective human responses, environmental and personal interactions, knowledge of the nursing process, and self-knowledge. The nurse/patient relationship opens up access to higher dimensions of caring and healing. Within Watson's value system, emphasis was placed on helping a person gain more self-knowledge, self-control, self-caring, and inner healing of self. The nurse was viewed as a co-participant in the human caring-healing process. High value was placed on the nurse/patient relationship (Watson, 2012). Orlando's Theory is congruent with Watson's immediate focus of the nurse being upon patient experience and emphasizing that the patient can only singularly verify their experience in that moment (Schmieding, 1993). According to Orlando, nurses sometimes base their care upon assumptions based within a diagnostic label. Bias has potential

to come into play with written or telephone reports. Face-to-face handoffs allow the nurse to immediately assess the patient without preconceptions shared by another nurse (Schmieding, 1993). All senses of the nurse are involved within this interaction. Orlando specified that both patient and nurse participated in an exploratory communication process to identify the problem, as well as a solution (Schmieding, 1993). Congruency is present with Watson's Theory that emphasizes caring can only be demonstrated efficiently and practiced interpersonally (Watson, 2012).

Moments of coming together within a caring occasion provide two individuals with opportunities to decide how to be in the relationship (Watson, 2012). Within transpersonal interactions, the nurse affects and is affected by the other person (Watson, 2012). Core concepts of Watson's theory included the transpersonal caring relationship, authentic presence, and intention of doing for and being with another who is in need (Watson, 2012). Transpersonal human caring moments and connections are complex. Human caring moments consist of consciousness, intentionality, and unique energetic healing presence. Nursing staff implement caring through movements, senses, touch, sounds, and words that they transmit and reflect back to the patient (Watson, 2012).

Multiple nurse researchers agreed with Orlando and Watson on the importance of the patient being involved in a handoff. In the Caring Science Paradigm of Watson, nurse and patient experiences can be detrimentally impacted when authentic caring connections in the present moment are lacking. Sherman, Sand-Jecklin, and Johnson (2013) noted that verbal handoffs at the bedside have many benefits for patient and nurse satisfaction. Having patient handoffs occur at the bedside allowed the nurse to visualize the patient and ask questions of the

patient and previous nurse. The interaction created a patient-centered care moment (Maxson, Derby, Wroblewski, & Foss, 2012).

Organizational systems theory along with patterns of communication provide a foundation for the project as well. Patient handoffs are a significant component of nursing communication in hospitals. Handoffs are intradepartmental and interdepartmental.

Nursing staff comprise a large proportion of the healthcare team within the complexities of a hospital. By nature, nursing teams are relational. According to Kahn, Barton, and Fellows (2013), relationships affected work getting done, coordination between individuals and groups, shared knowledge, and accomplishment of tasks. Relational systems are vital for task coordination, especially when situations are uncertain, interdependent, and time constrained (Gittell, Seidner, & Wimbush, 2010).

Crises are opportunities for growth and positive change with nursing teams. Gittell (2008) found improved resilience among staff with exposure to crisis situations. One such crisis experienced daily by nursing staff is the influx of new patients from other departments in the hospital. From a relational perspective, processes in the system can damage, create disturbance, as well as generate resilience and transformation. However, when relational systems are damaged by crises and not repaired, long-term performance can be at risk (Kahn et al., 2013). Negative patterns of relating were associated with reduced organizational outcomes (Morrison & Milliken, 2000). Trust, communication, mutual respect, and high-quality relationships can facilitate greater coordination and learning in staff (Dutton, Worline, Frost, & Lilius, 2006).

Nursing staff that are assigned to the arrival of a new patient from the PACU potentially experience feelings of being overwhelmed with workload demands of a new admission, unfamiliarity with a new patient, and potential instability inherent to a fresh postoperative

patient. Patient handoff communication must be timely and accurate. Evidence-based literature suggested the ideal form of communication is the face-to-face handoff. Lower quality communication via telephone or written handoff can lead to crisis experienced by the receiving nurse and lower self-efficacy to provide care to the patient from the PACU. Lower quality forms of communication between the PACU and receiving division can create disturbances in the relationship between two departments, leading to animosity and poor patient outcomes.

Purpose and Objectives

A primary focus of this project was to identify the handoff process that created the highest level of self-efficacy (confidence) of the nurse receiving a patient from the PACU. Two types of handoffs were examined. Theoretically, by identifying the best evidence-based practice of providing highest self-efficacy of a receiving nurse, patient care, and nursing satisfaction would be improved. Education to PACU nurses was implemented to determine if application of the five p's during the handoff process enhanced self-efficacy scores of floor nurses receiving a post-operative patient.

One primary goal in the first step of this project was to collect data exploring which form of patient handoff provided higher levels of nursing self-efficacy in the receiving nurse. After initial self-efficacy data was collected, an education offering to PACU nurses on the five p's of handoff was implemented. Nursing self-efficacy scores were then collected again after the education offering to PACU nurses. Analysis of findings in the first and second steps was performed to determine whether the instructional program improved self-efficacy scores in nursing staff.

Project Design

The proposed project included two steps. Within step one, participants consisted of inpatient nursing staff at Barnes-Jewish Hospital that received a patient from the PACU. Staff on nursing divisions selected included a GU and colorectal floor, orthopedics, and ENT floor. Self-efficacy of the receiving nurses all were examined within the context of the two handoff methods. Outcomes of this step included identification of higher self-efficacy scores through one of the two methods of handoff. Self-efficacy scores were assessed utilizing components of the Nursing Competence Self-Efficacy Scale (NCSES) developed by Dr. D. Welsh (2014) at the University of Kentucky (see Appendix E for the NCSES). Nurse participants were offered an opportunity to complete selected questions from the NCSES survey after arrival of patients from the PACU.

Step two of the project consisted of providing PACU nursing staff a brief education offering on the five p's of handoff (patient information, plan of care, purpose, precautions, and problems). Multiple health organizations, including the Association of Operating Room Nurses (AORN) used the five p's as a guide for effective handoffs. Pocket reminder cards with the five-p's mnemonic were provided to staff (see Appendix D for the pocket reference card). After education was provided to the PACU staff, select questions from the NCSES surveys were given a second time to nurses on the selected divisions measuring self-efficacy scores. Statistical analysis was performed comparing results found in the first and second groups of staff.

A cross-sectional methodology was used for this project. Time frames studied were the immediate periods after arrival of post-operative patients to the nursing division. Purposive sampling of patient handoffs was used for data analysis and interpretation via a questionnaire methodology. A measurement tool used for data collection was based upon select questions on

the NCSES. The NCSES is a valid and reliable tool for measuring confidence levels of medical-surgical nurses. Sampling was done until a minimum of 15 handoffs between the PACU and receiving division nurse was reached in each step. Expected outcomes included face-to-face patient handoffs creating higher levels of self-efficacy for receiving nurses. Improvement in nurse self-efficacy scores was expected among staff who received handoff after the PACU education on the five p's of handoff. The nurse investigator projected that if self-efficacy scores improved with the use of the five p's of handoff, implementation of the practice could lead to improved nurse and patient satisfaction.

Data Collected/Reviewed

Participants in the study completed a demographic questionnaire to describe education levels and years employed within a hospital setting. Age categories of the nurse surveyed, nursing division, and type of handoff received were other items collected. For purposes of appropriate measurement in the project, several questions from the original NCSES were omitted. With the creator's permission to modify the NCSES tool, select questions from the NCSES were used to measure nursing perceptions of self-efficacy for engaging in practices after receiving a patient handoff from the PACU (Welsh, 2014). Respondents ranked confidence in their ability to perform nursing care activities based on the handoff report received. A Likert scale between zero (cannot do at all) to ten (certain can do) was used in measurement of self-efficacy levels. Higher scores would indicate greater self-efficacy for the selected skill (Welsh, 2014). Total scores were obtained by adding all the items together for calculation. Higher overall scores indicated greater self-efficacy for nursing practice (Welsh, 2014).

Nursing care activities were subdivided into two sections on the NCSES. The first portion comprised nursing care activities related to complex nursing care. Complex care was

defined as addressing cultural issues, using research findings in practice, providing emotional support for hospitalized patients, etc. A second section was comprised of five questions that addressed fundamental nursing care. Fundamental nursing care was defined as prioritizing care based on patient needs, interpreting patient data from different sources, evaluation of patient response to attention, etc. Participant survey questions are referenced in Appendix K.

Receiving nurses were approached by the principal investigator within the shift of the patient's arrival and offered the opportunity to participate in the study with an informational letter including informed consent via tacit approval (see Appendix F for the informed consent/informational letter). Confidentiality of the nurse was ensured. No personal identifying information such as name was collected. Instances where staff decided to participate, informed consent was implied by their completion of the necessary demographic and selected NCSES questionnaire questions. Answers were submitted by participants via Survey Monkey, an online cloud-based survey development tool. The advantage plan for Survey Monkey was used by the McKendree University principal investigator student. Description of the NCSES instrument is provided in Appendix E.

Expected Outcomes

The principal investigator hypothesized that nurses who received a post-operative patient from the PACU in a face-to-face handoff would demonstrate higher self-efficacy scores on the modified NCSES. An additional hypothesis formulated was nurses who received a written handoff or no handoff at all, would exhibit the lowest self-efficacy scores on the modified NCSES.

Evidence-Based Review of the Literature

Databases accessed during the literature review included the Cumulative Index to Nursing and Allied Health (CINAHL) and Ovid. Time spans for article search were within the years 2010-2017. Reasons for expanding the search beyond five years included difficulty in finding applicable evidence-based articles related to the project. Search terms used for the literature review included patient handoff, patient handover, handoff communication, handoff evaluation tool, PACU, perioperative, Situation, Background, Assessment, and Recommendation (SBAR) tool, self-efficacy, and surgery handoff. A total of 60 articles were reviewed, and from the sample, a total of 32 articles were selected for inclusion in the literature review. Several themes within the literature regarding patient handoff were identified. Substantial portions of research reflected an interest in bedside handoff, handoff checklists, SBAR, and interpersonal dynamics of information exchanged. Previous research addressing the relationship between handoff processes and nursing self-efficacy was not evident.

Method of Handoff Implications

Evans, Grunawalt, McClish, Wood, and Friese (2012), studied impact of shift-to-shift nursing reports at the patient bedside. Nurses were surveyed with Likert scoring regarding satisfaction with bedside report. Despite no sample size being given in the study, findings suggested improved nursing satisfaction with bedside reports and decreased report times. Building on the concept of bedside handoff, Ford and Heyman (2017) examined whether bedside report increased patient perceptions of satisfaction, understanding, participation, and feelings of safety. In their study, a homogenous convenience sample of 81 patients on five different medical-surgical divisions was surveyed with a tool utilizing Likert scoring. Significant correlation was found between "always" receiving bedside handoff and patient satisfaction,

understanding, safety, and participation in care. Ford and Heyman's (2017) findings potentially were altered by the recruitment methods of subjects, and characteristics of the sample may limit generalizability to alternate settings. Ford and Heyman's (2017) small homogeneous sample may not be representative of different populations. Longer length of stays for patients within the sample may have influenced perceptions of handoff processes. Another major limitation was inclusion of only medical-surgical patients. Despite limitations, their study revealed substantial improvement in patient satisfaction with bedside handoffs.

Though a smaller study than Ford and Heyman's (2017) work, Maxson et al. (2012) also studied the effect of bedside handoff on nursing staff and patient safety. Both nurses and patients from a surgical floor were surveyed and data was collected from each group on agreement or disagreement on survey statements related to patient care. Positive correlation was identified with bedside handoff leading to increased patient and nurse satisfaction scores. Despite the diminutive unit size, convenience sampling, and question of whether patients had previously been exposed to bedside handoffs, Maxson et al. (2012) presented evidence that bedside handoff increased satisfaction and safety for patient and nurse.

Advantages and disadvantages of bedside nursing handoff were discussed in Sherman et al. (2013). Researchers performed systematic review of literature related to bedside handoff. A preponderance of sources deduced bedside handoff improved patient outcomes. Patient and nurse satisfaction was noted to be elevated with bedside handoff. However, the literature reviewed only provided anecdotal evidence. Researchers identified that additional quantitative research, particularly with patient outcomes, should be implemented in the future.

Subsequently, Sand-Jecklin and Sherman (2014) examined outcomes with implementation of bedside nursing report format. Nurses and patients within seven medical-

surgical units were surveyed at a large university hospital post-implementation of bedside report. Improvements were noted in unit metrics after implementation of bedside handoff. Nursing staff had increased perceptions of safety and patient fall metrics decreased. Sand-Jecklin and Sherman (2014) provided moderate level of evidence that bedside handoff increased patient and nurse satisfaction scores and improved safety outcomes. One caveat within Sand-Jecklin and Sherman (2014) corresponds with the practice of bedside handoff not being consistently followed. Consequentially, inconsistency of practice illustrates that nursing staff must be involved in the process of implementing any changes to bedside handoff.

Additional studies made inference that patient and nurse satisfaction increased with bedside handoff. In Taylor (2015), a small convenience sample of 17 oncology nurses was surveyed. Implementing bedside handoff improved patient and nurse satisfaction and safety metrics. Caution was warranted due to the small convenience sample and a lack of statistical analysis in the research completed by Taylor (2015).

Holly and Poletick (2014) examined the dynamics of patient handoff within acute care hospitals through their systematic review of 29 qualitative studies. Researchers suggested that the handoff process was a complex social interaction with varying methods to complete the task. Holly and Poletick (2014) suggested consistent guidelines for the handoff process would produce optimal shift reports if followed. In an effort to examine best practices for handoffs, quality and reliability factors, education methods that improved nurse self-efficacy, and information exchange content were explored.

Frankel et al. (2012) studied the concept of what face-to-face handoffs meant in actual practice. Among their research, 52 nursing, medicine, and surgical handovers involving 238 patients were considered. Subjects were videotaped during the handover process, and six

researchers were tasked with identification of verbal, non-verbal, physical themes, and patterns. A consensus building approach was utilized for coding purposes. Four models of non-verbal behavior were identified. A "focus of attention" non-verbal behavior pattern was deemed the best for quality and reliability during handoffs. Researchers felt that attention to non-verbal behavior in conjunction with education and practice would improve the quality and safety of patient handovers (Frankel et al., 2012). Findings demonstrated the importance of non-verbal cues when performing a face-to-face handoff.

Matney, Maddow, and Staggers (2014) studied how knowledge and wisdom were exchanged during medical and surgical patient care handoffs. Ninety-three handoffs were examined, with components on data, information, education, and understanding being identified. Research methodology included direct observation and semi-structured interviews about handoff processes. Data collected revealed that handoff communication begins at the informational level. Levels of knowledge expressed were higher on surgical versus medical floors. Informational phrases were identified in 59% of exchanges, and 41% were knowledge-based. Interestingly, none of the communication exchanges involved the use of wisdom phrases. The research study was conducted within multiple not-for-profit hospitals within one state that had yet to implement care plans within the electronic health record. Thus, findings may not be applicable within other settings. Electronic health records may be used to support an improved handoff. Increased knowledge exchange in handoffs potentially enhance patient experience and outcomes (Matney et al., 2014).

Lee, Mast, Humbert, Bagnardi, and Richards (2016) investigated the influence of implementing teaching interventions to assist nursing students with handoff skills. Initial self-efficacy scores were collected from 40 nursing students on their ability to perform an adequate

handoff. Post-implementation of an education program on handoff processes, self-efficacy scores were collected from students. Findings revealed improved student performance and self-efficacy scores with skill repetition. Potential for bias could exist if the student had previous handoff experience.

Literature revealed researchers endorsed face-to-face handoff. Face-to-face handoffs within the studies enhanced patient, family, and nurse satisfaction. Enhanced patient safety also was found within the research literature.

Handoff Evaluation Tools

Challenges are found within the various types of handoff encountered within the hospital setting. Tools for evaluation have had varying degrees of success with identification of the best practice for handoff. Identification of the impact of handoff method and nursing self-efficacy levels has not been studied.

Development of a reliable measurement tool for handoff evaluation was conducted by O'Connell, Ockerby, and Hawkins (2014). The Handover Evaluation Scale was deemed to be a valid and reliable tool for evaluation of patient handovers. Nearly 300 nurses were surveyed on issues related to quality of information received, interactions, and efficiency during handoff.

Horwitz et al. (2013) studied the feasibility and validity of the Handoff CEX tool for nursing use. Using a nine-point Likert scale, 98 evaluations from 25 nursing handoff reports were examined through a prospective cohort study. The Handoff CEX tool was developed for assessing nursing competency and testing handoff improvements. The instrument has been utilized for identifying gaps within handoff processes. Researchers felt there was no current gold standard of handoff quality. Limitations of this study was inclusion of only nursing and not medical staff. The Handoff CEX was not designed to assess test-retest reliability. Given some

limitations, the Handoff CEX was indicated for measuring and improving quality of handoffs (Horwitz et al., 2012).

Dufault et al. (2010) examined evidence-based protocols for nurse handoff. Research methodology included eight roundtable discussions related to clinical issues encountered during handoff, protocols being practiced, and evidence for practices followed. Research findings implicated that standardized handoffs were essential to patient safety. Improved clinical outcomes resulted from standardized handoffs. Types of protocols recommended included goal-focused reports being rapid and of brief duration. Active verbal communication was desirable with handoffs. Patients were felt to always be included within any handoff. Consistent and organized formats, such as SBAR were recommended.

Use of SBAR for nursing handoff was studied by Cornell, Gervis, Yates, and Vardaman (2014). Fifty-one shift reports and 269 interdisciplinary rounds were used for data collection via random observation. Post-implementation of the SBAR handoff processes revealed consistent and shorter duration of reports. Researchers felt nurse training on SBAR might have been a potential confounder of results. Overall, SBAR provided a focused and consistent handoff format for nurses to utilize (Cornell et al., 2014).

Research was conducted on methods of improving information transfer during patient handoff. Lee, Cumin, Devcich, and Boyd (2015) performed experimental analysis involving 157 nurses. During the study, researchers investigated whether directing attention to written notes or expressing concern over a false statement on patient care improved information transfer. Research methodology included use of questionnaires. Findings lacked evidence to support their hypothesis that expressing concern and directing attention to notes enhanced transfer of information during a bedside handoff.

Rosenbluth, Jacolbia, Milev, and Auerbach (2016) studied average time spans for information to become inaccurate within written handoff sheets. Time frames it took for information to reach a level of inaccuracy was defined as "half-life." At Barnes-Jewish Hospital, handoffs among the PACU staff were done verbally using the written handoff tool as a guide (see Appendix C for the handoff guide). Findings of this study had significant implications related to safety at Barnes-Jewish Hospital. Data was collected on 100 adult inpatients at another academic medical center. Order changes for medications, diet, code level status, and patient location were noted. Findings revealed that the half-life on a 12-hour night shift was six hours for the handoff sheets. Within a 12-hour day shift, half-life of orders was significantly less at 3.3 hours. Patients experienced a change in orders within 24 hours in 92% of cases. Medication-related order changes were found in 90% of cases. Limitations of the study involved only one single facility being used as a sample and the timespan of only 24 hours. Being a pilot study, it included a small sample of patients. Academic medical center settings may skew results as orders typically change more frequently in teaching institutions. Despite limitations of the study, it does pose the high potential for inaccurate information to be present in printed handoff documents for physicians and nurses. Utilization of the electronic health record for a handoff tool may provide solutions to this problem (Rosenbluth et al., 2016). Use of standardized approaches to handoffs were found within the literature. Utilization of a standardized approach at Barnes-Jewish Hospital would promote safety. Avoidance of written handoff tools was endorsed by researchers due to time-limited validity of such report methods.

Technology and Handoffs

Within the synthesis of literature review, several sources described the use of information technology (IT) during patient handoffs. Chapman, Schweickert, Swango-Wilson, Aboul-Enein,

and Heyman (2016) evaluated use of an information technology tool during handoff to improve nurse satisfaction scores via communication. Convenience sampling of 81 nurses on two medical-surgical divisions was performed. Nurses overall were satisfied with the use of an information technology SBAR tool during bedside handoff. Limited generalizability existed within their study due to it being a non-randomized convenience sample. Risk of selection bias also was present. Information technology tools may be useful methods for improving communication.

Staggers and Blaz (2013) examined the use of technology through their systematic review of 30 articles exploring future computerization and handoffs. Verbal handoffs were found to serve a vital function within patient care in their review. Patient-centered perspectives were considered vital in Staggers and Blaz (2013). Handoff methods must be tailored to meet nursing needs. Staggers and Blaz (2013) felt bedside handovers were not supported by evidence because most were poor quality quantitative studies involving small convenience sample sizes. Additional research was necessary according to Staggers and Blaz (2013) due to a need for experimental methodology and improved sampling.

Utilization of electronic health records for handoff processes was found in the literature. Nurse satisfaction in studies improved with use of an electronic form for handoff. Future implementation of Epic for the Barnes-Jewish Hospital electronic health record would create potential improvement in handoff communication.

Perioperative Handoff Processes

McMullan, Parush, and Momtahan (2015) examined current practices for handoff within the PACU. Forty observations with audio recordings were completed at one hospital. Reporting and questions were common verbal behaviors noted. Nursing staff were proactive in asking

questions and gathering information. Findings were felt to be limited in generalizability, as the study only examined one unit and repeat observations were made of several staff. Overall, positive and constructive patterns of communication were found within their work.

Robinson (2016) completed research to examine best handoff processes for perioperative nurses. Handoff observations were made of 50 handoffs utilizing an audit tool. Well-structured standardized handoffs provided evidence of improved transfer of information and increased compliance with regulatory standards. Evidence pointed to reduction in adverse events, through the use of a standardized process reducing communication failures.

Evidence-based research implied that department specific checklists reduced errors during patient handoff. Bruno and Guimond (2016) researched handoff processes involving a checklist specific to the PACU. Convenience sampling was done with 40 patient handovers between the anesthesia team and PACU nurses. Improved transmission of information through the use of a handoff checklist was identified. Sample size was small however and limited to the PACU setting. Findings suggested that lists potentially reduced errors during handoff. However, research exploring PACU to floor nurse handoffs was non-existent.

Rose and Newman (2016) studied vital factors affecting safety during the process of postoperative handovers. Systematic review of 23 articles was performed using the socioecological model to review uncovered complexities of transfers in the postoperative setting. Findings revealed acuity and different types of PACUs influence handovers. None of the articles chosen for inclusion involved randomized controlled trials. Despite limitations, optimal handover communication was vital in the postoperative setting. Feasible information transfer practices were proposed within this context (Rose & Newman, 2016).

Segall et al. (2012) detailed a systematic review encompassing 31 articles naming process and communication recommendations for operating room to PACU/ICU handoffs. Though findings were not generalizable based on the population and design of the study, poor teamwork, and communication during handoff was identified. Nurse inattention was present due to multitasking at the time of patient handoff. Positive correlation was found between poor handoffs and adverse events in this review.

Perioperative studies on handoff processes revealed the importance of bedside reports. However, challenges with bedside handoffs were encountered. Lack of research on the PACU to floor handoff processes was not found in the literature, demonstrating the need for additional research in this area.

Handoff Failure and Process Improvements

Handoff failures during intra-hospital transfers were studied by Ong, BiomedE, and Coiera (2011). Researchers performed a systematic review of literature with 24 articles selected for inclusion. Findings revealed substantial deficits in handoff communication during intra-hospital transfers. Substandard communication during handoffs created a point of vulnerability for the patient. Ong et al. (2011) referenced a lack of evidence on best handoff processes within the hospital. Limited evidence was noted within literature regarding intra-hospital transfers. Overreliance on participant's perceptions of handoff quality was observed in many studies. Overall, there was an overarching need for improved communication for intra-hospital transfers. Significantly, three methods of patient handoff existed between the PACU and surgical divisions at Barnes-Jewish Hospital. Varying methods of patient handoff offered different levels of information and reliability. Based on the literature review findings, researchers have not explored the relationship of handoff types and effect on nursing self-efficacy levels.

Mardis et al. (2017) stated that handoff communication errors were linked to adverse patient events based on a systematic review of 21 articles. Research revealed the impact of handoff interventions on improving patient outcomes. Results were mixed in Mardis et al. (2017), as some findings of studies revealed reduction in patient falls, reportable events, length of stays, and mortality. Limitations within the review included search strategy used and risk of publication bias in the articles examined. Absence of sufficient research to establish best practices for improving patient outcomes related to handoff quality existed. Lack of data linking specific interventions to patient outcomes was present in the literature (Mardis et al., 2017).

Systematic review of the literature regarding quality improvement studies and nursing handovers was described in Halm (2013). Six studies were reviewed that included written, face-to-face, structured tools, and electronic handoffs. Overall themes were interdepartmental handoffs had a positive impact on many processes and outcomes. Inconsistent findings have been found within the studies. Halm (2013) felt additional research was merited to explore which type of handoff was the most effective.

One robust study by Richter, McAlearney, and Pennell (2016) examined management and clinical staff perceptions of handoffs. A large convenience sample of 515,637 respondents from 1,052 hospitals lends to potential generalizability. Subjects were provided the five-point Likert scale Hospital Survey on Patient Safety Culture. Survey questions were focused on perceptions about organizational factors that influenced patient safety and predictors of successful handoffs. Richter et al. (2016) found that perceptions of teamwork and support for safety were significant predictors of successful handoffs. Continuous improvement was identified as being critical to management, but not clinical staff. A culture of openness was substantial for both management and clinical staff. Though results were based solely on perceptions, findings supported

teamwork, improved communication, and sufficient staffing as being vital for successful patient handoffs. Support of safety culture was essential for managers to endorse (Richter et al., 2016).

Natafgi et al. (2016) examined the implementation of a new process for shift-change bedside handoff at eight critical access hospitals with the use of Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS). Findings suggested that the use of TeamSTEPPS and direct involvement of the nursing staff assisted in facilitating the new format of bedside handoff. Results might not be replicated within larger, urban hospital settings.

Small et al. (2016) studied the impact of using Kotter's Change Model on implementation of a bedside handoff process on a medical-surgical division. Nurse and patient satisfaction scores were collected via a survey with Likert scoring. Change models, such as found with Kotter's Model, are crucial to any significant practice change. Small et al. (2016) deemed Kotter's Change Model highly useful in providing a framework for changing practice. Significant limitations of the study included an isolated medical-surgical division participating in data collection. Further research was deemed necessary to determine whether findings would apply in alternate settings. Despite limitations, institutions wanting to conduct bedside handoffs should consider outlining a written bedside handoff process (Small et al., 2016).

Nurse researchers have studied the use of structured bedside handoff tools in facilitating a more caring-focused handoff. Herbst, Friesen, and Speroni (2013) studied a total of 3,161 inpatient nurses using the Introduction, Story, History, Assessment, Plan, Error Prevention, Dialogue (ISHAPED) handoff tool. Patient focus groups were involved in this study. Key findings of this research included patients wanting to be included in all aspects of their care, including handoffs. Major limitations of the study included absence of patient or nurse

satisfaction scores in the data analysis. Utilization of a bedside report process could potentially influence patient and nurse satisfaction (Herbst, Friesen, & Speroni, 2013).

Research demonstrated vital functions that handoffs provided for enhancement of patient safety. Intradepartmental handoff processes that were structured were found to be more efficacious in promoting safety, and enhanced patient, family, and nurse satisfaction.

Nursing Self-Efficacy

Medical errors found in the hospital setting are a result of system failures. Nursing staff serve a vital role in maintaining patient safety from a systems and human factors perspective (Henneman, 2017). Nursing staff serve a vital purpose in identifying, interrupting, and correcting errors in the hospital. Nursing self-efficacy to perform these roles is related to knowing the patient, plan of care, double checking, and close surveillance of the patient (Henneman, 2017). Nursing staff correct errors by their physical presence, reviewing and confirming the plan of care, in conjunction with another nurse.

At Barnes-Jewish Hospital, a culture of safety is present. Open communication, interdisciplinary collaboration, and patient/family involvement are encouraged. However, among the methods of handoff that were currently employed in the PACU setting, use of the written handoff tool did not contribute to safety. Handoff methods may have an impact on nursing self-efficacy of nurses receiving patients on a surgical division.

Implementation of the project studied self-efficacy of nursing staff during the PACU to nursing division handoff process. Selection of a suitable tool for measurement of confidence levels was vital. An appropriate measurement tool was found in Welsh (2014). Welsh's instrument was piloted using a sample size of 150 medical-surgical nurses. The NCSES was designed to measure confidence levels of nurses in providing fundamental and complex care to

patients. The survey consisted of 16 items measuring nursing care processes and confidence levels utilizing a 10-point Likert Scale. Welsh (2014) found the tool to have excellent reliability and validity in identifying areas for nursing practice improvement. For this project, specific questions from the NCSES were used based upon complex and fundamental nursing care activities.

Identification of a valid and reliable measurement instrument for nurse self-efficacy was found in the literature. The NCSES was identified as the optimal tool to accomplish the purposes of the project. Identification of factors that promoted nurse satisfaction were found to be related to self-efficacy.

Summary of Literature

Thirty-two articles were reviewed and included within the literature review for this project. Themes encountered within the literature included topics on bedside handoff, dynamics, education interventions, handoff checklists, information technology tools, surgery handoffs, and the use of SBAR. Limited research was found related to intra-hospital transfers. Evidence-based articles investigating self-efficacy of nurses who receive patients from the PACU via patient handoff were not found. A reliable and valid tool for measuring nursing self-efficacy was identified and used for this project. Factors related to nursing self-efficacy were identified to include perceptions of safety, communication, and satisfaction with type of handoff received. Components of these three factors were inherent in the NCSES as the chosen measurement tool.

Chapter Two - Implementation

Project process and components are discussed in this section. Methods of participant identification, organizational approval, and the instrument for data collection are reviewed.

Process and Components

Study Setting

Implementation of this project took place at Barnes-Jewish Hospital at the South Campus. As previously described in Chapter One, Barnes-Jewish Hospital is an academic health center, serving a wide diversity of patients from around the United States and internationally. The medical center is affiliated with Washington University School of Medicine in St. Louis, Missouri.

Nursing staff from post-anesthesia care areas on the South campus were included in this project. Wide varieties of post-operative patients were seen within the PACU modules. Post-operative recoveries performed within these two modules averaged around 100 daily. Nursing staff from the orthopedic divisions of 7300/7400, colorectal division of 17400, and ENT division of 6200 and 6200 observation unit participated in this project. Having attained Magnet status, the breakdown of education achievement for clinical registered nurses at Barnes-Jewish Hospital is 17% ADN, 7% Diploma, 73% BSN, and 3% MSN, according to the Center for Practice Excellence. Approval from each nursing manager of these divisions was sought and received before implementation of this project.

Participants

An estimated 30 adult participants were recruited for this project. Patients did not participate in this study. No identifiable protected health information was collected or stored for this project. Inclusion criteria for participants included registered nurses currently employed at

Barnes-Jewish Hospital on the South Campus on divisions 7300/7400, 17400, and 6200 and 6200 observation unit. Inclusion criteria for PACU nurses required having a patient going to either 7300/7400, 17400, or 6200/6200 OU.

Step one included a minimum of 15 RN's being surveyed on divisions 7300/7400, 17400, or 6200/6200 OU. Random selection of nurses was based upon patients assigned to go to these nursing divisions after their PACU recovery time. Twenty-five nurses in the PACU were provided instruction on the five p's of patient handoff between steps one and two. However, compliance of PACU staff using the five p's was not monitored. Afterwards, the minimum of 15 floor nurses were offered the opportunity to participate in step two. Nurses were randomly selected after they received a patient from the PACU on their divisions. An informational letter (see Appendix F for the informational letter/informed consent) was provided to floor nursing staff.

Process of Data Collection

Data collection began in September 2017 and concluded the first week of January 2018. The project utilized a cross-sectional methodology. Timeframes studied included the period after the post-operative patient had arrived on the medical-surgical division from the PACU. Random sampling of nurses receiving patient handoffs was collected for data analysis and interpretation via a questionnaire methodology through Survey Monkey.

Potential participants on selected divisions were approached in step one after they had received a handoff from the PACU. Step one data collection occurred over a six-week time span. The principal investigator travelled to the respective division, located the receiving nurse, and offered them an opportunity to participate by providing an informational consent letter (see Appendix F for the informational letter/informed consent). A link to the online modified NCSES

survey was provided. When the investigator was unable to travel to the respective division, informational letters were sent to the nursing division attached to the front of the patient chart.

With step one surveys completed, a minimum of 25 PACU nurses were given a brief education offering on the five p's of patient handoff and provided a pocket card for future reference (see Appendix D with pocket reference card). The education component took place over approximately three weeks.

Step two participants were offered the same survey on the division post-education of PACU staff over an additional six weeks. Nurses were offered the identical modified NCSES survey given in step one. For nurses in step one and step two who agreed to participate, surveys were self-explanatory and could be quickly filled out with minimal direction via Survey Monkey online.

Staff nurse consent letters (see Appendix F for the informational letter/informed consent) were provided to each potential participant by the investigator. Participant demographic questions were answered prior to completion of the survey. Nurses given a consent letter had an option not to complete the survey. Voluntary participation was ensured with no compensation for completion of a survey. Survey completion indicated consent on behalf of the nurse. Surveys took approximately two minutes for completion, preventing significant interference with patient care.

Survey Instrument

Confidence levels related to providing nursing care within the fundamental and complex nursing care domain were collected via the NCSES questions incorporated in the survey. Ability to perform technical skills, prioritize and implement interventions, interpret patient data, and to evaluate care were found within the fundamental nursing care domain. Categories assessed

within the complex nursing care domain included collaboration and pain management. A receiving nurse's ability to provide care to the received patient was evaluated through the survey. Likert scoring using a scale of zero (I cannot do at all) to ten (Certain that I can do) was collected in each chosen category (see Appendix E that details the NCSES).

Additional demographic information was collected from participants. Education background of the nurse, years employed in a hospital setting, type of patient handoff received, and nursing division where patient arrived were collected. No identifiable information was collected from this survey due to the general demographics related to the registered nurse. Potential benefits to society regarding knowledge gained from this project included identification of best methods of patient handoff creating the highest level of safety for patients and nursing staff. Perception of safety, usefulness, and staff satisfaction were included with the survey.

Data collection occurred during the day and night shift, primarily Monday through Friday. The principal investigator only approached the floor nurse in steps one and two after the handoff had occurred. Potential for bias was minimal because data was collected via Survey Monkey online with tacit approval.

Organizational Approval

Stakeholders for this project included the director and nursing staff of the PACU at Barnes-Jewish Hospital on the South Campus. Surgical floor nurses could also realize the benefits of findings. Written approval was obtained from the manager of the PACU for implementation of this project (see Appendix G for approval), as well as the managers from 7300/7400, 17400, and 6200/6200 OU. PACU staff and leadership were also informally given information on the project, including the purpose and expected outcomes.

Institutional Review Board (IRB) approval was sought from Washington University. The IRB at Washington University reviews research projects undertaken at the hospital when the principal investigator is conducting research within the context as student or employee at the university. Since the principal investigator planned to implement the project as a doctoral student at McKendree University and not in previously mentioned capacities, IRB approval was waived per Washington University policy. The Barnes-Jewish Hospital Research Protocol Review Committee was provided the project proposal. Several recommendations by the committee delayed implementation of the project. Approval was granted on September 12, 2017 to initiate the project (see Appendix H for project approval).

Instrument Approval

Written approval was obtained in November 2016 to use the NCSES tool developed by Dr. Welsh at the University of Kentucky (see Appendix I for tool permission). Dr. Welsh is an Associate Professor, Assistant Dean of Undergraduate Faculty Affairs, and the BSN Program Director at the Louisville Campus. Dr. Welsh was contacted via email and given details on the purpose of this project and how the NCSES would be utilized.

McKendree University IRB Approval

Approval from the McKendree University IRB Review Board was obtained in June 2017. Amendments to this proposal were made and approved in September 2017 (see Appendix J for IRB approval). There were no known emotional, psychological, financial, legal, social, or physical risks in this study. No vulnerable participants were identified.

Capstone Project Committee

Committee members for the project included Dr. J. Albers, chair of the student capstone project committee at McKendree University, Dr. K. Whittington, and chair of the DNP program at McKendree University, and Dr. G. Davis, director of the PACU at Barnes-Jewish Hospital.

Timeline for Project Completion

The capstone project completion timeline that was followed:

- Chapter 2 submitted: July 14, 2017
- Chapter 2 accepted: July 28, 2017
- IRB approval identified: September 12, 2017
- Data collection: September 2017-January 2018
- Chapter 3 submitted: March 5, 2018
- Chapter 3 accepted: March 9, 2018
- Final paper submitted: April 5, 2018
- Final paper accepted: April 13, 2018
- Oral presentation completed: April 24, 2018

Budget for Project

Costs for the project included photocopying letters of consent. Pocket reference cards for educating PACU staff on the five p's of handoff was included. Total expenditures for this project were estimated to be less than one hundred dollars.

Data Analysis

Data was analyzed through descriptive statistical analysis techniques. Summaries of cumulative self-efficacy scores based upon various categories was used in the process.

Conclusion

Processes and components of the capstone project have been discussed within this chapter. Participants and the survey instrument were described. IRB approval, instrument approval, and organizational approval were detailed, along with the timelines for completion. An estimated budget was also provided.

Chapter Three - Evaluation

Characteristics of Survey Participants

Non-identifiable demographic data was collected during the two survey periods. Data included participant age range, total years employed in a hospital setting, highest level of nursing education attained, nursing division where the handoff was received, and type of handoff used. Each of these characteristics are detailed and discussed within this section. Questions found on the survey are referenced in Appendix K.

Characteristics of Pre-education Survey Participants

Age Range

A majority of nurses surveyed were within the 20 and 30-year age range. In the pre-education group, 52% of the nurses were grouped in this category. Age attributes found are characteristic of large academic medical centers, especially those affiliated with a school of nursing. A majority of participants who were approached worked on the evening/night shift that is often the primary shift available for inexperienced staff. The second largest group of nurses that participated in the initial survey were ages 31-40. The group constituted 24% of the survey participants.

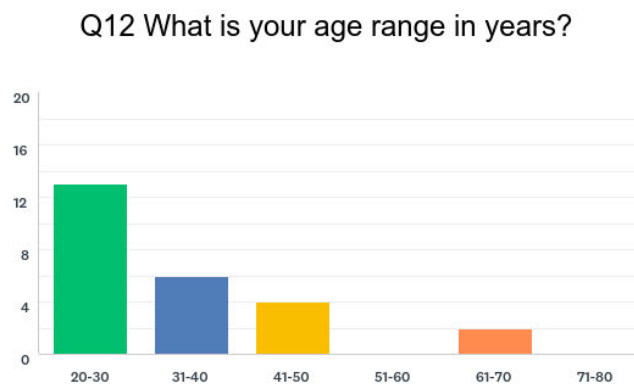


Figure 1. Age ranges of first survey participants at Barnes-Jewish Hospital: $n = 25$.

Years Employed

For the majority of nurses that participated in the pre-education survey, 64% had zero to four years of experience in a hospital setting. Additionally, 20% of the participants were found within the five to ten-year experience range. Findings are characteristic of a large academic medical center where newer, less experienced nurses migrate to immediately after school to obtain experience. Nurses after several years of experience may leave the hospital setting for other opportunities or leave the profession (Mackusick & Minick, 2010).

Q13 How many total years have you been employed in a hospital setting as a Registered Nurse?

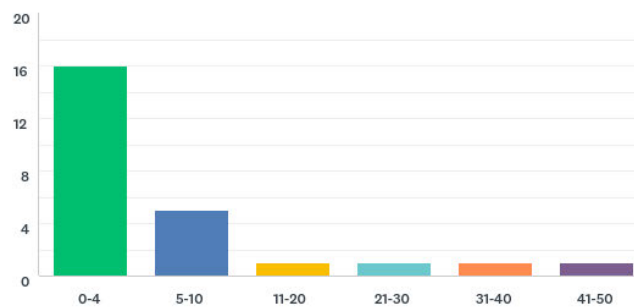


Figure 2. Years of employment with first survey participants at Barnes-Jewish Hospital: $n = 25$.

Level of Education

Substantial amounts of the nurses surveyed were from BSN programs. Barnes-Jewish Hospital designated as a Magnet facility, attracts large proportions of BSN graduates to practice. An isolated diploma graduate was surveyed. Diploma graduates are in the minority. One diploma program remains within the State of Missouri. ADN graduates constituted 16% of survey respondents. Percentages in this sample were characteristic of the data provided by the Center for Practice Excellence at Barnes-Jewish Hospital.

Q14 What is your current highest level of nursing education?

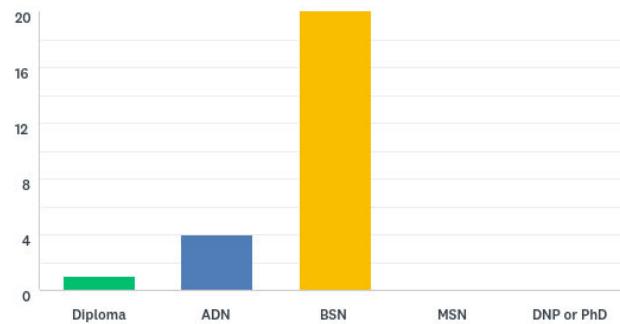


Figure 3. Highest level of education in first survey participants at Barnes-Jewish Hospital: $n = 25$.

Nursing Division

Consistent spread of nursing divisions that participated were found within this first sample. For clarification, division 6200 is an ENT floor. The 6200 Observation Unit is a five-bed unit for ENT cases that require cardiac monitoring and are typically higher acuity. Divisions 7300 and 7400 were both orthopedic divisions. Division 17400 was a busy colorectal floor.

Q15 What nursing division did you receive the handoff on?

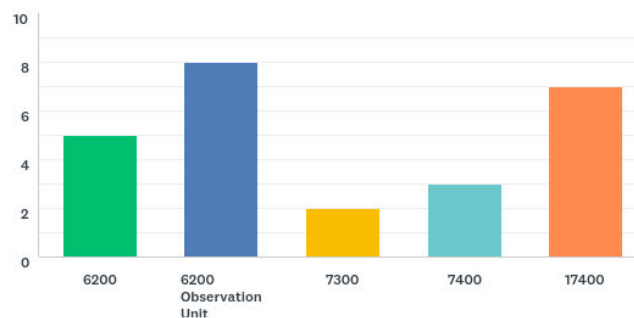


Figure 4. Nursing division of first survey participants at Barnes-Jewish Hospital: $n = 25$.

Type of Handoff Received

Within the pre-education survey group, 80% of the respondents received a telephone report from a PACU nurse. Of the remaining nurses surveyed, 20% received a face-to-face handoff from the PACU. Typically, nurses receiving a face-to-face handoff receive higher

acuity patients, such as those requiring cardiac monitoring, vasoactive infusions, airway issues, etc. Higher acuity and incidence of face-to-face handoff is explained by participants from the 6200 Observation Unit. Therefore, bias from this group of nurses may exist within the data.

Q8 What type of handoff did you receive from the PACU nurse?

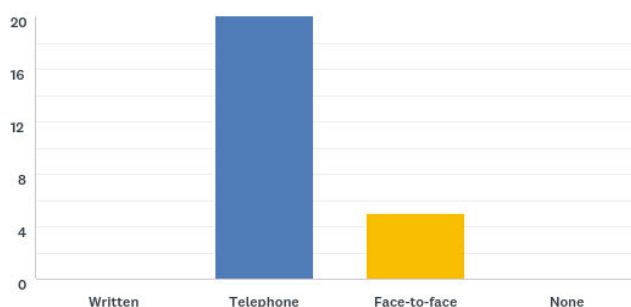


Figure 5. Type of handoff experienced by first survey participants at Barnes-Jewish Hospital: $n = 25$.

Respondents in the pre-education group were asked to rate their perception of safety, usefulness, and overall satisfaction with the handoff they received. Scores were recorded on a zero to ten Likert scale and cumulative averages for each area were calculated as found in table one.

Table 1

Staff Perceptions of Safety, Usefulness, and Overall Satisfaction with Handoff - Pre -Education

Safety of Handoff	Usefulness of Handoff	Satisfaction with Handoff
8.16	7.92	8.24

Note: Cumulative averages for each category shown: $n = 25$.

Although not statistically reliable or valid, comparison of the scores could aid with identification of clinical significance for the type of handoff received.

Characteristics of Post-Education Survey Participants

Age Range

Age range of participants in the post-education group were consistent with those identified in the pre-education group. A majority of the participants were in the 20-30 age range.

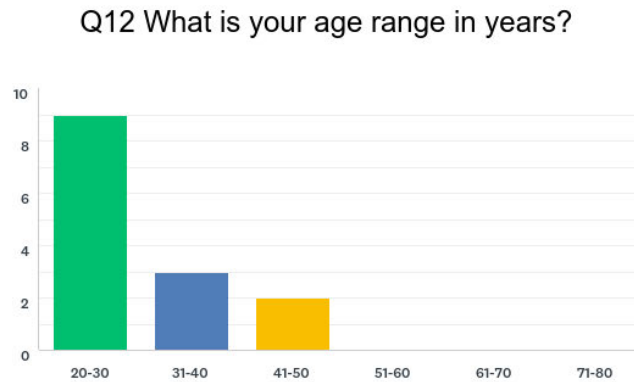


Figure 6. Age ranges of second survey participants at Barnes-Jewish Hospital: $n = 14$.

Years Employed

Years of employment within a hospital setting were consistent in the post-education group compared with the pre-education group. This is attributed to most respondents being newer nurses and working the evening and night shift.

Q13 How many total years have you been employed in a hospital setting as a Registered Nurse?

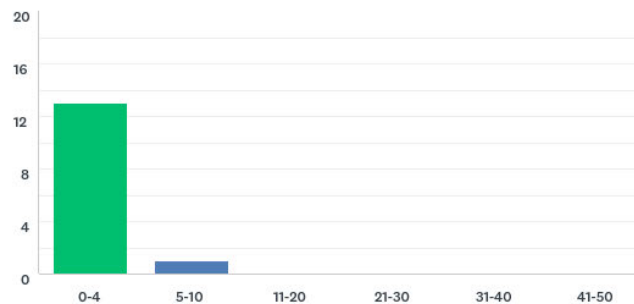


Figure 7. Years employed in second survey participants at Barnes-Jewish Hospital: $n = 14$.

Level of Education

In the post-education group, 100% of the participants ($n=14$) were BSN graduates. The high percentage is attributed to Barnes-Jewish Hospital being a Magnet facility.

Q14 What is your current highest level of nursing education?

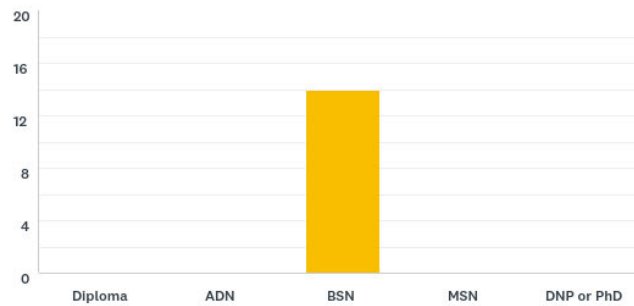


Figure 8. Level of education in second survey participants at Barnes-Jewish Hospital: $n = 14$.

Nursing Division

A majority of participants were from divisions 7300, 7400, and 17400 in the post-education group. One participant was from division 6200, with no participants in the 6200 Observation Unit. Nurses participating in the survey who responded were caring for lower acuity patients within this survey group, since 6200 OU typically admits higher acuity ENT cases. Potential effect on self-efficacy scores within the second group may exist.

Q15 What nursing division did you receive the handoff on?

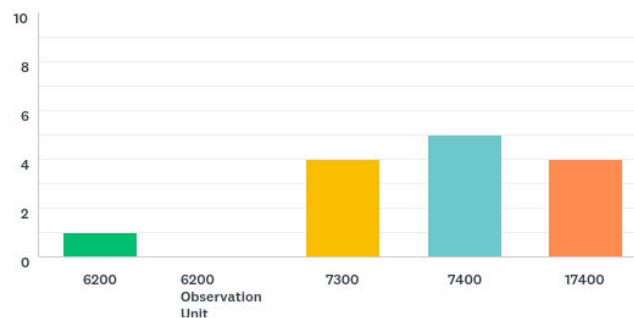


Figure 9. Nursing division of second survey participants at Barnes-Jewish Hospital: $n = 14$.

Type of Handoff Received

Within the post-education group, one respondent received no handoff report. The remainder of the sample received a telephone handoff. A single likely explanation for the absence of face-to-face handoffs with this group was the lack of patients transferred the 6200 OU division. The ENT step-down unit typically receives higher-acuity patients with requirements for cardiac monitoring and close airway monitoring, and thus significantly more face-to-face handoffs between staff. Consequently, lower acuity patients in the sample may have contributed to nurses' increased perceptions of self-efficacy.

Q8 What type of handoff did you receive from the PACU nurse?

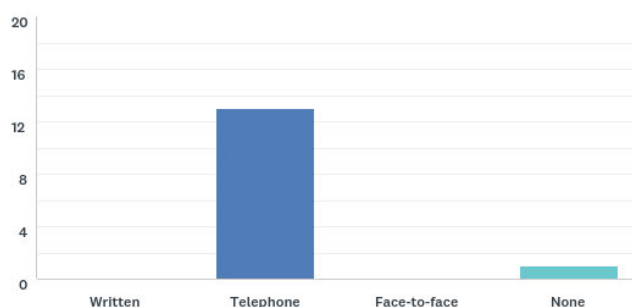


Figure 10. Type of handoff received by second survey participants at Barnes-Jewish Hospital: $n = 14$.

Respondents in the post-education group were asked to rate their perception of safety, usefulness, and overall satisfaction with the handoff they received. Scores were recorded on a zero to ten Likert scale and cumulative averages for each area were calculated. Scores found in this group were lower than that found in the pre-education group. Although not a reliable or valid measurement, a possible explanation for these lower scores may be linked to survey fatigue on the part of participants. An additional explanation was lack of face-to-face handoffs in this group.

Table 2

Staff Perceptions of Safety, Usefulness, and Overall Satisfaction with Handoff - Post -Education

Safety of Handoff	Usefulness of Handoff	Satisfaction with Handoff
7.86	7.79	7.71

Note: Cumulative averages for each category shown: $n = 14$.

Survey Question Analysis

Question One

With the pre-education survey, question one addresses rating the degree of confidence within the nurse to collaborate effectively with the inter-professional team based upon the handoff they received from the PACU. Visual representation of the data and weighted average are found in Figure 11:

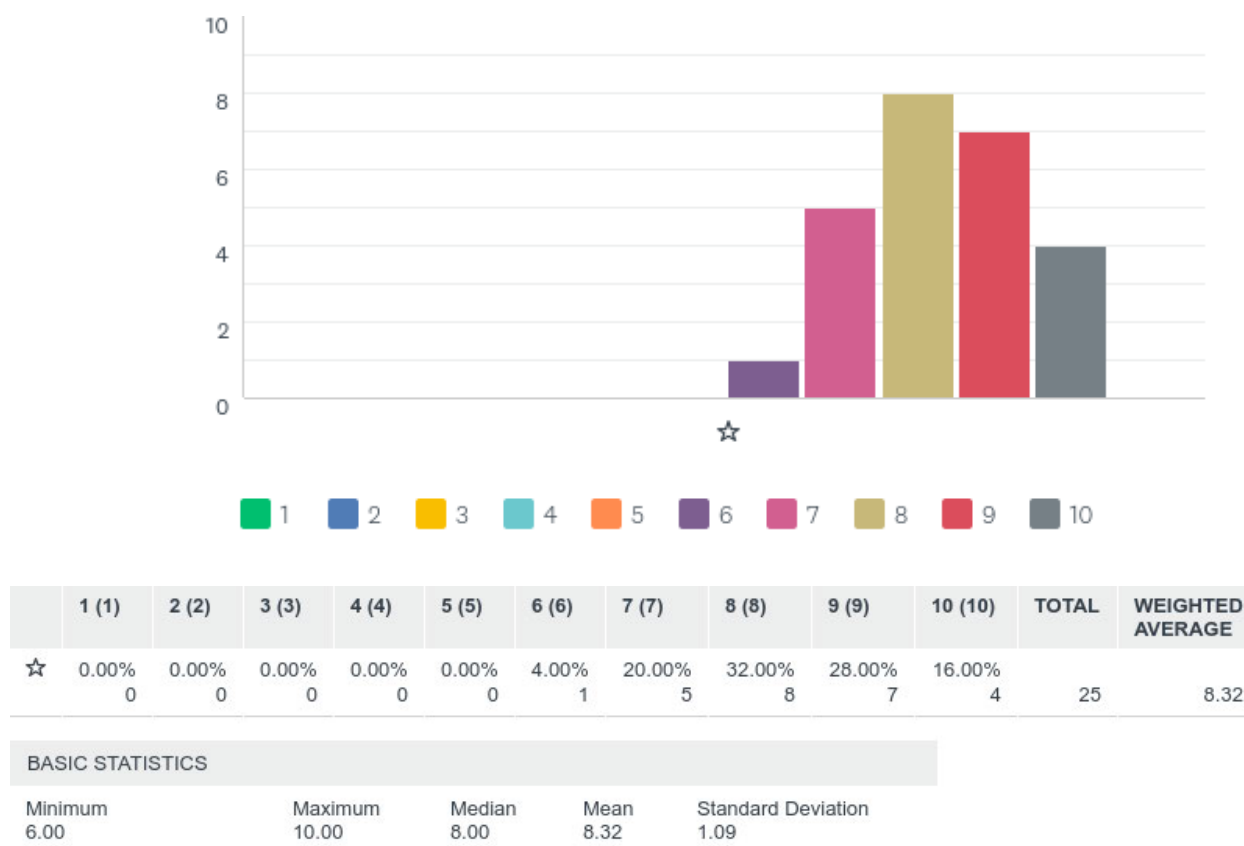


Figure 11. Question one (collaboration) individual self-efficacy score distribution in pre-education group: $n=25$.

For comparative purposes a visual representation of the data and weighted average of responses to question one in the post-education group are found in Figure 12:

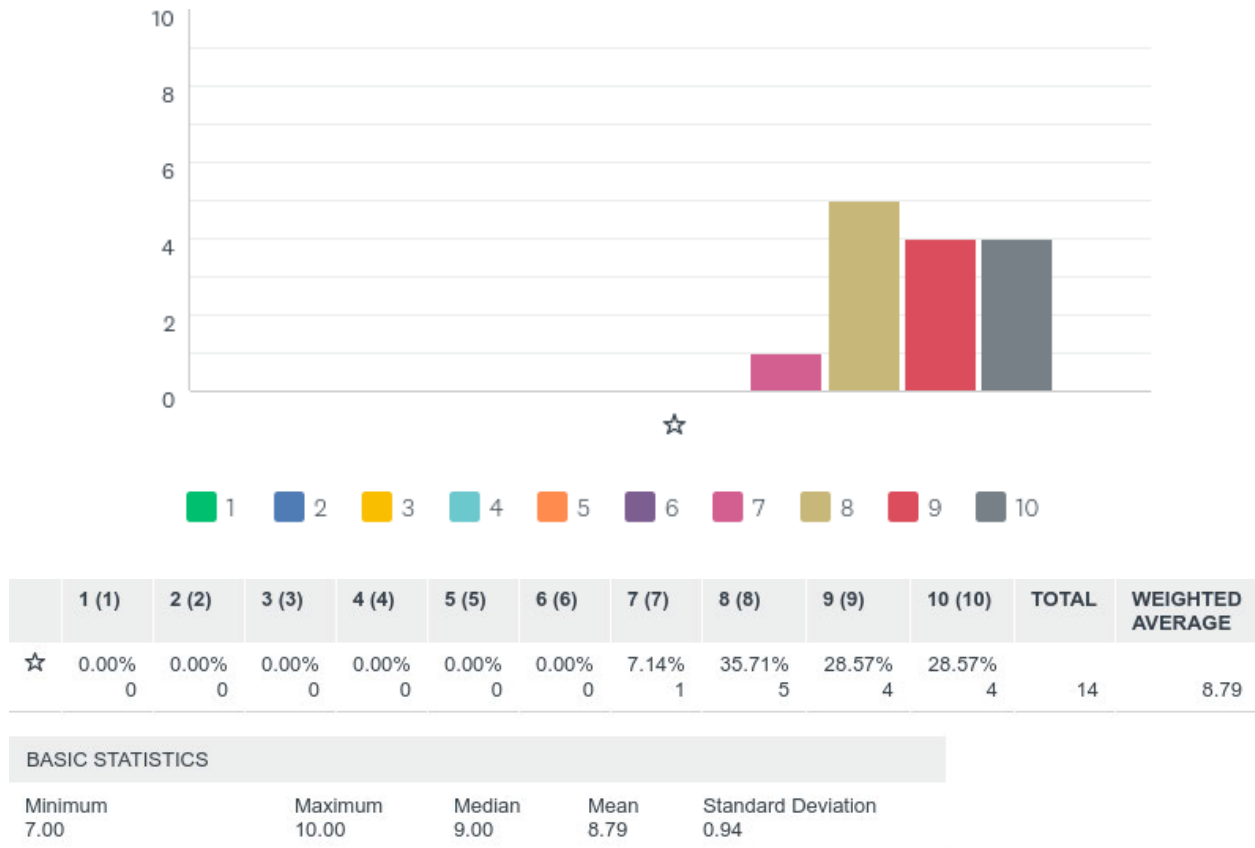


Figure 12. Question one (collaboration) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Two

Question two within the pre-education group addresses the nurse's degree of confidence to minimize patient pain and suffering. Visual representation of the data and weighted average are found in figure 13:

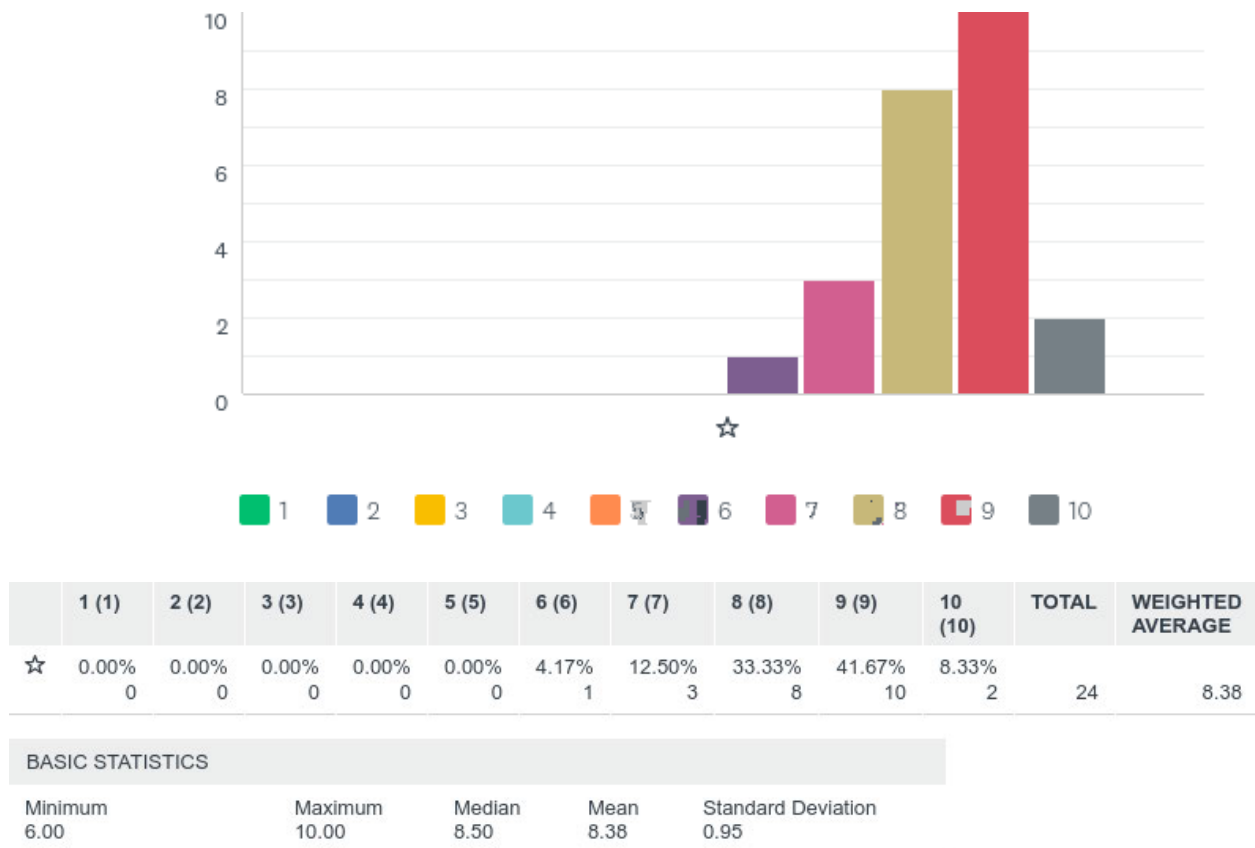


Figure 13. Question two (minimizing pain) individual self-efficacy score distribution in pre-education group: $n = 24$. Note. One respondent skipped this question.

For comparative purposes a visual representation of the data and weighted average of responses to question two in the post-education group are found in Figure 14:

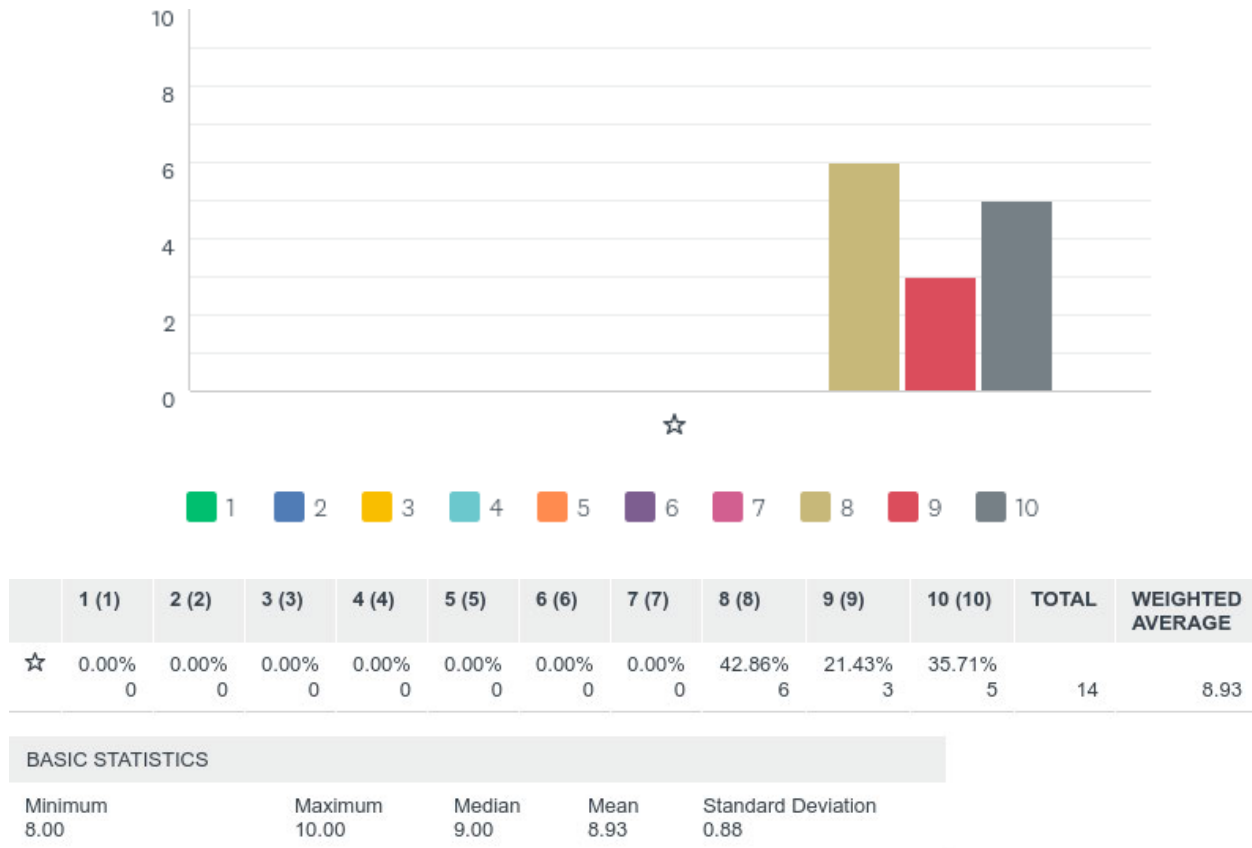


Figure 14. Question two (minimizing pain) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Three

Question three within the survey addresses the nurse's degree of confidence to safely perform technical skills required for patient care. Visual representation of the data and weighted average are found in figure 15:

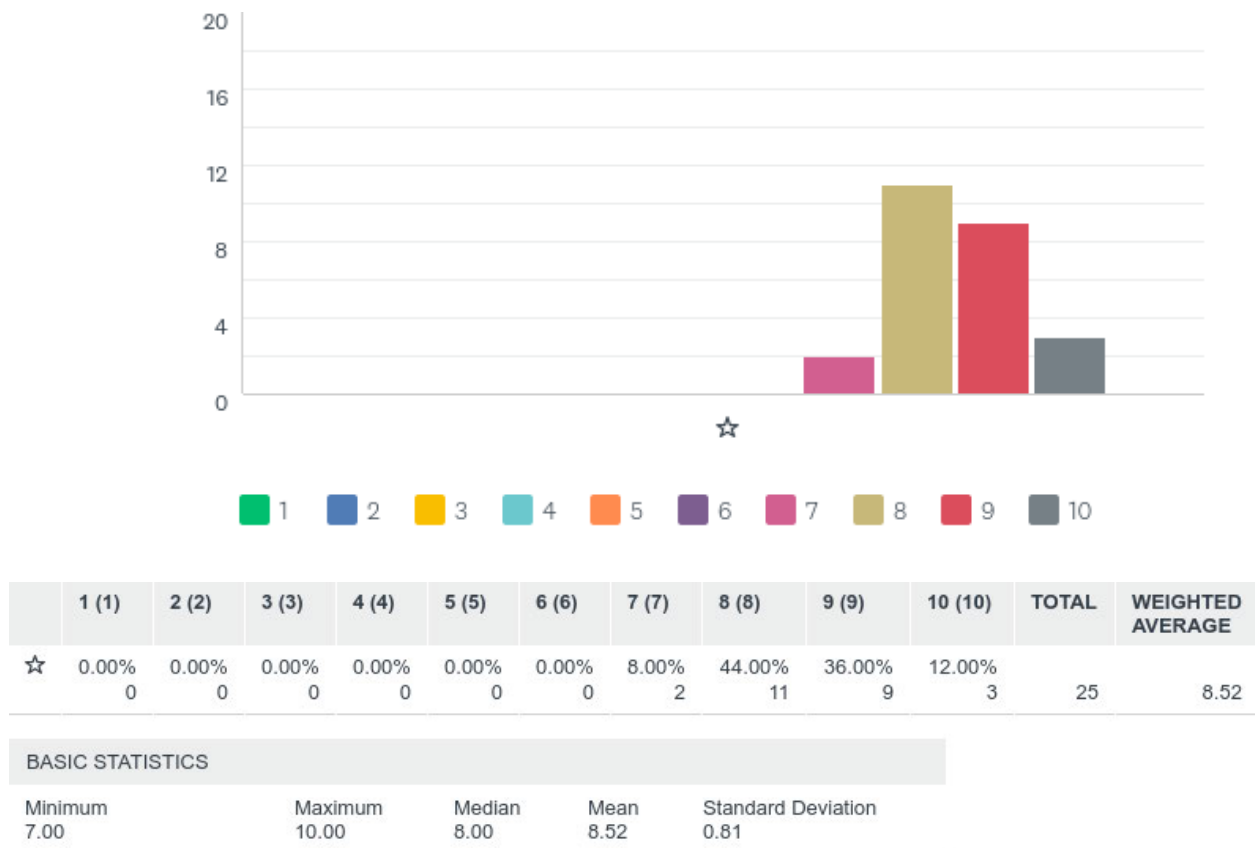


Figure 15. Question three (technical skills) individual self-efficacy score distribution in pre-education group: $n = 25$.

For comparative purposes a visual representation of the data and weighted average of responses to question three in the post-education group are found in Figure 16:

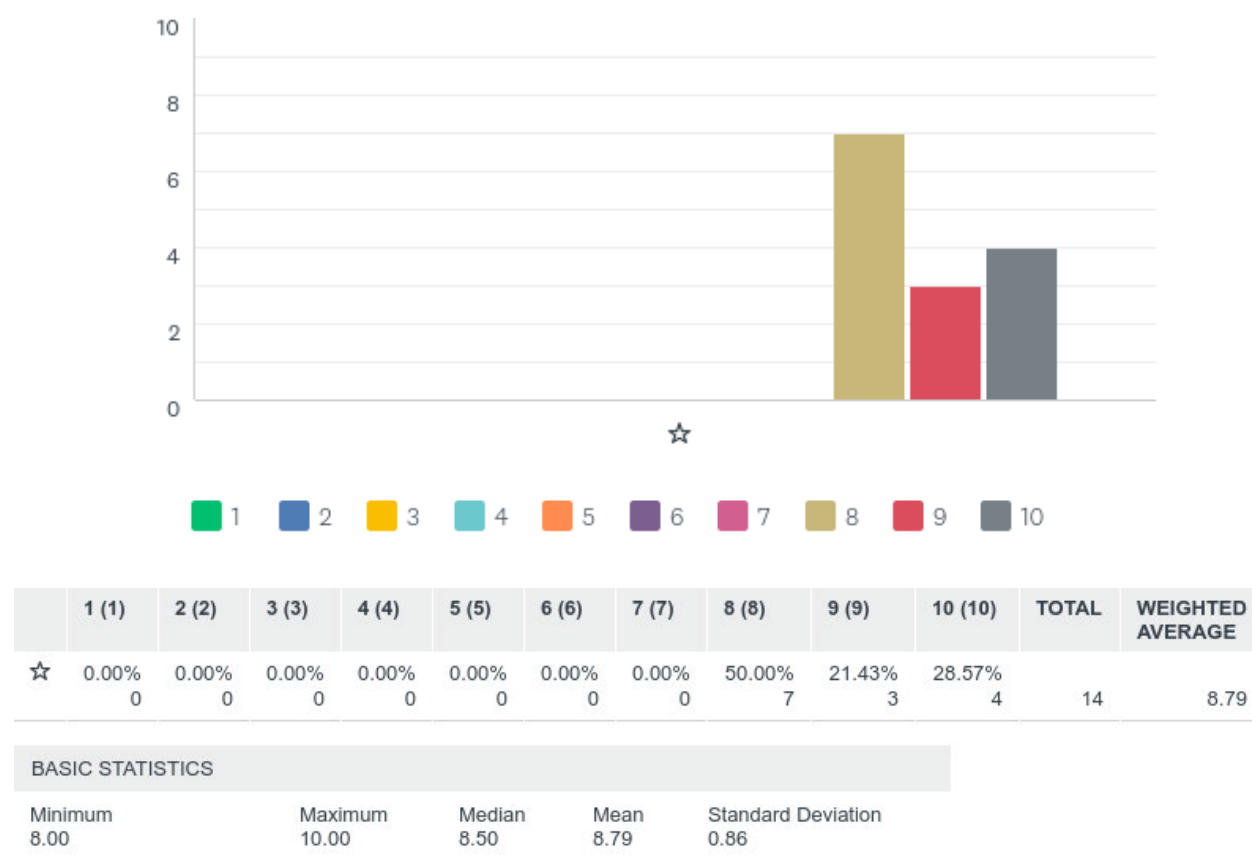


Figure 16. Question three (technical skills) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Four

Question four of the survey addresses the degree of confidence of the nurse to prioritize interventions to address changing patient needs. Visual representation of the data and weighted average are found in figure 17:

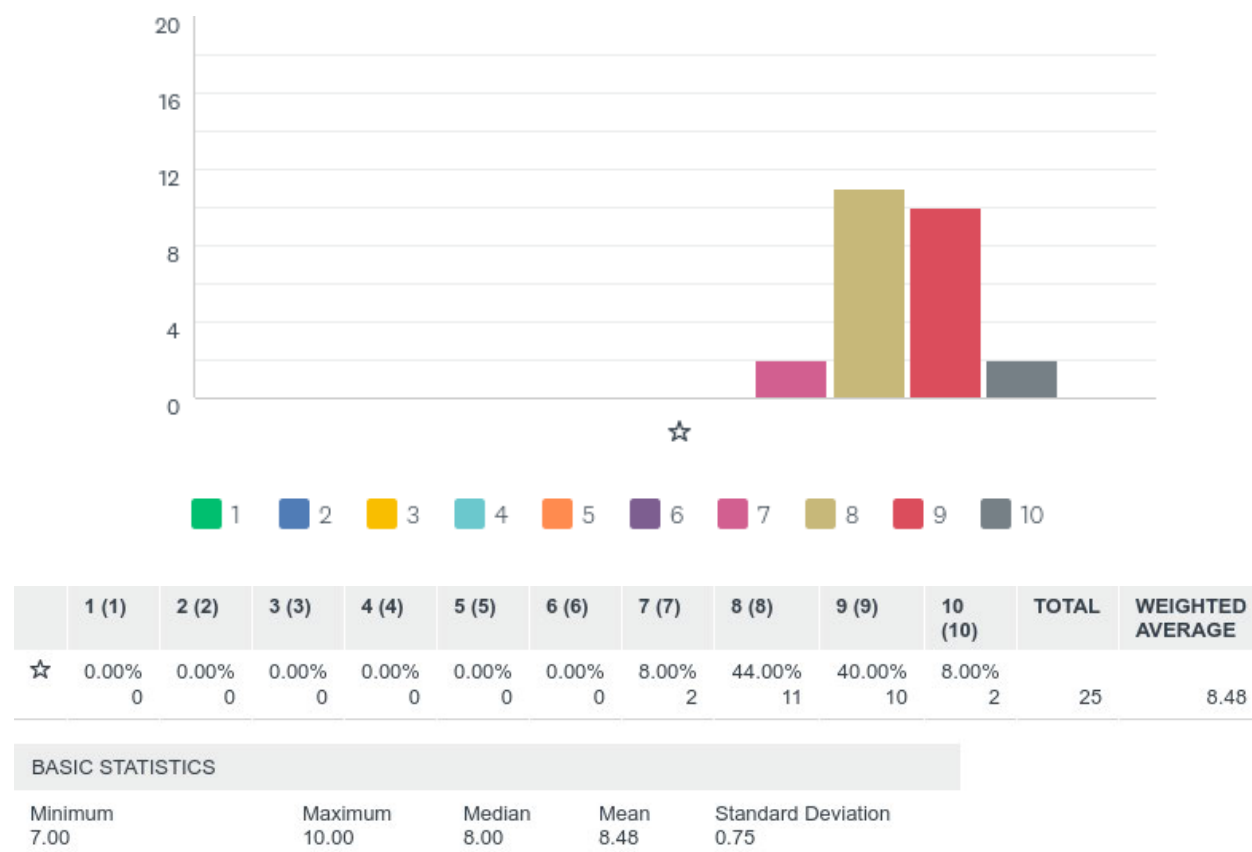


Figure 17. Question four (prioritization of care) individual self-efficacy score distribution in pre-education group: $n = 25$.

For comparative purposes a visual representation of the data and weighted average of responses to question four in the post-education group are found in Figure 18:

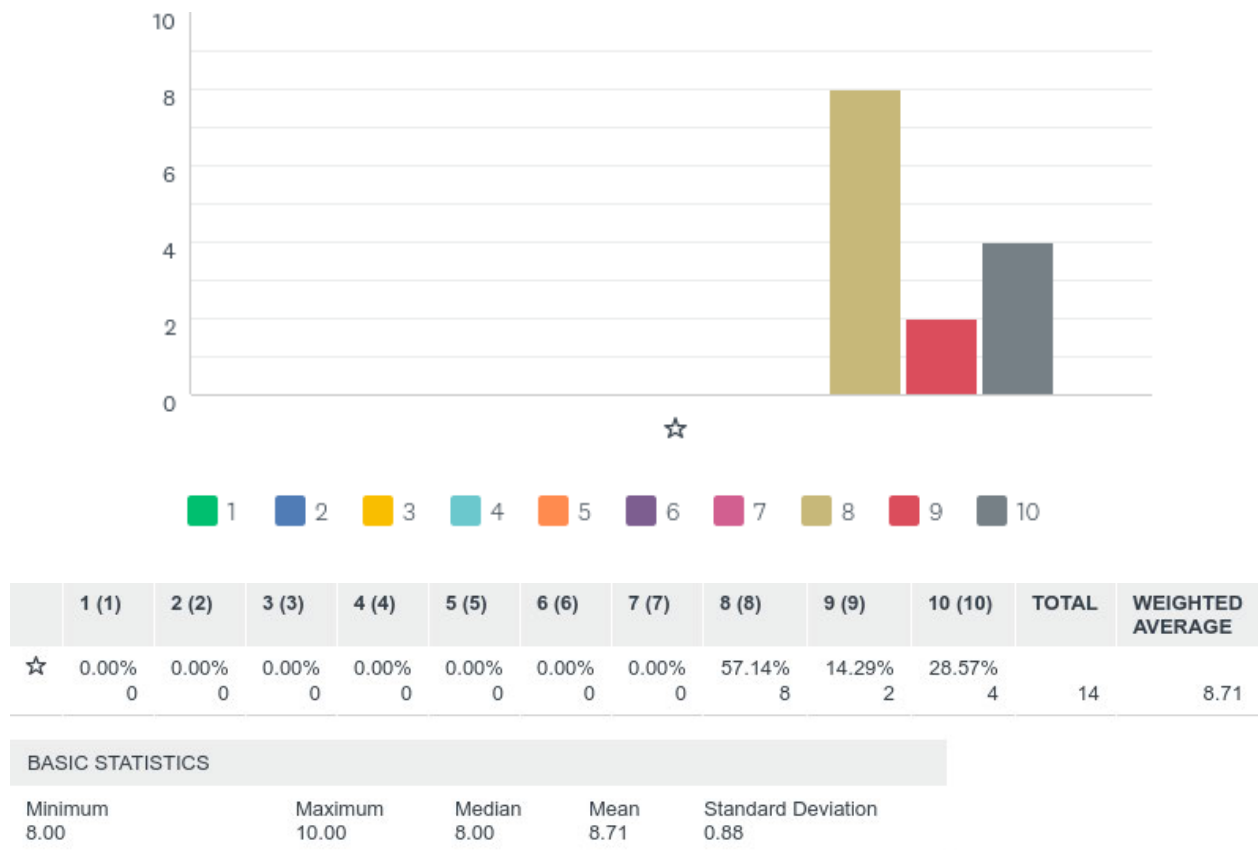


Figure 18. Question four (prioritization of care) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Five

Question five of the survey addresses the nurse confidence levels to implement interventions to effectively treat patient problems. Visual representation of the data and weighted average are found in figure 19:

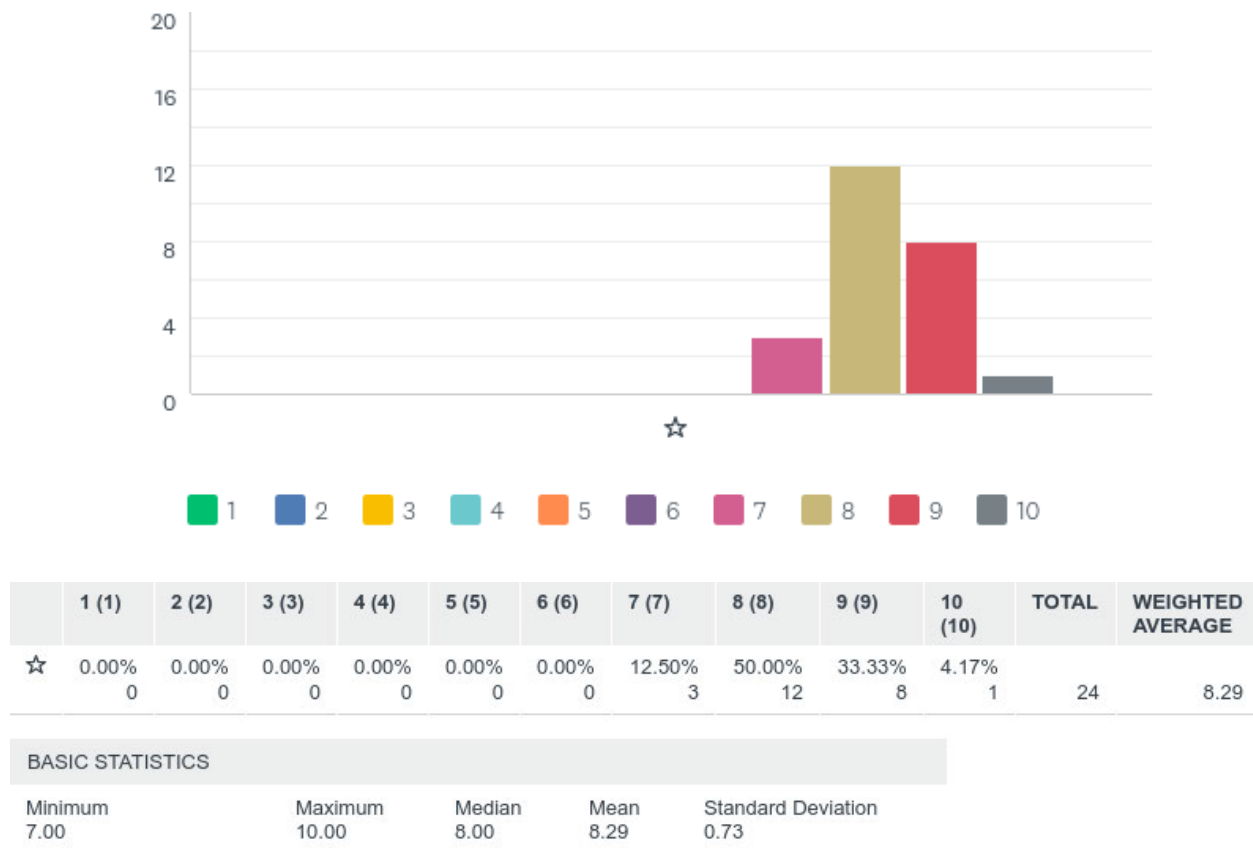


Figure 19. Question five (treating patient problems) individual self-efficacy score distribution in pre-education group: $n = 24$. Note. One respondent skipped this question.

For comparative purposes a visual representation of the data and weighted average of responses to question five in the post-education group are found in Figure 20:

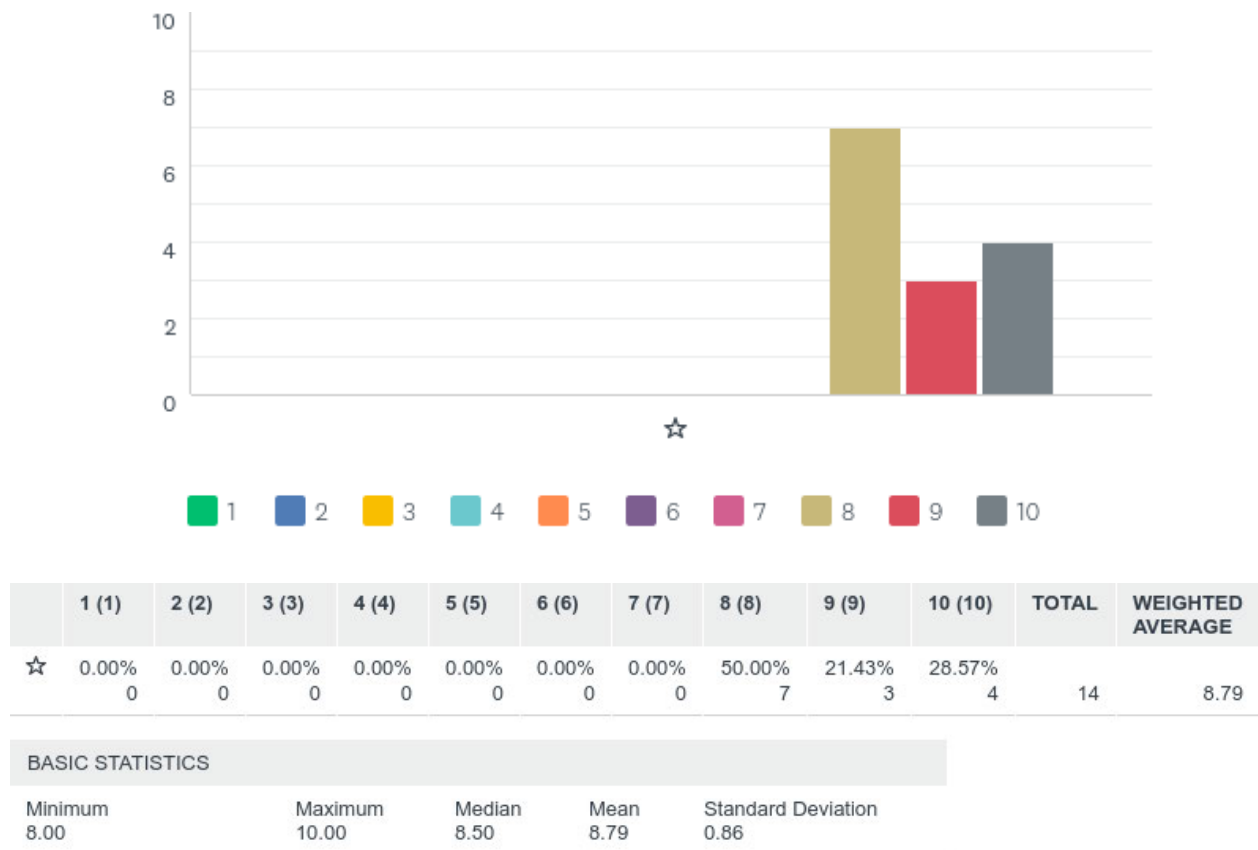


Figure 20. Question five (treating patient problems) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Six

Question six of the survey addresses the degree of confidence within the nurse to interpret patient data from a variety of sources. Visual representation of the data and weighted average are found in figure 21:

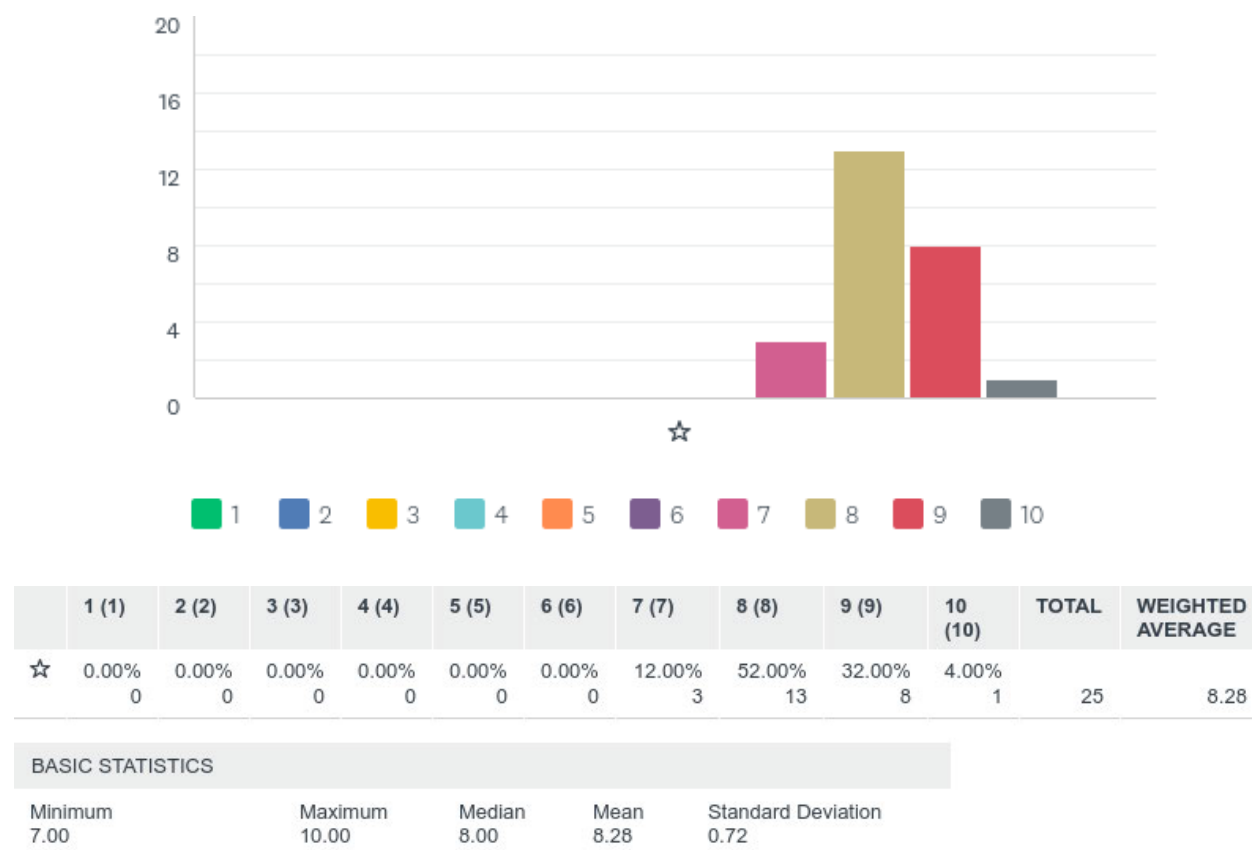


Figure 21. Question six (interpretation of patient data) individual self-efficacy score distribution in pre-education group: $n = 25$.

For comparative purposes a visual representation of the data and weighted average of responses to question six in the post-education group are found in Figure 22:

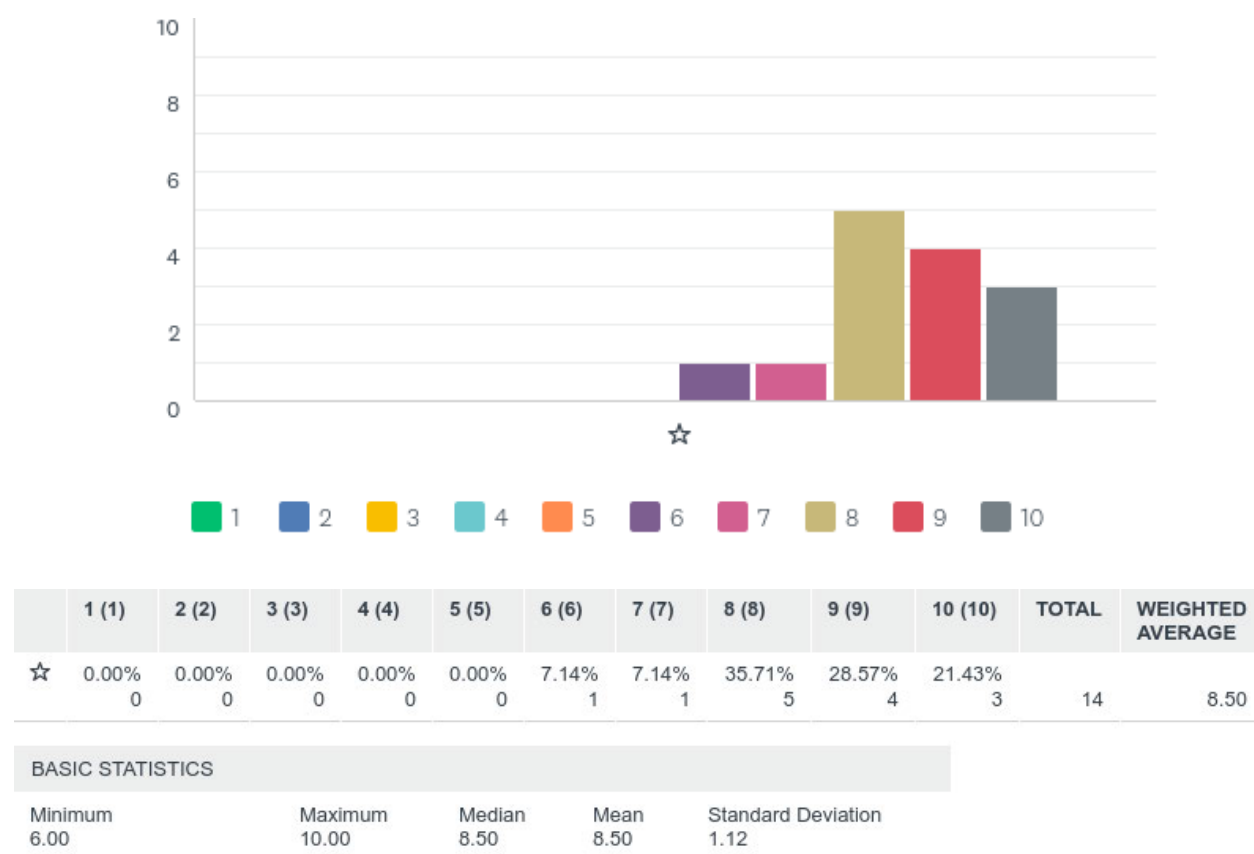


Figure 22. Question six (interpretation of patient data) individual self-efficacy score distribution in post-education group: $n = 14$.

Question Seven

Question seven of the survey addresses the degree of confidence to evaluate patient response to care. Visual representation of the data and weighted average are found in figure 23:

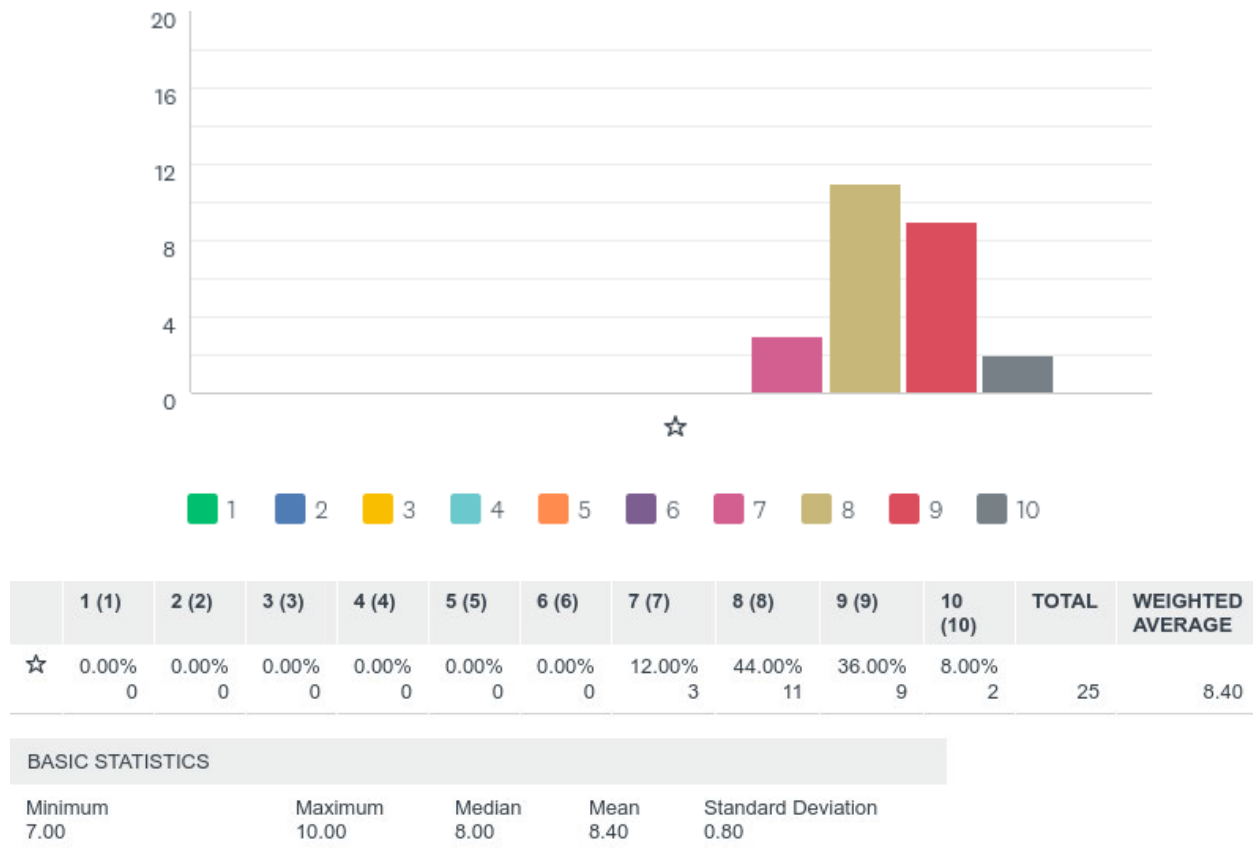


Figure 23. Question seven (evaluation of patient response) individual self-efficacy score distribution in pre-education group: $n = 25$

For comparative purposes a visual representation of the data and weighted average of responses to question seven in the post-education group are found in Figure 24

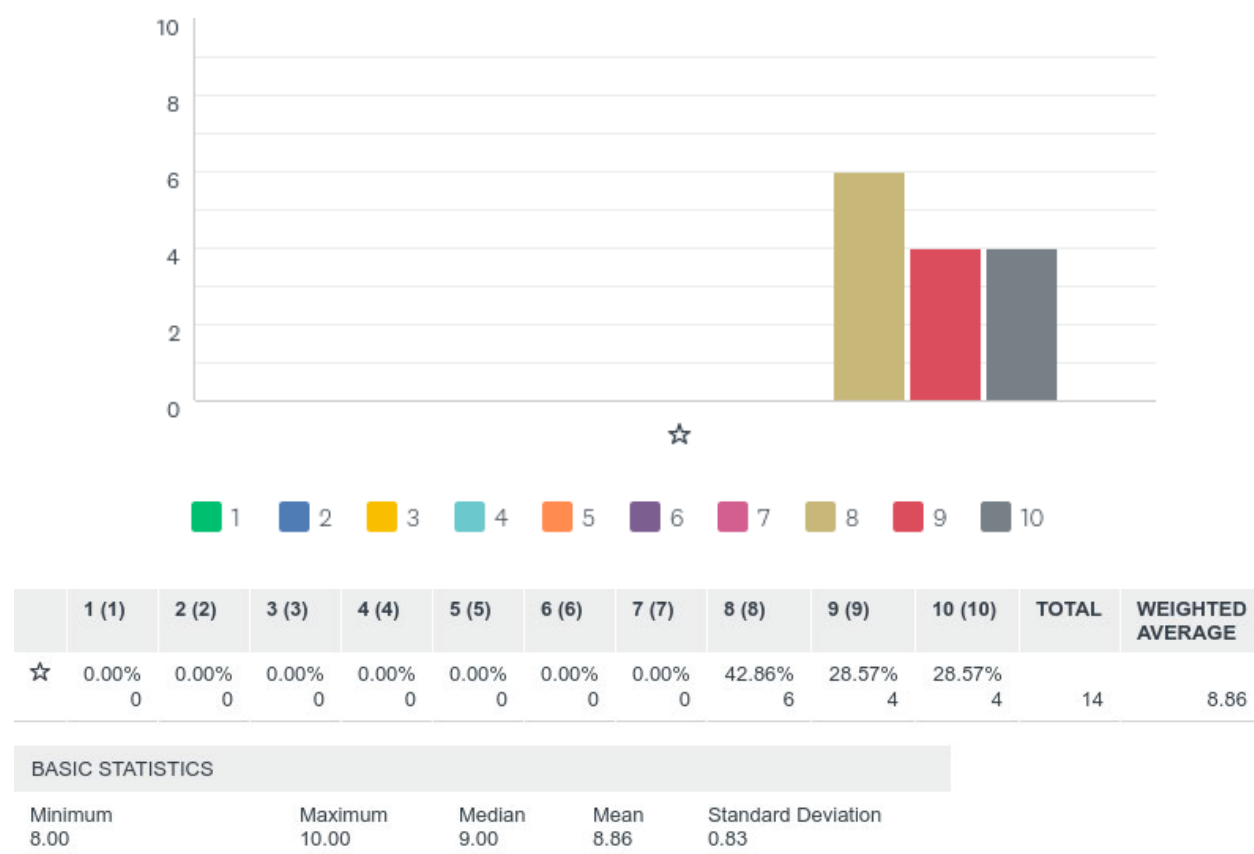


Figure 24. Question seven (evaluation of patient response) individual self-efficacy score distribution in post-education group: $n = 14$.

Cumulative Self-Efficacy Scores

Analysis was completed on a question by question basis in the pre- and post-education group of participants. Cumulative self-efficacy scores for each question were calculated within each. Refer to tables three and four with cumulative self-efficacy scores based upon each survey group.

Pre-Education Group

Analysis for aggregate nursing self-efficacy scores was calculated with $n = 25$. A cumulative self-efficacy score for the pre-education survey group was calculated and findings are summarized in table three:

Table 3

Cumulative Self-Efficacy Scores for Pre-Education Group

<i>Degree of Confidence to:</i>	<i>Cumulative Self-Efficacy Score:</i>
Collaborate effectively with the inter-professional team.	8.36
Intervene to minimize patient pain and suffering.	8.44
Safely perform the technical skills required for patient care.	8.52
Prioritize interventions to address changing patient needs.	8.48
Implement interventions to effectively treat patient problems.	9.00
Interpret patient data from a variety of sources.	8.28
Evaluate patient response to care.	8.40

Note. Pre-education group cumulative self-efficacy scores based on individual questions: $n = 25$.

Post-Education Group

Analysis of each individual nurse self-efficacy score was calculated with $n = 14$. A cumulative self-efficacy score for the post-education survey group was determined and findings are summarized in table four:

Table 4

Cumulative Self-Efficacy Scores for Post-Education Group

<i>Degree of Confidence to:</i>	<i>Cumulative Self-Efficacy Score:</i>
Collaborate effectively with the inter-professional team.	8.78
Intervene to minimize patient pain and suffering.	8.92
Safely perform the technical skills required for patient care.	8.78
Prioritize interventions to address changing patient needs.	8.71
Implement interventions to effectively treat patient problems.	8.78
Interpret patient data from a variety of sources.	8.50
Evaluate patient response to care.	8.85

Note. Post-education group cumulative self-efficacy scores based on individual questions: $n = 14$.

Cumulative self-efficacy scores were noted to be higher in the post-education group compared to the pre-education group. One exception was noted in the case of question five dealing with the ability to effectively treat patient problems. The pre-education group score was higher than the post-education. For a detailed comparison between cumulative self-efficacy scores within each group, refer to table five:

Table 5

Comparison of Cumulative Self-Efficacy Scores in Pre- and Post- Education Groups

<i>Degree of Confidence to:</i>	<i>Pre-Education Cumulative Self-Efficacy Score:</i>	<i>Post-Education Cumulative Self-Efficacy Score:</i>
Collaborate effectively with the inter-professional team.	8.36	8.78
Intervene to minimize patient pain and suffering.	8.44	8.92
Safely perform the technical skills required for patient care.	8.52	8.78
Prioritize interventions to address changing patient needs.	8.48	8.71
Implement interventions to effectively treat patient problems.	9.00	8.78
Interpret patient data from a variety of sources:	8.28	8.50
Evaluate patient response to care.	8.40	8.85

Note. Comparison of cumulative self-efficacy scores pre-education versus post-education offering based on individual questions.

Type of Handoff

Comparisons were made between the cumulative self-efficacy scores in the pre-education group based upon the type of handoff that was received by the division nurse. In this comparison, the face-to-face handoff scores are higher than those seen in the telephone report category. Refer to table six for findings:

Table 6

Comparison of Self-Efficacy Scores between Types of Handoff Received in Pre-Education Group

<i>Type of Handoff Received:</i>	<i>Cumulative Self-Efficacy Score:</i>
Face-to-Face	8.51
Telephone	8.35

Note. Comparison of cumulative self-efficacy scores based on type of handoff received in the pre-education group: $n = 25$.

Caution is warranted when comparing the cumulative self-efficacy scores in the post-education group based upon the type of handoff received. One individual's cumulative self-efficacy score was lower in a situation where no type of handoff was received from the PACU. Due to the small sample size, definitive conclusions cannot be made from this data. Refer to table seven:

Table 7

Comparison of Self-Efficacy Scores between Types of Handoff Received in Post-Education Group

<i>Type of Handoff Received:</i>	<i>Cumulative Self-Efficacy Score</i>
Telephone	8.82
None	8.00

Note. Cumulative self-efficacy scores based on type of handoff received in the post-education group: $n = 14$.

Comparison of self-efficacy scores based upon the type of handoff received in each survey group was made. In the pre-education group, higher self-efficacy scores were found with the face-to-face handoff. Pre-education group participants all reported receiving a handoff. Post-education group participants did not report receiving face-to-face or written handoff. Post-education group self-efficacy scores were higher in the telephone handoff group compared to the isolated case with no handoff being received. Due to the small size of this group, caution is suggested when interpreting the significance of these findings. Telephone self-efficacy scores are higher in the post-education group than the pre-education group. Findings suggest a need for further research.

Also, as discussed earlier, lower acuity patients may have been present in the post-education group. Refer to table eight:

Table 8

Comparison of Self-Efficacy Scores Based on Type of Handoff in Each Group

<i>Type of Handoff Received:</i>	<i>Pre-Education Group n=25</i>	<i>Post-Education Group n=14</i>
Face-to-Face	8.51	No Data Available
Telephone	8.35	8.82
Written	No Data Available	No Data Available
None	No Data Available	8.00

Note. Comparison of cumulative self-efficacy scores based on type of handoff in the groups.

Education

Caution is warranted when comparing the cumulative self-efficacy scores based upon education levels of nursing staff in the pre-education survey group. A single cumulative self-efficacy score was found to be higher with the diploma graduate, despite the majority of respondents having attained the BSN degree. An argument could be made that perhaps diploma educated nurses have been in nursing longer periods of time, leading to increased self-efficacy. However, due to the small sample size, conclusions cannot be made and warrant additional research in the future. Refer to Table nine:

Table 9

Comparison between Self-Efficacy Scores Based on Education Level

<i>Education Level of Nurse:</i>	<i>Cumulative Self-Efficacy Score:</i>
ADN (n = 4)	7.46
BSN (n = 20)	8.50
Diploma (n = 1)	9.71

Note. Comparison of cumulative self-efficacy scores based on education level of nurse in the pre-education group: $n = 25$.

Cumulative self-efficacy scores of the BSN nursing staff in the post-education group were found to be 8.76. Cumulative self-efficacy scores in the pre-education group of BSN nurses were lower than the post-education group. Refer to table ten:

Table 10

Cumulative Self-Efficacy Scores of BSN Nursing Staff in Post-Education Group

<i>Education Level of Nurse:</i>	<i>Cumulative Self-Efficacy Score:</i>
BSN	8.76

Note. Cumulative self-efficacy score based on type of education level in the post-education group: $n = 14$.

Comparison of the cumulative self-efficacy scores based on education levels in the pre- and post- education groups demonstrate higher scores in the isolated diploma nurse, followed by the BSN, and finally the ADN nursing staff. Further research on the relation between education levels and self-efficacy scores is suggested. For comparison refer to table 11:

Table 11

Comparison of Cumulative Self-Efficacy Scores According to Education in Pre- and Post-Education Groups

<i>Pre-Education Self-Efficacy Scores</i>	<i>Post-Education Self-Efficacy Scores</i>
ADN = 7.46 (n = 4)	ADN = No Data
BSN = 8.50 (n = 20)	BSN = 8.76 (n = 14)
Diploma = 9.71 (n = 1)	Diploma = No Data

Evaluation of Outcomes

Two objectives for this project were formulated. A primary objective was to identify if the type of handoff impacted self-efficacy of a floor nurse receiving a patient from the PACU. A secondary objective was to determine if implementation of an education offering to PACU nurses on the five p's of handoff enhanced self-efficacy scores of floor nurses receiving a post-operative patient. Evaluation of achievement of these objectives was in congruence with evidence-based research findings and descriptive statistics.

Objective One

What type of handoff created the highest level of self-efficacy of a nurse receiving a patient from the PACU? No results pertaining to the written handoff format were collected. Findings from this project suggested that a face-to-face handoff created a higher sense of self-efficacy in floor nurses than with telephone report. A nurse experiencing an isolated incident of lack of a handoff resulted in the lowest self-efficacy score. Self-efficacy scores were measured utilizing components of the NCSES developed by Dr. D. Welsh. Several questions on the NCSES were not used for evaluation purposes, as question components lacked correlation to handoff processes. Cumulative group scores were obtained and calculated. Based upon findings in literature reviewed and findings of this project, nursing self-efficacy scores appeared to be enhanced by the face-to-face handoff. Increased nurse satisfaction and perceptions of safety with face-to-face handoffs were found in the work of Evans et al. (2012), Maxson et al. (2012), Sherman et al. (2013), Sand-Jecklin and Sherman (2014), Taylor (2015), and Holly and Poletick (2014). Face-to-face handoffs created a greater sense of knowing the patient, plan of care, double checking, and closer surveillance. Physical presence of the nurse during a handoff was an important component for perception of safety, usefulness, and satisfaction, as implicated in

Henneman (2017). Consequentially, the objective of finding which type of handoff from the PACU promoted higher self-efficacy of receiving nurses has not been determined. The project only suggested that face-to-face handoffs created higher self-efficacy in nursing staff than telephone handoffs. However, additional research with larger sample sizes is required. The principal investigator's small sample size within a large academic hospital and with younger nurses may have influenced findings. Comparison among other nurse populations within Barnes-Jewish Hospital may be beneficial. Potential lower acuity patients in the second sample may have altered scores. Findings potentially could vary in smaller community hospitals with a different patient population and staff demographics. Key barriers to obtaining survey data were higher acuities of patients, nursing activities, staffing levels, and volume of procedures. The first survey was done in late summer. The second survey was done at the end of the year, traditionally a time of increased surgery volume, due to patients having met their insurance deductible and scheduling elective procedures around the holiday season. Nursing survey fatigue as suggested by lower response rates was an unintended consequence encountered within the second step of the project. Also, higher daily volumes of surgeries posed challenges to obtaining participation during the second survey.

Objective Two

Did implementation of an education offering to PACU nursing staff on the five p's of handoff enhance the self-efficacy of receiving nursing staff? Findings were inconclusive for this project. Data for BSN educated nurses suggested an improved self-efficacy score post-education. Nursing cumulative self-efficacy scores for the pre-education BSN group were 8.50. Post-education BSN group self-efficacy scores were 8.76, indicating improvement. It was postulated that lower acuity patients were found within the post-education group. However, no

post-education data was available for ADN or diploma graduates. Further study is needed to determine the effect of education background on nurse self-efficacy scores. Detailed study of PACU nurse compliance rates with utilization of the five p's of handoff is essential. Compliance rates for PACU nursing staff were not measured in this project. The impact of compliance versus non-compliance is unknown. Lee et al. (2016) implicated that an education intervention with nursing students on handoff increased self-efficacy scores. However, extrapolation of those findings to this project is not recommended. Robinson (2016) and Bruno and Guimond (2016) suggested that well-structured handoffs increase the transfer of information. Utilization of the five p's of handoff could be substituted for other handoff tools such as the ISHAPED Handoff Tool described in Herbst, Friesen and Speroni (2013). However, in their project, nurse satisfaction scores were not detailed. Although the NCSES was deemed a valid and reliable measurement tool by Dr. D. Welsh, nurse perceptions were used for scoring self-efficacy levels. However, all questions on the NCSES were not used for purposes of this project. Unintended consequences of this project included nurse perceptions being entirely subjective and lacking objectivity. Additional research to determine if tools such as the five p's of handoff influence self-efficacy levels of receiving nurses is required.

Sustainability

Findings of this project revealed the importance of bedside handoffs for enhancement of patient outcomes. Following the culmination of existing practice inquiry, partnerships with organizational stakeholders were established. Implementation of the project assisted in translation of evidence into practice. Evaluation of newly implemented practices within the organization was accomplished by the project (Waldrop, Caruso, Fuchs, & Hypes, 2014).

EC as PIE (Enhance, Culminate, Partnership, Implement, Evaluation) Model**Enhance/Culminate**

The project supported the need for a structured pattern of handoff from the PACU to a receiving nursing division at Barnes-Jewish Hospital. Of clinical significance, consistency in patterns of communication assisted in promotion of safety as related to handoff processes. Nurses' responses suggested that face-to-face handoff improved communication that ultimately impacted perceptions of safety, ability to provide care, and increased patient, family, and nurse satisfaction. The aforementioned components appeared to promote greater self-efficacy in nursing staff. Previous practices were not conducive to promotion of self-efficacy, as reported anecdotally with the written handoff. Future improvement in handoff processes may contribute to an increase in nursing self-efficacy levels among staff.

Logistics with high daily surgical caseloads potentially impacted the ability to provide face-to-face handoff for each patient leaving the PACU. Recommendation that face-to-face handoffs continue to be required for all high-acuity patients is made. Evidence suggested that telephone reports offer lower self-efficacy in nurses than the face-to-face handoff.

Partnership

Strong support from Dr. J. Martin, vice-resident of perioperative services, promoted partnership among anesthesia providers, nursing staff, and others, in the vital role that structured handoffs provided for patient safety. Department culture mandates patient handoffs due to safety considerations for the patient. Nursing leadership in the perioperative area continues to strongly support utilization of telephone or face-to-face handoff as the standard of care. Partnerships between all departments in the hospital as related to handoffs are being evaluated, developed,

and strengthened at an administrative and provider level. Work of the partnerships solidified during the project continues.

Implement/Evaluation

During the initial phases of this project, the handoff culture was changed under Dr. Martin's leadership. Data collection on floor to preoperative handoff processes was implemented by the department. Also, preoperative to operating room handoff compliance continued to be closely monitored by data extraction and direct observation of staff. Ongoing education of PACU nursing staff on structured handoffs, whether using the five p's or the Barnes-Jewish Hospital handoff card has occurred. Emphasis on educating staff continues at monthly staff meetings. Direct observation of PACU nursing staff during the handoff process to the receiving division will be implemented in the future to determine if staff are using structured handoffs such as the five p's. Use of the standardized format for giving either a face-to-face or telephone handoff suggested improvement in nurse self-efficacy. Additional studies related to the relationship between education background, years of nursing experience, and age of the nurse and self-efficacy are needed. Compliance monitoring of PACU staff utilizing standardized tools for handoff and relation to nurse self-efficacy is suggested for future research. Larger sample sizes for data collection are required in future studies.

Future planning will incorporate the implementation of Epic for the new electronic health record at Barnes-Jewish Hospital in June 2018. As discussed by Chapman et al. (2016) and Staggars and Blaz (2013), use of the EHR in patient handoff increased staff satisfaction. New workflow processes with Epic implementation will occur and potentially could impact handoff in clinical areas. Utilization of structured handoffs with tools such as the five-p's built within the Epic system will be needed as guides.

Current and future states will continue to encourage use of face-to-face handoff when possible, or a telephone handoff report if not feasible. Avoidance of written handoff has been promoted due to half-life issues of recorded data as found in Rosenbluth et al. (2016).

Conclusions

Handoff processes between the PACU and receiving nurse on surgical floors has not been studied previously. Lack of a standardized handoff format at Barnes-Jewish Hospital was the trigger that raised awareness for a change in handoff processes. Safety events related to poor handoff processes also triggered a need to determine if past practices were promoting safety of the patient and self-efficacy of nursing staff.

Review of the literature suggested that face-to-face handoffs created higher levels of satisfaction and safety for staff and correlation with self-efficacy. The results from the NCSES questions in this project indicated increased self-efficacy scores among the face-to-face handoff recipients. Additionally, data suggested that the use of the five p's as a guide for PACU staff during patient handoff increased the receiving nurse self-efficacy scores. The analysis of data revealed that providing structure in division to division handoff processes increases self-efficacy within the sample of nurses at Barnes-Jewish Hospital. Noteworthy, the sample nurse population at Barnes-Jewish Hospital was generally younger and with less years of experience than the general population of nurses. Increased self-efficacy could promote greater nurse/patient satisfaction. Greater nurse satisfaction could impact recruitment and retention rates of the facility in a positive manner. However, additional study is required to support assertions.

Future research should incorporate paper surveys rather than an online survey tool such as Survey Monkey. Computer skills are required of staff to fill out online surveys. Although the survey used in this project took approximately two minutes to complete, logging onto a computer

and finding the appropriate site takes additional time. Paper surveys could potentially be completed faster on the spot, leading to higher response rates. Future research should be conducted on handoff processes between intradepartmental areas, such as the emergency department, cardiac catheterization or GI lab, and other areas that interface with post-procedure units.

Prior to the summer of 2017, the majority of handoffs at Barnes-Jewish Hospital were performed via a written handoff tool. Issues with missing report sheets, illegibility, and accuracy contributed to nursing perception that communication errors were occurring at the time of handoff. Handoff miscommunication has been associated with an estimated 80% of preventable adverse events in a hospital (Frankel et al., 2012). This point of vulnerability illustrated the need for further research into PACU to surgical division handoff processes that promoted greater self-efficacy in nursing staff to provide care as demonstrated within the theories of Orlando and Watson. Findings of this project suggest that face-to-face handoffs primarily create higher levels of nursing self-efficacy.

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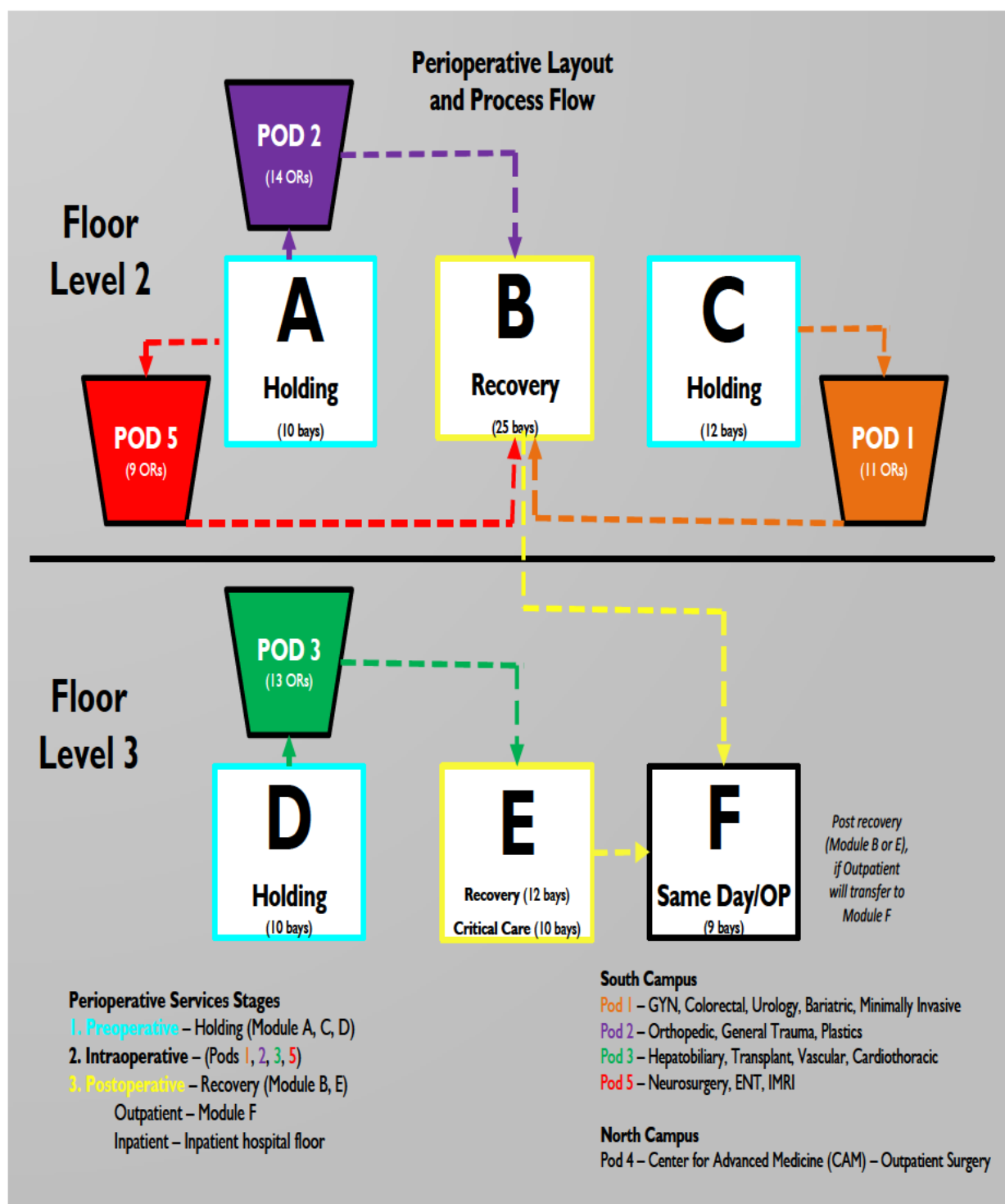
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Appendix A



Flow Processes in Perioperative Areas at South Campus

Barnes-Jewish Hospital, St. Louis, Missouri.

Appendix B

Patients Being Discharged From PACU

- Identification of patient and procedure
- Important past medical history
- Any complications intraoperative
- Any complications postoperative
- I and O's
- Labs/images results or pending
- Medications given and resolutions
- Regional blocks
- OSA risk
- Patient placement
- Telemetry ordered

Appendix C

CHART HAND OFF CHECKLIST

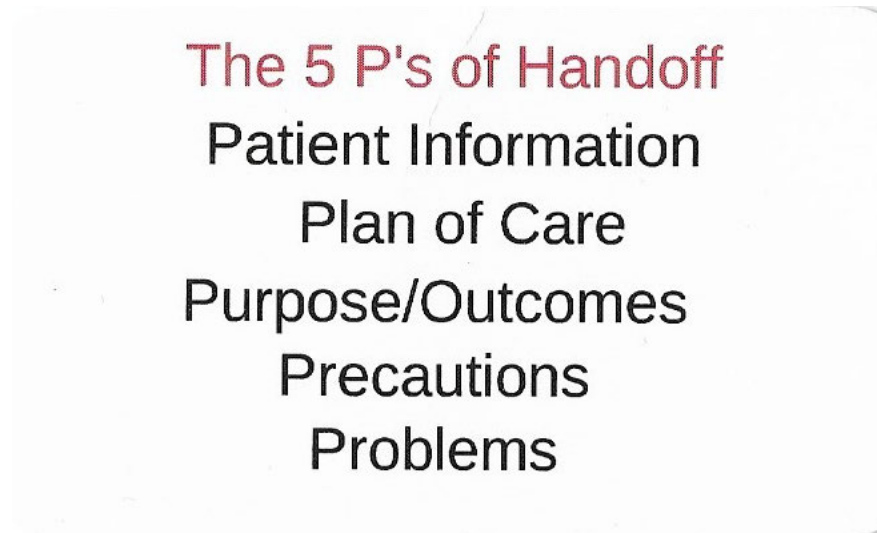
PT INFO	Name:		Case Number:		PROCEDURE:
			NKDA Allergy		
HISTORY	<input type="checkbox"/> HTN	<input type="checkbox"/> Asthma	Other:	Isolation:	Translator:
	<input type="checkbox"/> COPD	<input type="checkbox"/> Seizures			
	<input type="checkbox"/> Chronic pain	<input type="checkbox"/> Depression	DM Type 1	Fall Risk:	Implantable Device:
	<input type="checkbox"/> Cardiac history	<input type="checkbox"/> OSA	DM Type 2	<input type="checkbox"/> yes <input type="checkbox"/> no	
PREOP	VS:	Mental Status:	Skin Integrity:	Betablockers:	HCG Results:
		LVAD		<input type="checkbox"/> yes <input type="checkbox"/> no	<input type="checkbox"/> Positive <input type="checkbox"/> Negative
REGIONAL	PREOP		POTENTIAL POST OP BLOCK		RAS Nurse 314-362-3907
	<input type="checkbox"/> Regional Block		<input type="checkbox"/> Yes → Call Regional Anesthesia		Regional Anesthesia phone: _____
INTRAOP	<input type="checkbox"/> Spinal		<input type="checkbox"/> No → Reason: _____		
	<input type="checkbox"/> Epidural		<input type="checkbox"/> Maybe → Call Regional Anesthesia		
	Dermatome _____				
	General	MAC	Spinal	Versed	Zofran
	ET	LMA	Epidural	Fentanyl	Pepcid
	Airway:	NP	ORAL	Dilaudid	Tylenol
	Complications		Toradol	Crystalloid	Colloid
			Antibiotic	EBL	U/O
POSTOP	Relaxed		Reversed		Positioning
	IV Access	Fluids/Gtts	Skin Breakdown		Drains
	Assessment:	Ventric	COMPASS ORDERS		LABS
		Clamped	CXR		CBC
		Unclamped	Hip/Knee/Pelvis		BMP
	Surgical Wound:	Height of chamber _____	PCA		Trops
		Lumbar Drain			Coags
	Vitals:	Amount to be emptied each hour _____			Glucose
Misc/To Do:		Surgical MD Phone Number:			
Sign Out Time:		Boarding Time:		Destination:	

BJ 14-1195-3747 (01/27/17)

PLACE IN FRONT OF CHART

Example of Written Handoff Sheet at Barnes-Jewish Hospital

Appendix D



Pocket Reference Card Given to PACU Staff at South Campus

Barnes-Jewish Hospital, St. Louis, Missouri

Appendix E

Nursing Care Self-Efficacy Scale (NCSES)

Used with permission of Dr. D. Welsh, University of Kentucky

This questionnaire is designed to help you gain a better understanding of your nursing practice capabilities based on the type of patient handoff you receive. Think about the specific requirements for your job as you complete this form. In the right-hand column labeled **Confidence**, rate how confident you are that you can perform each of the described activities in the workplace **at this point**.

Rate your degree of confidence by recording a number from 0 to 10 using the scale below:

0	1	2	3	4	5	6	7	8	9	10
I cannot			Moderately				Certain I			
do at all			certain I can do				can do			

My degree of confidence to be able to: Complex Nursing Care	Confidence 0-10
1. Promote patient control over decision-making with hospital care.	
2. Deliver care that addresses cultural differences.	
3. Teach patients about self-care for optimal health.	
4. Use research findings in practice.	
5. Manage interpersonal conflict in the workplace.	
6. Use resources effectively to meet patient care demands.	
7. Guide team members when situations rapidly change.	
8. Provide emotional support for hospitalized patients.	
9. Delegate patient care tasks appropriately.	
10. Collaborate effectively with the inter-professional team.	
11. Intervene to minimize patient pain and suffering.	

Fundamental Nursing Care	
12. Safely perform the technical skills required for patient care.	
13. Prioritize interventions to address changing patient needs.	
14. Implement interventions to effectively treat patient problems.	
15. Interpret patient data from a variety of sources.	
16. Evaluate patient response to care.	

Appendix F

6200/6200 OU, 7300/7400, 17400 Staff Nurse Consent Letter



Dear Nursing Colleague:

I am inviting you to participate in a quality improvement project because you have received a patient handoff from the Post-Anesthesia Care Unit (PACU) at Barnes-Jewish Hospital. The purpose of the project is to determine which type of patient handoff method from the PACU nurse to the receiving nurse creates the highest level of self-efficacy (confidence) levels to provide patient care. Also, PACU nurses will be receiving education on the Five P's of Handoff, which includes patient information, plan of care, purpose and desired outcomes, precautions, and problems to improve handoff processes. The project is being undertaken by a doctoral student at McKendree University, who is also an assistant nurse manager in the PACU at Barnes-Jewish Hospital.

Should you agree to participate, we would like you to fill out a simple survey asking questions about how confident you felt in providing nursing care after receiving patient handoff from the PACU. Questions are from the Nursing Care Self- Efficacy Scale (NCSES) developed by Dr. Welsh at the University of Kentucky. Participants are free to skip any questions that they prefer not to answer. Should you decide not to participate, thank you for your time and consideration.

No known risks exist for participation in this quality improvement project. Potential benefits realized could be improved safety of patients. Increased nursing staff satisfaction and confidence through improved handoff methods may also be a benefit.

All information you provide will be confidential. No identifying information from participants, other than your age, level of education, years of employment within the hospital setting, and nursing division will be collected.

The survey may be accessed by completing the NCSES on Survey Monkey found at this link:

<https://www.surveymonkey.com/r/bjhfollowup>

Data will be collected over six-week periods. The first six weeks of data collection will precede the PACU education offering. After PACU staff receive training on the five p's of handoff, additional data will be collected from your division again over six weeks.

Your participation in this project is completely voluntary. You may choose not to take part at all. If you decide to participate in the project, you may stop participating at any time. Any data that was collected as part of this project will remain as part of the records and cannot be removed. However, federal regulatory agencies and McKendree University Institutional Review Board (a committee that reviews and approves research studies) may inspect and copy records pertaining to this research. If we write a report about this study, we will do so in such a way that you cannot be identified. You will not incur any costs for being in this quality improvement project. You will not be paid for being in this quality improvement project.

We encourage you to ask questions. If you have any questions about the quality improvement project itself, please contact the principal investigator: Christopher Guelbert MSN, RN at [REDACTED]. If you have questions, concerns, or complaints about your rights as a participant, please contact the Institutional Review Board or Dr. Janice Albers at McKendree University at [REDACTED]. Thank you very much for your consideration. Completion of the NCSSES via the Survey Monkey link will indicate your willingness to participate in this project.

Sincerely,

Christopher Guelbert MSN, RN

Doctoral Nursing Student at McKendree University

Appendix G



Doctor of Nursing Practice Program

DNP FINAL PROJECT TEAM FORM (due by 1st week Spring Semester, Year One)

Section 1: To be completed by Student (return by email to the Graduate Program Secretary)

Student's Name: Christopher S. Guelbert

Home Address: [REDACTED]

Email Address: [REDACTED] [REDACTED]
(McKendree) (Home)

Home/Cell phone: [REDACTED]

Proposed Chair: Dr. Janice Albers Proposed McKendree Member: Dr. Kelli Whittington

Proposed External Stakeholder: Gail Davis Phone: [REDACTED]

Address: [REDACTED]

Email: [REDACTED]

Proposed Project Title: Effect of Patient Handoff Method on Nurse Self-Efficacy

Anticipated Graduation Date: May 2018

Section 2: To be completed by Chair (return by email to the Graduate Program Secretary)

Please confirm your agreement to serve on the DNP Final Project Committee for the student indicated above by typing your name and today's date and selecting the appropriate response.

I [REDACTED] X Agree Do Not Agree

to act as chair of the above-named student's DNP Final Project Committee.

Date: 5/2/17

Section 3: To be completed by McKendree Committee Member (email to the Graduate Program Secretary)

Please confirm your agreement to serve on the DNP Final Project Committee for the student indicated above by typing your name and today's date and selecting the appropriate response.

I [REDACTED] X Agree Do Not Agree

to act as the second committee member of the above-named student's DNP Final Project Committee.

Date: 5/2/2017

Section 4: To be completed by External Stakeholder (email to Graduate Program Secretary)

Please confirm your agreement to serve on the DNP Final Project Committee for the student indicated above by typing your name and today's date and selecting the appropriate response.

I [REDACTED] X Agree Do Not Agree

to act as the external stakeholder for the above-named student's DNP Final Project Committee.

Date: 5/11/2017

For Office Use Only:

Received from Student:	_____	Initials: _____
Received Chair Acceptance:	_____	Initials: _____
Received McKendree Member Acceptance:	_____	Initials: _____
Received Stakeholder Acceptance:	_____	Initials: _____

Appendix H

September 12, 2017

Christopher Guelbert, MSN, RN
Assistant Nurse Manager, PACU
Barnes-Jewish Hospital
One Barnes-Jewish Hospital Plaza
St. Louis, MO 63110

Dear Mr. Guelbert,

Thank-you for the re-submission of your quality improvement proposal titled "Effect of patient handoff methods on nurse self-efficacy". The committee has approved your quality improvement project proposal, with the concern that you may not garner the data needed to address your project question. We have outlined recommendations, as discussed with you in the review meeting, which would greatly increase the meaningfulness and rigor of your DNP project. You do not need to come back to the committee. We recommend that you discuss our recommendations with your advisor.

Recommendations:

- 1) **Instrument:** The instrument that one utilizes should allow you to collect data that will be able to answer the questions proposed in the quality improvement project. The proposed instrument, the Nursing Self-Efficacy Scale (NCSES), addresses nursing self-efficacy on a more global scale as opposed to a more immediate change in self-efficacy as a result of an educational intervention (Five P's).

Since the review meeting on September 7, you sent the article, Self-efficacy measurement and enhancement strategies for medical-surgical clinical nurses, for clarification as to the use of the NCSES tool for your proposal. However, the article further validates the fact that the instrument may not be the best instrument for your proposed QI project.

As discussed in the review meeting, it would be more appropriate to find an instrument that would speak to your proposed project. As noted in your literature review, other studies have used handover specific instruments. While this changes the intent of your project it would most likely yield answers to the impact of the new 5P handover report.

If you choose to use the NCSES, it would be of benefit to contact Dr. Welsh regarding a) if any further subscales have been developed from this tool, b) if you have permission to modify the tool and 3) what she would advise regarding modification of the tool to better address your project questions.

Additional questions regarding nurse perceptions (q. 4, 5 & 6) can be improved by operationalization of them: Safety, usefulness and satisfaction with handoff.

You may want to delete these questions if you are going to modify the NCSES instrument or find another instrument that would be inclusive of a definition of safety, usefulness and satisfaction. Furthermore, we recommend that questions should also be developed to assess the Five P's, for instance: Patient Information. Develop a question(s) that speaks to self-efficacy in relation to Patient Information.

- 2) **Five P's:** You should include a more detailed explanation of what the Five P's are as well as what the education entails, including timeframe. This information will be useful in gaining unit/floor approval as well as nurse participation.
- 3) **Letters of Support and Email Reminders:** You will need to have the support of each area you wish to conduct your QI project. Additionally, you will need to have approval to email nurses information regarding your QI project as well as sending subsequent participation reminders (also noting how many reminders will be sent). We suggest that you obtain documentation of these approvals through emails and maintain for your records.
- 4) **Confidentiality:** In the letter to the nurses, state that floor/unit leadership will not have access to the individual data collected. Data will only be shared in the aggregate.
- 5) **Pizza Party:** Eliminate the pizza party incentive. As written, this incentive may lead to a competitiveness amongst nursing staff instead of focusing on the work of the project itself. Instead, give each participating floor/unit a 'thank-you' at the end of the entire project. This thank-you could be in the form of a pizza party, cake, etc.

Please do not hesitate to contact us with any questions regarding the proposal review. We wish you all the best with your quality improvement project.

Sincerely,



Jennifer A. Sledge, PhD, MSW
Research Scientist
Review Committee Co-Chair
Department of Research



Lynn Schallom, RN, PhD, CCNS, FCCM
Director, Department of Research
Review Committee Co-Chair
Department of Research



Appendix I

Written Approval of Dr. Welsh

Guelbert, Christopher S

|
Tue 11/15/2016, 8:56 PM

Dear Dr. Welsh:

I am a DNP student currently at McKendree University in Lebanon, Illinois. I have discovered and appreciated your development of the Nursing Care Self-Efficacy Scale (NCSES) and am contemplating utilizing it for my doctoral capstone project. I anticipate using Orlando's Nursing Process Theory for my theoretical framework.

Currently, my project is in the infancy stages, and I hope to explore differences of self-efficacy in nurses to provide care that they receive from the PACU postoperative. I work at Barnes-Jewish Hospital in St. Louis, Missouri, which is affiliated with Washington University School of Medicine. My role is one of several Assistant Nurse Managers in the PACU. Our PACU utilizes three handoff tools to floor nurses, either a written document, telephone report, or face-to-face handoff. I am theorizing that self-efficacy scores will be higher in nurses in the face-to-face handoff group versus the written or telephone group.

I would like to request your permission to use this tool in the course of my research studies in 2017-2018.

Any other ideas or information about the use of this tool would be greatly appreciated.

Sincerely yours

Christopher Guelbert RN, MSN, CCRN
McKendree University School of Nursing
Lebanon, Illinois

WD

Welsh, J. Darlene [REDACTED] >

Reply all |

Wed 11/16/2016, 12:35 AM

Guelbert, Christopher S

Feel free to use the tool.

Sent from my T-Mobile 4G LTE Device

WD

Appendix J

McKendree University IRB Approval

Re: Barnes Final Approval Letter

Seibert, Helene P

Thu 9/28/2017, 9:38 AM

Guelbert, Christopher S;
Albers, Janice L
RESEARCH PROJECT

Hello Christopher!

Dr. Beard and I have reviewed your proposal and amendments and concur that your *Quality Improvement Project* is approved for implementation.

Best of luck on your research endeavors,

Dr. Helene Seibert

Chair, IRB committee

Dr. Roxanne Beard

Co-Chair, IRB committee

Appendix K

Survey Questions for Participants

Note: Rated on Scale of 0-10

1. My degree of confidence to collaborate effectively with the inter-professional team.
2. My degree of confidence to intervene to minimize patient pain and suffering.
3. My degree of confidence to safely perform the technical skills required for patient care.
4. My degree of confidence to prioritize interventions to address changing patient needs.
5. My degree of confidence to implement interventions to effectively treat patient problems.
6. My degree of confidence to interpret patient data from a variety of sources.
7. My degree of confidence to evaluate patient response to care.
8. What type of handoff did you receive?
9. On a scale between 0 (least safe) to 10 (highest level of safety), would you rate the level of safety with the handoff received?
10. On a scale between 0 (no level of usefulness) to 10 (highest level of usefulness), would you rate the level of usefulness with the handoff received?
11. On a scale between 0 (no satisfaction) to 10 (highest satisfaction), would you rate your satisfaction with the handoff received?
12. What is your age range in years?
13. How many total years have you been employed in a hospital setting as a Registered Nurse?
14. What is your current highest level of nursing education?
15. What nursing division did you receive the handoff on?

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