# STANDARDIZING NURSE-TO-NURSE PATIENT HANDOFFS IN A CORRECTIONAL HEALTHCARE SETTING: A QUALITY IMPROVEMENT PROJECT TO IMPROVE END-OF-SHIFT NURSE-TO-NURSE COMMUNICATION USING THE SBAR I-5 HANDOFF BUNDLE

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## ABSTRACT

Jemma Glenda Superville: Standardizing Patient Handoffs in a Correctional Healthcare Setting: A Quality Improvement Project to Improve Nurse-to-Nurse end-of-shift Communication Using the SBAR I-5 Handoff Bundle
(Under the direction of Janna Dieckmann)

**Background**. Ineffective nurse-to-nurse communication at handoffs can result in patient harm, including death. Effective communication addresses key technical and non-technical components including: the comprehensiveness and veracity of information exchanged, as well as the mutual understanding of the information shared. When either of these features is missing, ineffective communication results. In the jail setting communication is often based on patient information that is fractured, poorly accessible, and non-verifiable. Of the jail nurses in the study setting, 57% are foreign born; 55% speak a non-English native language, and 35% trained and practiced in foreign countries. This "internationalization" of nursing with the potential for variations in how nurses interpret and act on information exchanged can severely undermine patient safety.

**Purpose**. The purpose of this DNP project was to utilize evidence-based practice processes to standardize the content and format of the nurse-to-nurse handoff communication at the jail, and to explore whether these structural and process changes would improve the quality of the handoff communication.

**Design**. This project explored the impact of an evidence-based communication protocol, the SBAR I-5 Handoff Bundle, on the quality of the nurse-to-nurse handoff communication

using a convenience sample of nurses at a 22-bed acute medical services unit of a jail. The study employed a mixed methods approach utilizing questionnaires, observations, interviews, and retrospective chart reviews to collect and compare pre/post-test data.

**Methods**. The primary investigator observed morning and evening end-of-shift handoffs. Problems identified were: inconsistent handoff start and ending times; wide variability in report content, format and style; the absence of information verification; and failure to validate the mutual understanding of information shared. Differences in nurses' pre/post-test survey responses, interviews, and handoff observations were analyzed. Nurses' interview responses were examined for salient themes.

**Results**. Post-intervention, jail nurses reported improved handoff quality. Although a marginal increase in the patient care error rate occurred, a 10-fold increase in the handoff error capture rate improved patient safety overall. Thematic analysis yielded two themes: Improved communication and improved team dynamics.

**Discussion/Conclusion**. This study identifies deficiencies in the jail nurse handoff structure and process that were addressed by the study intervention. The study results indicate that standardization of jail handoff communication combined with information verification and validation features can improve the quality of jail nurses' handoffs.

I dedicate this project to my parents, Cedric and Stella Millington for instilling in me at an early age the value of a formal education, even though they themselves were not as privileged to have had access to the same.

This achievement is also dedicated to my grandchildren Kwame Jr., Maliyah, Malakai, and Kaleb, that it will serve as an inspiration to each of you as you lay the foundational steps of your life-long educational journey.

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| AACCN | American Association of Critical Care Nursing |
| ACU | Acute Care Unit |
| AHRQ | Agency for Healthcare Research and Quality |
| APA | American Psychological Association |
| BSN | Bachelor of Science in Nursing |
| ED | Emergency Department |
| HER | Electronic Health Record |
| EMR | Electronic Medical Record |
| HES | Handover Evaluation Scale |
| IHI | Institute for Healthcare Improvement |
| IOM | Institute of Medicine |
| IRB | Institutional Review Board |
| MICU | Medical Intensive Care Unit |
| MOU | Medical Observation Unit |
| NCBON | North Carolina Board of Nursing |
| PCICU | Pediatric Cardiac Intensive Care Unit |
| PICOT | Population Intervention Comparator Outcome Timeframe |
| PRISMA | Preferred Reporting Items for Systematic Reviews and Meta-Analyses |
| PRN | As needed |
| PSC | Public Safety Center |
| PT | Part-Time |
| QI | Quality Improvement |

| | |
|---|---|
| RN | Registered Nurse |
| RRT | Rapid Response Team |
| SBAR | Situation Background Assessment Recommendation |
| SPO | Structure Process Outcome |
| STD | Sexually Transmissible Diseases |
| SW | Suicide Watch |
| TJC | The Joint Commission |
| UNC-CH | University of North Carolina at Chapel Hill |
| US | United States |
| WCDC | Wake County Detention Center |

# CHAPTER 1: INTRODUCTION

Every day in our nation's hospitals, the care of hundreds of thousands of patients is transferred from one provider to another. This process typically occurs two to three times a day for each patient, and can occur even more often when caregivers change mid-shift. Communication exchanges between changing caregivers are designed to relay pertinent patient information that the incoming caregiver will use to safely continue the patient's care. The Joint Commission, one of the most widely known advocates for patient safety, defines safe communication as that which is "clear, precise, and accurate" (TJC, 2012).

Communication refers to an exchange of information between a sender and receiver, in which participants have a mutually shared understanding of the message conveyed (Berger, Sten, & Stockwell, 2012; Dayton & Henriksen, 2007; Dracup & Morris, 2008; The Joint Commission TJC, 2012). In effective communication, the sent message is clear, the channel is appropriate, and communication "noise" is absent. The clinical handoff report is a crucial communication event in patient care, but is also a major contributor to adverse events and poor clinical outcomes (Blouin, 2011; Dayton & Henriksen, 2007; Dracup & Morris, 2008; Foster & Manser, 2012; Watson, Manias, Geddes, Della, & Jones, 2015). In fact, in a 2001 report, the Institute of Medicine (IOM) identified handoff reports' vulnerability to errors, and concluded that a safe report is one that contains readily accessible information, and is devoid of information loss and communication deficiencies (Smeulers, Lucas, & Vermeulen, 2014). When nurse-to-nurse communication meets this standard and is delivered in an appropriate manner, the information

recipient is much more likely to properly interpret the information received. On the other hand, defective communication is fraught with deficiencies that can lead to unintended outcomes. In healthcare, effective communication takes on additional importance because deficient communication can lead to serious patient harm, suffering, and even death (Agarwal, Saville, & Slayton, 2012; The Joint Commission, 2013).

Recognizing the important link between effective nurse-to-nurse communication and patient safety at care transition, hospital leadership has invested considerable resources into identifying barriers to effective communication with the expectation that removal of these barriers would improve patient safety. Barriers to effective communication are multifactorial and arise from a complex interplay of structural and process factors at the individual, group, and organizational levels (Dayton & Henrikson, 2007). Researchers have identified several structural barriers to proper nurse-to-nurse handoff communication. These may include language barriers, frequent interruptions, deficient information, information overload, cognitive overload, wide variability in report content and format, and differences in authority gradients between in-coming and off-going nurses (Dayton & Henrikson, 2007; Gephart, 2012; Goldsmith et al., 2010; Welsh, Flanagan, & Ebright, 2010).

Researchers have noted the wide variability of the handoff report content and style, and have questioned the "reliability and efficiency of the handoff process" (Burton, Kashiwagi, Kirkland, Manning, & Varkey, 2010). To close this gap in handoff reporting content and style, and to improve handoff communication, some experts have promoted the adoption of standardized, structured communication protocols targeting clinicians (Gephart, 2012; Watson et al., 2015). These experts argue that the introduction of a standardized patient handoff during care transition, such as SBAR (Situation Background Assessment Recommendation), can potentially

increase the completeness of information transferred, reduce patient care errors, promote continuity of care, and increase nurse satisfaction (Abraham, Kannampallil, Patel, Almoosa, & Patel, 2012; Frietag & Carroll, 2011; Patterson & Wears, 2010; Staggers, Clark, Blaz, & Kapsandoy, 2011; Welsh et al., 2010).

Manser et al. (2010) found that existing handoff research over-emphasized the "technical" aspects of communication, such as the accuracy and completeness of the information exchange; the psychological and physical environment surrounding the transfer; and the impact of these factors on communication effectiveness. Further, this occurred while neglecting the "non-technical" roles of communication such as socialization, training, the maintenance of group cohesiveness, and organizational learning (Berger et al., 2012; Deering at al., 2011; Manser et al., 2010). Manser et al (2010) argued that much of the work on improving handoff communication conducted before their study, focused on ensuring the veracity and completeness of the information transferred, while failing to address the social aspects of communication and their impact on patient safety.

In addition to content accuracy, effective communication is also founded upon a shared understanding between the sender and receiver of the message conveyed. Such reciprocal understanding assumes even greater significance in circumstances where there are wide disparities in training, skills, experience, and/or knowledge between the sender and receiver, which is often the case in the healthcare field. Given this context, it is imperative to build a component into the handoff structure that validates the mutual understanding of communication exchanges between the in-coming and off-going nurses at shift changes.

Communication in the jail setting has a unique set of challenges. Patient information in this setting is often inaccurate for many reasons: intentional falsification of information by

patients; lack of full patient disclosure due to security presence during nurse-patient interviews; patient mistrust; and rebellion (Costa & Lusk, 2017). Unintentional inaccuracies attributable to patient memory deficits related to drug impairment or the residual effects of chronic disease, also contribute to information gaps in the jail setting (Costa & Lusk, 2017). Jail nurses' attempts to validate patient information can also be frustrated by patients' refusal to provide consent for release of information, by patients' provision of incorrect information sources, and lack of connectivity of jail information systems with community health providers. Collectively, these barriers create information deficits that can undermine the quality of the nurse-to-nurse handoff communication, provide a source of frustration for nurses, and potentially threaten patient safety.

## Problem Statement

Patient safety and continuity of care are heavily dependent on the accuracy of information passed on to an incoming nurse at handoff (Chung, Davis, Moughrabi, & Gawlinski, 2011). In addition to the accuracy and completeness of the information exchanged, the mutual understanding of these communication exchanges between clinicians at handoff is critical to effective communication (Chaboyer et al., 2009; Manser et al., 2010). Care transitions, including the patient handoff, represent a time of vulnerability during which the patient is at risk of harm due to incomplete or inaccurate information transfer, and/or due to misunderstood communication exchanges between nurses.

When information passed to the incoming nurse contains gaps, the incoming nurse often expends a considerable amount of time resolving such errors. For the incoming nurse, ineffective handoffs create uncertainty about the patients' health, undermine confidence in advancing the patient's plan of care, and become a source of frustration and dissatisfaction (Sherwood, 2012). At the organizational level, communication failures that result in medical errors impact the

organization by increasing the healthcare budget through higher costs incurred for healthcare services at tertiary care institutions. Additionally, deteriorations in patient health status that can be linked to nurse-to-nurse handoff errors have the potential to increase litigation from aggrieved patients.

Baseline observations of handoff processes in the health care areas at the local county jail reveal structural and process deficiencies that could adversely impact the accurate transfer of information at shift change. These communication deficiencies in the nurse-to-nurse handoff at the local county jail can be linked to poor outcomes including delayed, missed, or incorrect treatments, which potentially increase patients' morbidity. In the jail setting where patients have higher disease burdens, and lower physiologic reserve (Biswanger et al. (2009) compared to the general population, the consequences of failed communication can be catastrophic.

## Background and Significance

The centrality of effective communication in patient safety and continuity of care is widely acknowledged (Braun, 2012; Drach-Zahavy & Hadid, 2014; Thomas & Donohue, 2012; Vardaman et al., 2012). Researchers and healthcare systems experts have explored strategies to improve the nurse-to-nurse handoff communication process. Their findings have linked gains in the handoff process to improved outcome measures, including completeness of information transfer, reduction in patient care errors, reduction in handoff communication errors, increased continuity of patient care, and increased nurse satisfaction (Arora, Johnson, Meltzer, & Humphrey, 2008; Thomas & Donohue, 2012; Vardaman et al., 2012).

In a quest to improve patient safety, many American healthcare organizations have responded to The Joint Commission's call to improve communication by subjecting the nurse-to-nurse patient handoff to increased research scrutiny, focused quality improvement efforts, and

performance audits (Cohen & Hilligoss, 2010; Hilligoss & Cohen, 2011; Schuster et al., 2014). Employing a behavioral approach, some hospitals have responded by adopting more structured clinical handoff protocols (Dayton & Henriksen, 2007; Gephart, 2012; Watson et al., 2015; Smith & Flanders, 2014). Some health system managers have promoted the practice of increased patient involvement in the handoff report through bedside shift reports (Sand-Jecklin & Sherman, 2014; Smith & Flanders, 2014). Other health system managers have opted to integrate the electronic health record (EHR) and computerized tools as alternative strategies for reducing handoff errors (Anderson et al., 2010; Braun, 2012; Davis et al., 2015; Frietag & Carroll, 2011; Nelson & Massey, 2010).

Over nine million inmates enter U.S jails annually with an average length of stay of 45 days and a median length of stay of nine days (Glowa-Kollisch et al., 2014). With such large jail populations and high turnover rates, the EHR is a useful quality improvement tool in tracking patients' health status throughout their stay and across repeated visits. Use of an EHR reduces testing redundancies by providing readily accessible data, and facilitates continuity of care by establishing vital linkages among community health care providers. Notwithstanding the potential benefits of the EHR, jail health systems have been notably slow in adopting this technology. The Wake County Detention Center presently utilizes a manual health record, and although officials have considered introducing an EHR, plans to do so are still in the formative stage.

## The Case for Change

The Institute of Medicine (IOM) estimated in 2010 that 100,000 deaths occur every year from medical errors, many of which are preventable (Papaspyros, Javangula, Adluri, & O'Regan, 2010). A more recent study of deaths occurring from preventable medical errors in hospitals

estimates that the figure in 2013 was closer to 440,000 per year, making it the third leading cause of death in the U.S. after cancer and heart disease (James, 2013). The Joint Commission (TJC) report of its investigation of medical errors reported that "65% of sentinel events and 90% of root cause analyses cited communication error as a contributor" (Coleman et al., 2006 p. 131). During the six-year period between 2004 and 2010, communication breakdowns were cited as the main cause of adverse events in the U.S. (TJC, 2011). Similarly, in an Australian study involving over 14,000 patient hospital admissions, 17% were associated with adverse events; of these, communication breakdown was causally linked to the adverse events in 70% of those cases (Riesenberg, Leitzsch, & Cunningham, 2010; Smeulers et al., 2014).

As a result of the findings of the landmark report, *To Err is Human: Building a Safer Health System* ( Kohn, Corrigan & Donaldson, 1999), and based on its own investigation of medical errors in the United States during 2004, The Joint Commission established safe communication at patient handoff as its National Patient Safety Goal for 2006 (JCAHO, 2011). In 2006, The Joint Commission also mandated the standardization of patient handoffs with the inclusion of a face-to-face, question-and-feedback component between nurses. At the time of implementation, this strategy was expected to improve information sharing and reduce errors (Breuer, Taicher, Turner, Cheifetz, & Rehder, 2015; Gephart, 2012). Following The Joint Commission's mandate to improve communication in 2003, with the addition in 2006 of specific recommendations to improve handoff communication, hospital leadership have implemented several initiatives targeting these goals. Despite the evidence, as well as gains made by hospitals in improving handoff communication, patient safety, and nurses' satisfaction over the last decade, jails have been slow to adopt these best handoff practices.

## Purpose of the Study

The purpose of this study was to improve the quality of the nurse-to-nurse handoff communication at a local jail by implementing structural and process changes to the existing handoff. To pursue this objective, the project was informed by current best practices for handoffs, as mandated by The Joint Commission. The Joint Commission recommends a nurse-to-nurse handoff that is standardized, which utilizes a face-to-face interactive process between nurses with the opportunity for fielding questions and receiving feedback (TJC, 2006; TJC, 2013; Welch et al., 2010; Zou & Zhang, 2016). To increase information retention, current best handoff practice also supports a reporting format comprising both verbal and written content. In situations in which the nurse-to-nurse handoff is delivered in an environment with non-electronic health records, best practice supports the use of a written report comprising a single-paginated design in the form of a checklist, which also includes certain minimum data sets. These best handoff practice recommendations served as an important resource for informing this practice improvement project.

## CHAPTER 2: LITERATURE REVIEW

An effective patient handoff from an outgoing nurse to an incoming nurse is crucial to patient safety and continuity of patient care (Arora et al., 2008). An inefficient handoff is one that leads to patient care errors, redundancy, and the search for and need to reconstruct missing information. Together these result in lower nurse and patient satisfaction (Smeulers et al., 2014). The omission of clinically relevant patient information can potentially cause harm to patients by delaying diagnosis and treatment, contributing to redundancies in tests and diagnostics, preventing timely and accurate care, and increasing patient pain and suffering (Chaboyer et al., 2009; Zou & Zhang, 2016).

There is broad support in the healthcare literature for use of a standardized tool for handoff communication (Arora et al., 2008; Frietag & Carroll, 2011; Gephart, 2012). The purpose of handoff communication is to provide the incoming nurse with information that is clear, complete, and devoid of inaccuracies (TJC, 2012). Halm (2013) presents evidence that demonstrates the positive impact on patient care processes of standardizing change-of-shift and departmental handoff reports. Examples of positive impacts include significant improvements in clinical performance (as evidenced by improved communication); fewer technical errors; improved patient outcomes, such as reduced complications and patient satisfaction; and improved financial outcomes related to shorter handoff duration (Halm, 2013).

Standardization of the format and content of the patient handoff, with the inclusion of a face-to-face question and feedback component, has been widely found to offer the potential for

improving handoff quality and effectiveness (Gephart, 2012; Holly & Poletick, 2013; Klee et al., 2012; Zou & Zhang, 2016). Despite the acknowledged adverse consequences of ineffective handoffs, very little research has been conducted to establish best practice methods, nor has research directly linked practice changes to outcome improvements (Foster & Manser, 2012; Riesenberg et al., 2010). To inform the development of this quality improvement project, a systematic search of the literature was conducted to identify which nursing handoff styles were associated with improved handoff communication, patient care outcomes, and nursing care processes and outcomes.

To determine the best approach to improve handoffs at the clinical unit level, this project sought to answer four key clinical practice questions that are expressed in a PICOT format, in which the term, P = Population; I= Intervention, C = Comparator; O = Outcome, and T = Timeframe. Utilizing the PICOT format, the four clinical practice questions identified are:

1. Would a standardized patient handoff employing the SBAR I-5 Bundle in a local county jail be more effective than current practices in reducing handoff error rates?
2. Would nurses exhibit lower patient care error rates following application of the SBAR I-5 Bundle, compared to the pre-intervention practices?
3. Would standardization of the handoff protocol using the SBAR I-5 Bundle increase nurses' satisfaction compared to baseline?
4. Would standardization of the handoff protocol using the SBAR I-5 Bundle decrease the gap in nurses' perception of each other's performance in the handoff compared to baseline?

To investigate the possible impact of the SBAR I-5 Bundle adoption on handoff error rates, patient care error rates, nurses' satisfaction, and nurses' perception of each other's

performance in the handoff, a detailed search was conducted of two databases: PubMed (Public/Publisher MEDLINE) and CINAHL (Cumulative Index to Nursing and Allied Health Literature). The search included all English-language studies published between January 1, 2006, and January 31, 2016, which contained the following search terms: *report, nurse report, handoff, handover, end-of-shift report, nurse communication,* and *in-patients*. The inclusion criteria were original, hospital-based studies that investigated handoff structure, content, and style, including the evaluation of paper-based or electronic tools and their impact on the research endpoints. The reference lists of included studies and relevant reviews were screened for additional articles pertinent to the research question. Selected articles address the standardization of the handoff process, the incorporation of standardized tools in the handoff, and the impact of the standardization of the nursing process and structure on patient and nursing outcomes. Articles excluded were departmental reports, perspectives, editorials, opinions, posters, inter-facility transfer reports, and hospital discharges.

This study employed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guideline for identifying, screening, selecting, and including articles [See Diagram1, p. 66]. The quality of the research evidence used to guide this project was evaluated based on the American Association of Critical Care Nurses (AACCN) grading of evidence taxonomy [See Appendix A-10, p. 79].

The literature review identified current evidence of best handoff practices that served two purposes that guided this project. The literature review provided a practice standard against which the primary investigator evaluated current handoff practices at the jail. Secondly, the literature review provided guidance to the investigator in the selection of a best practice that complemented the goals of the project. The findings of the literature review are organized below

into four domains: Barriers/Facilitators to Effective Handoff; Handoff Structure and Process (standardized protocol, defined data set); Handoff Tools; and Critical Components to a Successful Handoff.

## Barriers/Facilitators to Effective Handoff

A "clinical handoff" refers to the passing of responsibility and accountability for patient care at care transition, from the off-going clinician to the in-coming clinician. The handoff involves the transfer of pertinent patient information to assure patient safety and care continuity (Cohen & Hilligoss, 2010). Poor clinical handoffs create discontinuities in patient care that are associated with patient harm (Jeffcott, Evans, Cameron, Chin & Ibrahim, 2009). Ineffective handoffs are associated with missed or delayed tests; unnecessary repeat tests and diagnostics; treatment delays; decreased patient and provider satisfaction; increased lengths of stay; and clinical complications (Jeffcott et al., 2009). Ineffective handoffs also contribute to information omissions and inaccuracies (Abraham, Kannampallil, & Patel, 2014; Goldsmith et al., 2010), and communication breakdowns related to language differences, experience, skills, status, and lack of training (Abraham et al., 2014).

Welsh et al. (2010) implemented a qualitative study to determine the barriers and facilitators to an effective handoff, using the tape-recorded and written method. The study consisted of a convenience sample of 20 nurses (RNs and LPNs) drawn from three clinical units (general internal medicine, acute care/oncology, and surgical ICU) at a Veterans Administration Medical Center. The report yielded six barriers to the handoff. The type and frequency with which respondents reported a given barrier are as follows: too little information (80%); too much information (50%); inconsistent quality of report (50%); limited opportunity to ask questions (35%); equipment malfunction (35%); and interruptions (20%). Welsh et al. (2010) also

identified specific structural and process elements that facilitated effective handoffs. These included: A report that delivers relevant patient-specific information of an appropriate amount, which also utilizes a formal, structured format with an opportunity for face-to-face interaction for fielding questions and receiving feedback.

Thomas and Donohue-Porter (2011) piloted a shift handoff involving eight of fifteen hospitals in a secular, non-profit healthcare system. Some problem-based triggers that had been identified by nurses and which fueled the change included: Inordinately long shift reports with discrepancies found between information handed-off and actual patient status; too many interruptions/disturbances during report; time constraints; poor support from colleagues; poor quality of leadership; and the paucity of information received (Thomas & Donohue-Porter, 2011).

A systematic review of the literature of patient handoffs by Riesenberg et al. (2010) highlights some specific causes of handoff communication failures and suggests potential solutions. According to Riesenberg at al. (2010), researchers exploring medical errors in the intensive care setting attributed 37 percent of patient care errors to verbal miscommunication between physicians and nurses. Similar research in an emergency department (ED) noted that all communication in that setting, including handoff communication, experienced a 31 percent interruption rate, which combined with multi-tasking, contributed to errors (Riesenberg et al., 2010). The researchers described these communications as “partial, cryptic, and haphazard” , whether in nurse-to-nurse or physician-to-nurse interactions, as (Riesenberg et al., 2010).

Variability in handoff procedures is another potential barrier to handoff communication that is causally linked to errors. Riesenberg et al. (2010) compared task-centered styles to patient-centered styles, and content-consistent formats to content-inconsistent formats. Low

recall rates (20-34%) were found with the task-centered, content-inconsistent format (Riesenberg et al., 2010). Similar research on handoff styles (written, verbal, or a combination thereof) found that the combination style yielded a 96% recall rate, compared to the inferior performance of exclusively verbal or written styles which yielded just a 0-58% recall rate (Riesenberg et al., 2010).

## Clinical Handoff: Structure and Process

Clinical handoff practices are recognized as essential to the effective transfer of patient information between nurses involved in end-of-shift handoff communication (Anderson, Malone, Shanahan, & Manning, 2014; Thomas & Donohue, 2012). Though the nurse-to-nurse handoff at shift change is pivotal to patient safety, continuity of care, and nurses' satisfaction, it remains an event that is highly vulnerable to errors for a number of reasons (Arora et al., 2008; Dayton & Henriksen, 2007; Thomas & Donohue, 2012). One prominent reason is the lack of standardized handoff tools (Abraham et al., 2014; Cairns et al., 2013; Jukkala, James & Autrey, 2012; Riesenberg et al., 2010; Staggers & Blaz, 2012).

Pothier et al. (2005) studied 12 simulated patients subjected to five consecutive handoffs using three different verbal reporting methods: verbal only; verbal and note-taking; and verbal and pre-printed form with essential clinical data. Wide variations were found in the amount of information retained across the three methods. "Verbal plus pre-printed sheet with clinical data" had the highest information retention, with the "verbal only" report having the least information retention. Researchers concluded that the case for the standardization of handoff data and tools was supported, and that reliance on "verbal reports only" should be eliminated. Furthermore, the combined format of "verbal report plus pre-printed sheet with clinical data" was found to be

crucial for enhancing clinician communication and improving patient safety at handoff (Pothier et al., 2005).

Argawal et al. (2012) evaluated the role of the handoff process on patient outcomes when pediatric patients were handed over from the operating room to a pediatric cardiac intensive care unit (PCICU). Researchers conducted a three-phase study, with Phase One evaluating the verbal handoff process typically utilized during transfer of pediatric patients to the PCICU after cardiac surgery. Phase Two of the study involved the use of a structured handoff process with multidisciplinary team involvement, that included an opportunity for asking questions and receiving feedback when pediatric patients were handed over to the PCICU team post-cardiac surgery. Phase Three of the study evaluated the structured handover process one year after implementation to assess for any loss of information during handoff and to evaluate the overall quality of the structured process (Argawal et al., 2012). Of 700 patients in the verbal handoff phase, there was a 24% complication rate, but just a 12% complication rate with the structured handoff process ($p < 0.001$). Data analysis from all three phases led researchers to conclude that a structured handoff process for the transfer of pediatric cardiac patients post- surgery was positively associated with a reduction in 24-hour complications, an improvement in information transfer at handoff, and an improvement in 24-hour patient outcomes (Argawal et al., 2012).

Cornell et al. (2014) researched the use of SBAR [Situation Background Assessment Recommendation] to improve nurse-to-nurse communication at handoff, across four medical-surgical units in a tertiary care hospital with seventy-five nurses involved in the study. The study employed a three-phase, pre-test/post-test design including a baseline pre-intervention phase; introduction of a paper-based SBAR intervention in the second phase; and an application of electronic SBAR intervention in the third phase. Using an observational approach, time spent on

report tasks was assessed as a percentage of the duration of the handoff report. The percent of time spent on report tasks at baseline was 54.6%, compared to 62.7% for the paper SBAR, and 66.4% using an electronic SBAR. These differences ($f = 3.67$, $p < 0.03$) indicated a statistically significant, favorable increase in shift report tasks using either SBAR interventions. The authors concluded that the standardized handoff process utilizing the SBAR tool facilitated a concise, structured, and standardized report that was far more patient-focused than previous approaches (Cornell et al., 2014).

Welsh et al. (2010) sought to determine the specific design features of the handoff report that enhance effective communication. The authors concluded that an effective handoff report must include essential structure and process design features. Structural features that must be addressed are the inclusion of sufficient, pertinent patient-focused content; written notes and space for notes; a structured form/checklist; and access to the electronic medical record (EMR) to locate missing information and validate information received in the report. In addition, the opportunity for face-to-face interaction between off-going and in-coming nurses is a key process component that must be included when designing an effective handoff protocol.

Based on these findings, Welsh et al. (2010) endorsed key structural and process features of an effective handoff. The handoff should include well-defined, unit-specific content, and a formal, structured end-of-shift report. Recommended process features were identified as embedding an opportunity for questions and answers, and an acknowledgement that the report is a three-phase process consisting of patient-specific information transfer, clarification and inquiry, and historical review (Welsh et al., 2010).

## Clinical Handoff:

**Tools** Following The Joint Commission's 2006 mandate that hospitals standardize the use of

handoffs at care transition, hospitals exerted considerable time and effort to achieve compliance. Abraham et al. (2014) found that the broad guidelines for handoff standardization led to wide variations in handoff tools. These variations were in part a reflection of the complexity of the healthcare system as well as the wide variances among clinical practice settings. Collectively, these factors spurred the adoption of a range of handoff tools by hospitals that complemented the various clinical settings.

Abraham et al. (2010) conducted a systematic review of the literature on handoff tools to investigate the adequacy and appropriateness of these in meeting standardization goals established by The Joint Commission. Handoff tool characteristics were classified using the following criteria: (a) paper or electronic tools; (b) EMR-integrated tools; and (c) tools specifically targeting nurses and physicians.

**Paper-Based Tools**

The key characteristics of paper-based tools that were found to enhance handoffs, included a single page design with tabular or checklist-based templates, which was organized according to data categories of patient demographics, reason for admission, medications, and nurse to-do lists (Abraham et al., 2014).

**EMR-Integrated Tools**

The increasing use of electronic medical record-integrated (EMR-integrated) tools by hospitals is driven on the one hand by federal mandate, and on the other by the availability of improved health information technology. Although these factors favor more universal use of EMR-integrated handoff tools by hospitals, transferability limitations imposed by clinic-specific design requirements severely constrain the universal adoption of EMR-integrated handoff tools in the hospital setting (Abraham et al., 2014).

Despite these limitations, Abraham et al. (2014) identified key features of EMR-integrated tools that have been found to enhance nurse-to-nurse handoff communication. These features include: The capability for automated download of handoff information; connectivity with other ancillary clinical information support systems; capability of automatic population of information in designated fields; safety flagging capabilities; and the capacity to support clinical handoff workflow (Abraham et al., 2014).

## Tools for Nurses and Physicians

Some researchers have concentrated on the design features of handoff tools that increase handoff quality from the perspective of the end-users, particularly nurses and physicians, who engage in handoff report at shift change. Of the articles addressing handoff tools to support end-users, 47% reported on tools for exclusive physician use; 34% examined tools specifically designed for nurses; and 20% examined nurse-physician handoff support tools (Abraham et al., 2014). The findings indicated that a significant percentage, 68 percent, of tools designed exclusively for physician-use were either EMR-integrated (42%) or electronic-based (24%), in comparison to tools for nurse-use, which were found to be 16% EMR-integrated handoff support tools, and 34% electronic-based handoff tools Abraham et al. (2014). However, no statistically significant association was found between the type of end-user (nurse or physician), and the type of tool (paper or electronic) which was most successful (Abraham et al., 2014).

Riesenberg et al. (2010) conducted a systematic review of 49 handoff tools which used mnemonics, including SBAR, IPASS THE BATON, and I-SHAPED. Of these, SBAR is the most widely utilized handoff report tool (Ashcraft & Owen, 2017; Riesenberg, Leitzsch, & Little, 2009; Starmer, 2012). Of the 46 articles examined by Riesenberg et al. (2009), 32 (69.6%) included SBAR. The SBAR tool, although originally developed by the military to solve

hierarchical communication barriers, was adapted by Kaiser Permanente of Colorado as a communication framework for conveying key information. The tool is now supported by The Joint Commission and the Institute for Healthcare Improvement (IHI) for use in healthcare facilities (Pope, Rodzen, & Spross, 2008; TJC, 2012).

## Handoff: Critical Success Factors

Standardized tools under various mnemonics have been credited with influencing communication improvements at handoffs; reducing handoff error rates; and improving patient safety and caregiver satisfaction. As a single, stand-alone intervention, mnemonics have not been shown to improve patient safety or bring about significant improvements in patient care outcomes. Rather, it has been shown that the combination of handoff standardization with education and training in communication and teamwork skills have together led to improvements in patient care outcomes (Beckett & Kipnis, 2009; Deering, Johnson & Colacchio, 2011; Grogan et al., 2004; Papaspyros et al., 2010). Beckett and Kipnis (2009) used the SBAR mnemonic augmented by communication education and a skills training component, to produce improvements in nurse-to-nurse communication; a reduction in handoff error rates; and improved nurses' satisfaction with communication at handoff.

Use of standardized tools and communication skills training as a strategy for improving patient safety and improved patient and caregiver outcomes was supported by research conducted by Starmer et al. (2014), which involved a prospective quasi-experimental intervention study of a physician improvement program. Outcome measures included a reduction in medical error rates, reduction of preventable miscommunications and adverse events, and improved physician workflow. The intervention included a seven-component I-PASS Bundle containing: The I-PASS standardized communication tool; a two-hour workshop in teamwork

and communication skills, as well as I-PASS handoff techniques; a one-hour simulation and role-playing session for practicing skills; a computer module to facilitate independent learning; a faculty development program; direct observation tools used by faculty to provide feedback to residents; and a process and culture change component (Starmer et al., 2014). Among 10,740 patient admissions, the post-intervention medical error rate decreased by 23%, and the preventable errors rate decreased by 30%. There was no significant statistically increase in handoff time, nor in resident workflow (Starmer et al., 2014).

In a different approach, Dingley et al. (2008) utilized a pre-test/post-test design to implement a standardized communication tool, the SBAR, for communicating changes in patient status over a 24-month period. The tool was implemented in conjunction with multi-disciplinary patient-centered rounds using a daily goals sheet, with team huddles during shifts at the medical intensive care (MICU) and acute care (ACU) units of the Denver Medical Center. The results of the study demonstrated that after the implementation of team/communication strategies: (a) communication time surrounding patient care issues was decreased; (b) nurses perceived increased satisfaction with communication; and (c) overall, higher rates of patient care issue resolution occurred (Dingley et al., 2008).

Smeulers and Vermeulen (2016) generated a blueprint for standardization of the handoff process utilizing a RAND-modified Delphi consensus process, and combined evidence from four systematic reviews of handoffs using nurses' expert opinions. This research sought to answer four key questions: "How to handover; what to handover; where to handover; and preconditions for handover" (Smeulers & Vermeulen, 2016, p. 3). This research generated three key recommendations that have universal application: First, the structured approach that combines verbal and written communication is most effective in minimizing information loss during

handoffs. Secondly, the incorporation of a safety-check to assign joint control to nurses involved in the handoff, and to create the opportunity for early detection of errors is critical for safeguarding patient safety. Thirdly, the appropriate preconditions for an effective handoff must include a quiet, interruption free environment, with adequate time for the handoff, and which is conducted by nurses who are adequately trained in the handoff process (Smeulers & Vermeulen, 2016). Smeulers and Vermeulen also caution that although standardization of the handoff is a necessary prerequisite for patient safety and continuity of care, any prescription for standardization must be adapted to the local context, given the wide variations in health care settings and clinical practice (Smeulers & Vermeulen, 2016).

**Summary of Tools: Best Practice**

The literature review identifies a number of key research findings that suggest key design features for a successful handoff protocol. The research identifies four essential components of a paper-based tool that constitute critical success factors. First is the standardization of the handoff along with an educational and training component in communication for nurses. A second key design feature is a paper-based handoff tool using a single pagination design organized in a tabular format, and including minimum data sets on patient demographics, admitting diagnosis, medical history, current treatment plan, to-do lists, and anticipated problems/issues. A third key design feature is a verbal face-to-face report, with opportunities for note-taking, obtaining clarification, and feedback. A fourth feature is an information verification check against the medical record to confirm the veracity of the communication, with an information transfer check to validate mutual, shared understanding by both nurses of the information exchanged at handoff.

Based on the evidence reviewed and presented above, these four design features provide the underpinnings which support the selection of the SBAR I-5 Handoff Bundle as the practice

intervention to decrease handoff and patient care error rates, increase nurses' satisfaction, and decrease the gap in nurses' perception of each other's performance in the handoff. The intervention will address the question: Will the implementation of the SBAR I-5 Handoff Bundle at a 22-bed acute care medical services unit of a jail improve the quality of the nurse-to-nurse communication at handoff, improve patient safety, increase nurses' satisfaction, and decrease the gap in nurses' perception of each other's performance in the handoff?

# CHAPTER 3: CONCEPTUAL FRAMEWORK

During the last several decades, interest in organizational performance has increased, and researchers, clinicians, and hospital managers have been tasked to improve patient care outcomes. Given strict austerity measures and increasingly lean operational budgets, managers are pursuing ways of improving organizational performance by optimizing the efficiencies of its existing resources. In so doing, managers have scrutinized the organizational structure-process-quality-outcome relationship to identify opportunities for quality improvement.

In selecting an appropriate theoretical framework to inform this evidence-based practice project, a thorough search was conducted to identify literature describing conceptual frameworks and empirical evidence associated with quality improvement. Theoretical frameworks in the behavioral, organizational, and health services research fields were examined. Of the many potential frameworks from these and other fields, the Donabedian quality framework was selected because it provided a basis for understanding both the inter-connectedness between the quality triad of structure-process-outcome [S-P-O], as well as how quality improvements can be accomplished by manipulating antecedent structure and process variables. Donabedian's S-P-O triad provides a good fit for this project because it is congruent with its conceptual underpinnings.

## Overview of Donabedian's Quality Framework

Avis Donabedian introduced the concept of quality to the healthcare industry in the mid-1960s, following the successful implementation of his quality improvement principles in the

manufacturing sector, especially in the automobile and aviation industries. Donabedian's quality improvement theory is based on a quality triad defined as *structure, process,* and *outcome* (Donabedian, 1966; McDonald, Sundaram, & Bravata, 2007). In measuring quality in the health sector, Donabedian posited that "outcomes are valid measures of quality only to the extent that they relate to the antecedent processes of care" (Donabedian, 1978). Donabedian (1988) developed the quality triad, a three-part approach of structure, process, and outcome, that he predicated on the premise that "good structure increases the likelihood of good process, and good process increases the likelihood of good outcome" (p. 1745).

## Structure in Donabedian's Quality Triad

Donabedian defined the structure of healthcare as the setting in which healthcare is delivered. He included the physical plant and equipment, personnel, as well as the operational and financial processes supporting medical care (Donabedian, 1988; Smitz, Naranjo & Viswanatha Kaimal, 2011; Sundaram et al., 2007). Donabedian's definition of structure includes organizational inputs such as staff organizations, methods of peer review, and methods of reimbursement; the human resources that make care possible including the number, experience, and qualifications of personnel; and the cultural aspects of the care setting (Donabedian, 1988). Utilizing the Donabedian conceptual framework, Hearld and Alexander (2008) extended the term "structure" to include organizational descriptors such as size, complexity, ownership status, staff skill-mix, and the level of technological sophistication used by the organization. Hearld and Alexander (2008) concluded that structure is a necessary, but not solely sufficient determinant of quality, and that deficits in organizational structure decrease the likelihood of quality outcomes.

## Process in Donabedian's Quality Triad

In Donabedian's quality framework, "process" represents the second dimension and refers to all activities performed "to improve patient health in terms of promoting recovery, functional restoration, survival and even patient satisfaction" (Donabedian, 1966; Smitz Naranjo & Viswanatha Kaimal, 2011; Sundaram et al., 2007). According to Donabedian, "process refers to what is actually done in giving and receiving care" (Donabedian 1980, p. 1745). The process component of Donabedian's quality triad offers the greatest opportunity for using change to impact the outcomes congruent with the study goals. As applied to this project, the process elements targeted for intervention include the standardization of the reporting style; verification of the accuracy and comprehensiveness of the report content; and validation of mutual understanding of the information transferred by both nurses involved in the communication exchange at handoff. Given the causal relationship between process and outcome, as conceptualized in Donabedian's quality framework, it is predicted that the manipulation of the structure and process variables will create a measureable impact on outcomes (Donabedian, 1966, 1978, 1988).

## Outcome in Donabedian's Quality Triad

Health outcomes are the result of the medical care (e.g., medical and nursing processes) delivered to the patient, as well as the patient's underlying health characteristics (Sundaram et al., 2007). Donabedian's quality framework stresses the inter-connectedness of elements of the S-P-O Triad. According to Donabedian (1966, 1978) the interplay of structure and process are key determinants of outcomes. As applied to this project, changes in structure such as nurse training, and use of a standardized handoff tool with prescribed minimum data sets, when these are combined with process changes, lead to changes in quality outcomes. For example, the

information verification, and validation of mutual shared understanding checks will predictably impact outcomes, when performed jointly by both nurses involved in the handoff. Donabedian's S-P-O Quality Triad as applied to this project is represented schematically in Diagram 2 [See p. 67].

Based on Donabedian's triad, the first objective of the current study was to effect structural changes in the format and content of the nurse-to-nurse, end of shift handoff, through standardization of communication using the SBAR I-5 Handoff Tool. The second objective was to develop process changes by including an information verification and validation component, which could be executed jointly by both nurses engaged in the end-of-shift nurse-to-nurse handoff. The operationalization of the structural and the process objectives will improve outcomes in two ways. First, the verification feature embedded in the study tool will improve the technical aspects of communication, that is, the veracity and comprehensiveness of information exchanged at handoff. Secondly, the validation feature of the selected study tool assures mutual understanding of information exchanged between nurses at handoff. According to Donabedian, these structure and process changes will improve outcomes. Applied to this project, the intervention is expected to improve the outcome measures, quality of the handoff communication, increase patient safety, increase nurses' satisfaction, and decrease the gap in nurses' perception of each other's performance in the handoff.

# CHAPTER 4: METHODOLOGY

This quality improvement project evaluated the effectiveness of the SBAR I-5 Handoff Bundle in improving the quality of the nurse-to-nurse handoff communication at a local county jail in North Carolina. This study employed a mixed methods design using a pre/post-intervention questionnaire, observations, interviews, and retrospective review of patient' medical charts. The study was approved by the Institutional Review Board of the University of North Carolina at Chapel Hill (UNC-CH IRB) in February 2017 (IRB 16-3396), following agency approval by the Medical Director of the Wake County Jail. The study was implemented from February 2017 through March 2017.

## Setting

This study was conducted in an in-patient, 22-bed acute care medical services unit of a local county jail. This unit consists of a mix of single occupancy jail cells and larger, shared occupancy dorm units; each houses up to four occupants. The study unit had 22 staffed beds, with an average daily census of 14 patients (65% occupancy). Lengths of stay average eight days, with a mean patient-to-nurse ratio of 14:1. Patients are typically admitted to the unit through the intake screening process: Through assessments conducted after emergency interventions in the general housing units; by medical providers during clinic assessments; and after transfer from inmates' general housing units following deterioration of an inmate's health status.

The clinical care needs of patients assigned to this unit are delivered by the nurse assigned to cover the 12-hour shift; patients have diverse healthcare needs covering a range of chronic health conditions (for example, diabetes, hypertension, and chronic kidney disease), acute health care needs (including gunshot wounds, stab wounds, and post-surgical care), and mental health conditions such as bipolar disorder and schizophrenia. The unit is staffed 24 hours a day by nurses working two twelve-hour shifts (either 7:00 AM.-7:00 PM, or 7:00 PM.-7:00 AM), with one nurse assigned to each 12-hour shift.

## Subjects

Potential study participants included 46 nurses employed by the Medical Department of the Wake County Jail. Study participants were men or women, 18 years or older, who possessed an active NC nursing license, and who then practiced nursing at the Medical Department of the Wake County Jail. Exclusion criteria include non-nursing personnel employed in the Medical Department of the Wake County jail, patients, and visitors.

## Outcome Measures

This study targeted four main outcomes: Improvements in the quality of the handoff; improved patient safety; increased nurses' satisfaction; and a decrease in the gap in nurses' perception of each other's performance in the handoff. In research, tools are often used to measure the outcomes targeted. This study employed The Handover Evaluation Scale Survey (HES) to measure nurses' satisfaction with the handover process, and the Manser Handover Quality Rating Tool to measure the quality of the Handover.

### The Handover Evaluation Scale

The HES is a valid and reliable tool developed by O'Connell, Ockerby & Hawkins (2012), using exploratory and confirmatory factor analysis. The HES comprises three subscales:

Information quality; Interaction and support; and Efficiency. Each subscale is further broken down into subscales as follows: Information quality comprising six subscales; Interaction and support comprising five subscales; and Efficiency comprising three subscales.

With the authors' permission, this study utilized an 11-item adapted HES tool with subscales in each of the three factors distributed as follows: For the Quality of Information scale, five subscales were selected; for the Interaction and Support scale, three subscales were selected; and for the Efficiency scale, two subscales were selected. Each subscale of the HES was evaluated on a 7-point Likert scale ranging from 1 (strongly disagree) and increasing positively to 7 (strongly agree). Using the 11-item adapted HES tool, the primary investigator evaluated and rated each nurse-to-nurse handoff observed. For each handoff observed and rated, the individual score of each dimension was summed to produce an overall global score for each handoff. This procedure was done at pre-intervention and repeated at post-intervention.

**Manser Handover Quality Rating Tool**

The quality of the nurse-to-nurse handoff was measured using the Quality Rating Tool developed by Manser. This Quality Rating Tool has 14-items that measures four dimensions of a quality handover as defined by the author. These include: (a) the conduct of the handover; (b) nurse teamwork; (c) handover quality; and (d) circumstances of the handover. Each of these 4 dimensions is further divided into subscales which are each rated on a 4-point Likert scale, with 1 indicating the full expression of the variables and 4 indicating the absence of the variable. [See Appendix A-5, p. 74]. All written documentation associated with each handoff observed were assessed and scored by the primary investigator using the document-specific subscales of the Rating Tool. The scores for each subscale were summed to generate a comprehensive score for

each handoff observed. The same procedure was performed at pre-intervention, and repeated at post-intervention.

## Survey Recruitment

Nurses were recruited for the study through an initial on-line Participant Letter of Invitation circulated to all nurses employed in the Medical Department of the Wake County Jail through the Medical Department's intra-net. This initial contact was followed up with a face-to-face educational presentation during the nurses' monthly meeting. Also, during this meeting the primary investigator presented a basic outline of the study, a description of the project implementation phases, expectations of participants, protections offered to participants, and the benefits of participation at both a personal and institutional level.

## Data Collection Methods and Process

Four types of data collection methods were employed by this study: Surveys; observations; semi-structured interviews; and retrospective patient chart reviews. Data were collected at baseline (pre-intervention) using the four data collection methods identified. Following implementation of the intervention, data were again collected using the data collection methods employed at baseline.

### Pre-Intervention/Post-Intervention Survey Questionnaires

The 11-item adapted Handover Evaluation Scale (HES), the tool used to evaluate nurses' satisfaction with the handover quality at baseline (pre-intervention phase), was repeated post-intervention [See Appendix A-6, p. 75]. This tool was initially administered to nurses in the form of a self-administered, written questionnaire, referred to as the pre-intervention survey, to collect baseline data on the handover quality. The identical 11-item adapted Handover Evaluation Scale survey was redistributed in the post-intervention phase as the post-intervention survey. Nurses

were asked to affix their personal self-coded identifier to the pre-intervention and post-intervention questionnaires to facilitate pairing of responses in the analysis phase, as well as for blinding of the study. Completed responses to the pre-intervention and post-intervention surveys were collected within 48 hours of distribution.

Of the eight nurses assigned to the study unit for the duration of the study, only seven provided informed consent to participate. A total of 18 nurses, including the seven at the study unit, completed the post-intervention survey. Seven of the 11 nurses who completed the post-intervention survey were not exposed to the study intervention. The survey responses of these seven nurses were paired through matching, and were used as a control group for the study.

**Observations**

The primary investigator collected data from nurses identified in the sample using the observation method. Prior to the introduction of the study intervention, three randomly selected end-of-shift handoffs were observed by the primary investigator and evaluated on three dimensions: Conduct of the handover; teamwork; and handover quality, using the 10-item adapted Manser Handover Quality Rating Tool.

Each pair of nurses observed in the pre-intervention phase was labeled: Nurse pair #1 pre-intervention, Nurse pair #2 pre-intervention, and Nurse pair #3 pre-intervention. The tool was repeated in the post-intervention phase of the study to three nurse pairs. As far as possible every effort was made to preserve the same nurse pairs in the post-intervention phase to facilitate comparison of paired responses to evaluate the effect of the intervention. In two of the three cases, the same nurse pairs were maintained based on scheduled assignments. In one case, one member of the original pre-intervention nurse pair was on vacation so another nurse completed the third post-intervention observation pair.

## Nurses' Interviews

The Interview method constituted the third means by which data were collected during this study. The primary investigator interviewed nurses who participated in end-of-shift handoffs at the 22-bed acute care medical services study unit at the pre-intervention phase of the study. Interviews were conducted using a combination of a 5-item questionnaire developed by the investigator, and spin-off questions generated from interviewees' responses. Repeat interviews were conducted by the primary investigator during the post-intervention period. Pre-intervention nurse interview responses were coded to facilitate pairing with responses obtained from the same nurses during the post-intervention phase. Questions addressed during the pre-intervention interview with nurses covered structural and process issues involved with the handoff, as well as their perceptions of changes in study outcomes noted following implementation of the study intervention, the SBAR I-5 Handoff Bundle [See Appendix A-9, p. 78].

### Nurses Perception of their Own Communication in the Handoff

To fully understand and to resolve communication deficiencies with the nurse-to-nurse handoff, the primary investigator sought answers to the fourth project question: Firstly, how do individual nurses involved in the nurse-to-nurse handoff perceive the quality of their own communication exchange at handoff? Are there differences in the way each nurse in the handoff pair perceives the quality of the other nurse's communication in the handoff? And, if differences exist, how are these likely to contribute to communication failures at handoff?

To do this, the investigator utilized a 4-item adapted Handover Evaluation Scale survey by modifying the questions based on whether the in-coming or off-going nurse was being targeted. The construction of the 4-item adapted HES survey is captured in Table 1 [See p. 57]. The results of the 4-item adapted HES survey for each nurse pair (in-coming nurse and off-going

nurse) were analyzed to identify differences in perceptions of the quality of the information exchanged at handoff between the sender of the message (the off-going nurse) and the receiver of the message (the in-coming nurse)

Nurse responses to the 4-item HES survey were based on a 7-point Likert scale ranging from 1 (strongly disagree) and increasing positively to 7 (strongly agree) similar to that utilized in the 11-item adapted HES survey. This 4-item adapted HES survey was distributed to paired nurses at baseline and repeated post-SBAR I-5 Handoff Bundle study intervention.

**Confidentiality of Participant's Identity**

Patients' and nurse participants' data were protected throughout the conduct of this study. In the case of jail patients, "booking numbers" were used as identifiers to retrieve and file patients' medical charts.

**Anonymity of Data**

Surveys of nurse participants did not request personal identifying information that would expose the identity of respondents. Instead, participants were encouraged to affix their self-generated coded identifier to all survey responses associated with this study.

**Conflict of Interest**

There were no conflicts of interest identified or disclosed in this study.

**Project Monitoring & Response to Intervention Challenges**

Project implementation was monitored throughout the course of implementation by the primary investigator. On a weekly basis, the investigator accompanied nurse teams engaged in the handoff during their walking rounds. The investigator used these opportunities for data collection, to identify potential barriers and threats to the study, to gauge nurse participation in

the study, and to address nurse participants' concerns in a timely manner. Monitoring was also performed through random retrospective patients' medical chart reviews.

**Data Analysis: Quantitative Analysis**

Demographic data were collected on several variables of the population and study sample including: Age; highest level of education, shift worked; gender, nursing experience, other language spoken besides English. Descriptive statistics were used to describe the population and study sample.

Pre-intervention/post-intervention questionnaire data were compared to determine differences in outcome over time. The small sample size (n=6) precluded the application of SPSS statistical testing as well as independent sample t-test or paired t-test statistics to determine statistical significance of group differences because these would yield no meaningful results. Instead, descriptive statistics for pre-intervention and post-intervention data were presented for each study outcome, with a qualitative interpretation of those findings and the conclusions drawn.

Responses to the self-administered written 11-item adapted HES survey questionnaires completed by nurses during the pre-intervention and the post-intervention phases were examined. The individual responses to each question of the 11-item pre-intervention HES survey questionnaire were summed, and a mean score generated for each individual survey question. This process was repeated at the post-intervention phase. Pairing of pre and post-intervention surveys were done by matching the responses using the coded identifier affixed to each nurse's pre-intervention and post-intervention HES survey responses. The 10-item adapted Manser Handover Quality Rating Tool was used to evaluate the quality of the nurse-to-nurse handoff at baseline, and was repeated post-implementation.

Handoff error rates and patient care error rates were computed from data extracted from random retrospective patient chart reviews at the pre-intervention and post-intervention phases to facilitate comparative analysis and to inform conclusions drawn. For purposes of this study, a handoff error was defined as any miscommunication between the nurses at handoff whether through wrong information communicated by the off-going nurse (Misinformation); misinterpretation of information received by the incoming nurse (Misunderstanding); or failure of the off-going nurse to communicate pertinent patient information to the in-coming nurse (Omission). A patient care error is defined as missed, deficient, and/or delayed care received by the patient as a direct result of miscommunication between nurses at handoff.

**Data Analysis: Qualitative Analysis**

Qualitative data included recorded notes from nurse observations and nurses' semi-structured interviews, as documented by the primary investigator. During observations, the primary investigator recorded notes on nurses' use of the SBAR I-5 Tool, nurse to nurse interaction during the handoff (including tension or ease of engagement at start of the shift), and whether any leadership patterns emerged during the handoff.

Content analysis of the responses of interviews conducted with nurses was performed. Nurse responses were grouped into categories reflecting themes related to nurses' inter-shift team dynamics and communication. Additional sub-themes were developed for each category.

# CHAPTER 5: RESULTS

## Introduction

This study sought answers to four clinical questions. First: Following implementation of the SBAR I-5 Handoff Bundle, would there be improvements in the quality of the nurse-to-nurse handoff communication. Secondly: Would there be improvements in patient safety? Thirdly: Would nurses' satisfaction increase post implementation of the SBAR I-5 Handoff Bundle? And, fourthly: Would the gaps in nurses' perception of each other's performance in the handoff diminish following introduction of the SBAR I-5 Handoff intervention? The analysis was informed by quantitative and qualitative methods which are presented below.

## Quantitative Analysis

Of a possible 46 nurses, seven participated in the SBAR I-5 intervention. There were 33 completed pre-intervention surveys (72%), and 18 (33%) completed post-intervention surveys. This significant drop in the post-intervention response rate was predictable since nurses who were not exposed to the study intervention were less inclined to complete the post-intervention survey.

Of the 18 nurses who responded to the post-intervention survey, seven were included in the study sample. The study sample comprised a convenience sample of nurses working at the study unit during the period of the study, and who consented to participate and actually utilized the SBAR I-5 Handoff Tool during nurse-to-nurse handoffs. Of the seven nurses in the study sample, six pre/post-intervention surveys were successfully matched and paired.

Results of the quantitative analysis of each outcome measure: the adapted 11-item Handover Evaluation Scale; Manser 10-item adapted Handover Quality Rating Tool; and Manser 4-item adapted Handover Quality Rating Tool are presented and discussed in relation to each study question addressed below.

## Descriptive Statistics: Population

Demographic information was collected on seven variables: Years of nursing; highest academic degree earned; current position; employment status; shift worked; gender; and languages spoken other than English. Participants' nursing experiences ranged from two to 39 years with 39% of participants having more than 16 years nursing experience, and with 35% having 6-10 years of nursing experience. Nurse participants with less than 5 years and between 11-15 years of nursing experience were equally distributed at 13% each. The gender distribution was heavily skewed to females at 85% (39 of 46 nurses), with males at 15% (7 of 46 nurses).

Regarding nurses' education, the highest degree earned was reported at the Masters level (0.6%). The Associate in Science degree in nursing was most frequent at 65% (30 of 46); 34% (16 of 46) of nurses possess a Baccalaureate in Nursing degree. The nursing structure at the Wake County Jail is relatively flat with no clinical ladder in place. This is reflected in the composition of nurse positions in the study population comprising just one supervisor (2.2%), and with 45 nurses (97.8%) designated as staff nurses. The majority of nurses (37 of 46) at the jail have full-time employment status (80.4%), with two part-time nurses (4.3%), and seven nurses filling vacant shifts on an as needed basis (PRN) comprising 15.2%. Twenty-seven of the 46 nurses (59%) work during the day (7AM-7PM), with the remaining 19 nurses (41%) assigned to the night shift (7PM-7AM).

Fifty-seven percent of nurses employed by the jail were born in a foreign country, and 55% of nurses employed at the jail speak a native language other than English. A summary of the descriptive statistics of the study population is shown [See Table 2, p. 58].

**Descriptive Statistics: Study Sample**

The demographics of the study sample closely paralleled that of the Wake County Detention Center jail nurses' population with the exception of gender with no males included in the study sample. The absence of a male in the study sample was purely due to chance. Nursing experiences among study participants ranged from 2 to 34 years with the experiences distributed as follows: Two nurses (33%) had practiced nursing between 6-10 years and two other nurses had more than 16 years nursing experience. The categories of less than 5 years and 11-15 years of nursing experience each had one nurse which represented 16.7% of the sample. Of these nurses, one nurse (16.7%) had attained the Baccalaureate degree in Nursing, and 5 of the 6 nurses (83.3%) attained the Associate degree level. Regarding employment status, 5 nurses (83.3%) have full-time employment, with one nurse (16.7%) employed part-time. Two-thirds (4 of 6, or 66.7%) of the study sample nurses work the day shift (7A-7P), with the remaining one-third of the study participants working the night shift (7P-7A). Comparative descriptive statistics of the population and study sample are shown [See Table 4, p. 60].

**Qualitative Analysis**

The recorded notes from the primary investigator's observations of nurses' handoffs and semi-structured interviews were analyzed using Corbin's grounded theory methods. Two overarching themes for SBAR I-5 effectiveness that emerged were: 'Improved Communication" and "Improved Inter-nurse Dynamics." Study participants cited specific structural and process features of the newly implemented SBAR I-5 tool that contributed to improved communication.

These included the predictable, standardized format of the report comprising: The mandatory inclusion of specific patient data sets; the incorporation of the SBAR I-5 script during patient rounding at handoff; and the inclusion of the information verification and validation steps. Study participants also endorsed feelings of greater connectedness through the close collaboration fostered by the new SBAR I-5 Tool that requires both handoff nurses to co-jointly confirm the handoff report, and to validate mutual understanding of the information shared.

## Results of Study Questions

### Results of Study Question #1: Would nurses' satisfaction with the Handoff improve post SBAR I-5 implementation?

The results of the completed pre-intervention and post-intervention survey questionnaires were compared to determine whether there was a change in the nurses' satisfaction with the quality of the handoff following the study intervention, the SBAR I-5 Handoff Bundle. Survey responses from nurse participants in the study sample reflected improvements in all 11 HES questions surveyed in the post-intervention phase [See Table 5, p. 40].

These results demonstrate that some of the key contributors to nurses' satisfaction with the quality of the handoff in this study were the quality of the information exchanged; interaction and support; and the efficiency of the handoff. Overall, the effect size between the pre-intervention and post-intervention phases was +1.6 indicating that nurses' perception had a modest improvement following the SBAR I-5 Handoff intervention. However, considering the absolute change in nurses' perception, nurses' perception of the handoff was 5.7 on a 7 point Likert scale, which indicates a more than average increase following the intervention.

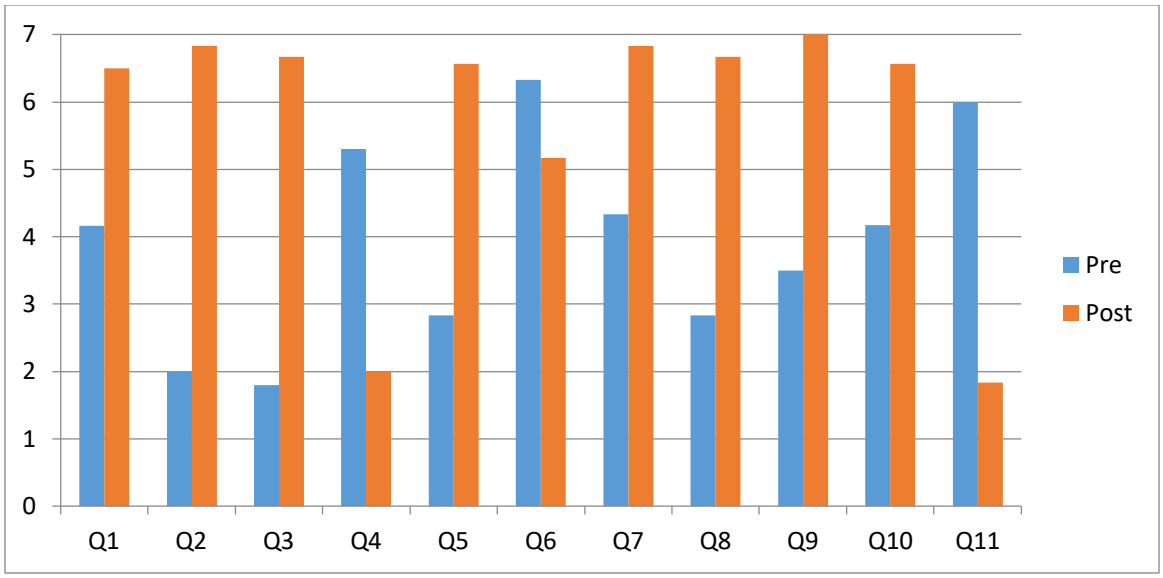



**Table 5**: Comparison of Nurses' Satisfaction: Pre and Post SBAR I-5 Implementation Paired Study Sample Results (n=6)

Of the improvements noted, the largest increases were recorded for the questions shown [See Appendix B-2, p. 81].

Pre-test/post-test differences in survey responses in the study sample were also compared to pre-test/post-test differences in the control group to determine whether differences in the outcome were attributable to the study intervention. Results are shown [See Appendix B-3, p. 82].

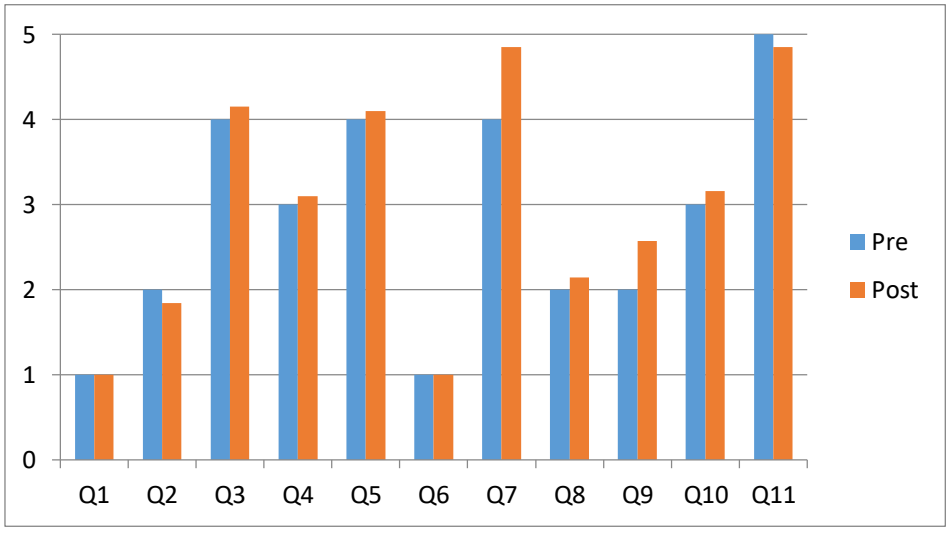



**Table 6**: Comparison of Nurses' Satisfaction: Pre- and Post-SBAR I-5 Implementation in the Control Group (n=6)

Marginal differences in the pre/post test results in the control group are noted. Nurses in the control group were not exposed to the study intervention so the marginal differences shown are purely due to chance or a poor response recall by the nurses completing the post-intervention survey. Compared to the study sample, significant differences in the pre/post-test responses were noted, and are positively associated with exposure to the SBAR I-5 study intervention.

**Results of Study Question #2: Would nurses' perception of the quality of the Handoff improve post SBAR I-5 Implementation?**

The quality of the nurse-to-nurse handoff communication was measured using the results of three data sets:(1) Observations of nurse-to-nurse interactions, report content, and style at handoff as documented by the primary investigator using the 10-item adapted Manser Handover Quality Rating Tool [See Appendix B-4, p. 83]:(2) content analysis of anecdotal nurses 'responses to' semi-structured interviews; and (3) nurses' handoff error and "error-capture" rates computed post-implementation of the SBAR I-5 Handoff Bundle.

The following is a summary of comments from nurses' interviews that reflect nurses' improved perception of the quality of the handoff communication post-SBAR I-5 Implementation. These comments also served to clarify the four formal communication themes identified: Improved communication; improved information transfer; improved confidence; and improved patient safety.

**Study Question #2, Theme One: Improved Communication**

RN1: Stated that "the handoff report follows a more predictable, organized structure that makes it a whole lot easier to follow."

RN2: Described her experience with the new report structure as, "more organized; more consistent."

RN3: Stated that, “the report is now structured; it follows a logical format.”

RN4: Stated that, “everyone is now using the same format; I feel like we are on the same page, and that helps a lot!”

**Study Question #2, Theme Two: Improved Information Transfer**

RN1: One nurse stated that the report was more comprehensive. She commented specifically that, “Now I know more than just why the patient is here; I have information on the patient’s history- medical, mental, surgery. I now have a context and can take better care of the patient.”

RN2: “Before this SBAR, I wasn’t sure I was getting everything; now, if I don’t get something, I just have to look at the form and I know what is missing, and I ask for it.”

RN3: “I like the new form (SBAR I-5 tool) and the check off of orders at the end. If there is a problem, we usually catch it here and take care of it. Now I don’t have to waste time looking for information that wasn’t passed on.”

**Study Question #2, Theme Three: Improved confidence**

Care continuity: One nurse spoke of the benefit of validating all orders at handoff. She commented specifically that, “by checking all orders with the off-going nurse, this gives me greater confidence that my information is up to date, increases my confidence to continue the patient’s care, and at least, I don’t have to waste time looking for missing information after the nurse has gone.”

Anticipatory guidance: One nurse commented: “Thanks for this new system (SBAR I-5), I now get a heads up of patients that are really very sick; who to watch out for; and what to do if they are going bad.” I feel greater connectedness between nurses; I feel more accountable for the care I give.”

Prioritization of Patient Care: One nurse shared her experience as follows: "Good thing, the nurse gave me a heads up! So I changed things a little, I started with the sickest patient first. And guess what, the patient was actively vomiting when I got there. I gave him a shot and kept my eyes on him for the rest of the night."

Another nurse related that she was forewarned about a patient's seizure history, "and sure enough, the patient had a seizure that night; we ended up sending him out (to the hospital)."

**Study Question #2, Theme Four: Improved Patient Safety**

Reducing errors: One nurse commented that, "since we started checking orders during handoff, we discover errors sooner, and before they can get to the patient to cause harm. This makes patient care safer." Another off-going nurse said, "today was extremely busy for me with a lot of distractions and I forgot to give the patient his pain med at 6 o'clock (6 PM dose). But thanks for the handoff check, the error was identified and I was able to correct it promptly." In response to this incident, the in-coming nurse commented, "I'm happy that we found the error and corrected it; otherwise I would have an angry patient on my hand, and would have to waste a lot of time trying to find out whether the patient received his dose or not. This is not the way that you want to start your shift."

One of the measures used to evaluate the quality of the handoff was the handoff error rate. Compared to the pre-intervention phase, the handoff error rate post-SBAR I-5 Handoff implementation increased slightly (20.4% vs. 12.2%). Even with this slight increase, there was a distinct reduction in handoff errors reaching the patient (increased error capture) to cause harm due to the information verification check introduced by the study intervention.

The third measure of handoff quality employed by this study was the Handover Quality Rating Tool by Manser. Results of the 10-item adapted Manser Handover Quality Rating Tool

used by the investigator to rate the quality of nurses' handoffs at baseline and repeated post SBAR I-5 intervention [See Appendix B1, p. 80] show improvements in all quality variables measured by the tool. However, the greatest improvements in quality occurred in relation to the logical structure of the handoff; the use of the SBAR I-5 handoff tool to structure the handoff report; greater effectiveness in setting patient care priorities; the clarity and completeness of the communication exchange; and the resolution of ambiguities. These areas of greatest improvements are congruent with anecdotal comments shared by nurse participants during the semi-structured nurses' interviews.

**Results of Study Question #3: Would Patient Safety increase post SBAR I-5 Implementation?**

Patient safety was measured by the patient care error rate, which was computed as the number of patient care errors per medical chart. Seven patient medical charts were reviewed for quality care during the pre-intervention phase, and seven were reviewed for quality patient care during the post-intervention phase. The patient care error rate was computed as the number of incorrectly processed medical orders that adversely impacted the patient's care (hits) or had the potential to negatively impact the patient's care (near misses). It is to be noted that the patient care error rate post-intervention (10%) was a 10-fold reduction compared to the patient care error rate pre-intervention (100%). This significant reduction was attributable to the verification check introduced by the study intervention, in which both nurses engaged in the handoff jointly corroborate all orders received during the shift with the patient's medical record at handoff prior to ending the shift.

During the nurse-to-nurse handoff verification step, handoff errors were intercepted at the handoff interface between the in-coming and off-going nurses before the error reached the

patient. This verification check performed by both nurses using the patient's medical chart, constitutes part of the quality intervention embedded in the SBAR I-5 Handoff that was implemented to reduce patient care error rates and improve patient safety. During the pre-intervention phase, prior to the implementation of the study intervention, there was no verification step. Consequently the handoff errors actually reached the patient and negatively impacted the quality of care the patient received. The patient care errors at pre- and post-intervention phases of the study are captured in Table 11 [see p. 65]. Nurses also reported improved patient safety post SBAR I-5 implementation during nurses' semi-structured interviews.

**Results of Study Question #4: Would the SBAR I-5 Handoff intervention close the gap in nurses' perceptions of each other's performance in the communication exchange at handoff?**

The results of this survey are reported in Table 7 (Baseline In-coming Nurse Perception); Table 8 (Baseline Off-going Nurse Perception); Table 9 (Baseline Combined Responses of In-coming and Off-going Nurses); and Table 10 (Combined Nurse Responses Post-Intervention). Overall, the survey responses indicated a significant gap between the off-going nurses' perception of their own performance in the handoff compared to how their performance was ranked by the recipient of their communication, the in-coming nurses at baseline. Following the implementation of the I-5 validation check introduced by the study intervention, the gap in nurses' perceptions of each other's performance was severely reduced.

This gap in the in-coming and off-going nurses' perception of each other's communication in the handoff exchange creates significant risks for misunderstanding, and creates opportunities for dissatisfaction with the communication exchange at handoff. The

inclusion of an information validation step in the handoff protocol, the I-5 Tool, serves the important function of decreasing the risk of misunderstanding and decreasing nurse dissatisfaction with the handoff by assuring that both nurses in the handoff have a mutual, shared understanding of the information exchanged. An important added benefit of this validation step is that patient safety is also improved.

Besides, the specific study questions that were answered, there were additional benefits of the SBAR I-5 study intervention noted. One benefit was reflected in improved nurse-team dynamics at handoff that was evident during investigator observations of nurses at handoff.

**Improved Inter-Nurse Dynamics during the Nurse-to-Nurse Handoff**

Leadership: The primary investigator conducted observations over seven randomly selected handoffs, four of which were conducted on the night shift, and the remaining three on the day shift. Although nurses reported that no hierarchical structure existed within the nurse teams at handoff, some evidence of a hierarchical structure became evident during researcher observations. This hierarchy appears to have developed from each nurse's perception of the other nurse's "trustworthiness," defined as a combination of clinical competence, experience working with patients in the unit, clinical judgment, and history of the quality of anticipatory guidance given in previous handoffs. Given these factors, the investigator witnessed handoffs where the dominant role shifted from the in-coming to the off-going nurse based on the perceived "trustworthiness" of the participants. In two teams, the structure appeared to be flat (non-hierarchical) and was positively associated with two factors: (1) Relative newness of both nurses to the unit and (2) Social relationships between nurses beyond the work setting.

Nurses' Newness to the Unit: In this case, the team consisted of two nurses, one of which had been newly oriented to the unit, and the other who had been temporarily assigned to

the unit to fill a vacancy created by the absence of the regularly schedule nurse. In both situations, the nurses were relatively "new" to the unit and the interactions between these two nurses followed a non-hierarchical pattern.

Social Relationships Outside of the Work Setting: From observations, the interactions between both nurses during the handoff assumed a non-dominant, non-hierarchical structure. Feedback from interviews conducted with these nurses revealed that this nurse team had strong social relationship ties beyond the work setting. Perhaps, this team had developed high perceived "trustworthiness" in the external social arena that has transferred to the work setting.

Interpersonal Interaction: Nurse Teams were observed for relationship patterns based on the evidence of tension between participants, and the ease of establishing rapport early in the handoff interface. The teams that were "new" to the unit or had strong, non-job related, social relationships were devoid of tension and established rapport quickly. Some tension was observed with one team based on a "late arrival" by the in-coming nurse for the shift change. Upon interview, the nurse revealed two reasons for the observed tension and delayed engagement. First, late nurse arrival for the handoff causes a late start and late ending of the report. The latter has negative repercussions for her social responsibilities after work. The lack of compensation for shift extensions due to late starts was cited as another dis-satisfier.

Of note, following representation and management agreement to compensate nurses for time over-runs associated with this study, less tension at handoff was exhibited by the nurse involved in subsequent nurse-to-nurse interactions witnessed. Late arrivals for shift change were also corrected, and this improvement was also positively associated with diminished tension at nurse-to-nurse interface [See Diagram 3, p. 68] represents the new handoff process at the jail following the implementation of the SBAR I-5 Bundle introduced by this project.

## Study Strengths and Limitations

### Strengths

A possible strength of the project included the use of valid and reliable study tools, specifically O'Connell's Handover Evaluation Scale and Manser Handover Quality Rating Tool. This project also received excellent support from the Wake County Medical Department leadership which was fueled by their interest in establishing a foundation for driving other department-wide quality initiatives. This study demonstrated that the SBAR Tool used jointly with the I-5 validation tool can effect significant improvements in patient safety outcomes, staff communication, staff collaboration, and cohesiveness.

Transforming nurse-to-nurse communication processes at handoff was initially disruptive, yet nurses were able to abandon their comfort zones and successfully embrace and adopt a new communication process. This study demonstrated that evidence can be successfully incorporated into practice when staff are actively involved in the change process through consultation, timely provision of information, and active support by the unit leadership. Capitalizing on the experiences of empowerment and satisfaction expressed by nurses following this study, management can build on the gains of this project as this is an opportune time for establishing a safety climate within the Wake County Jail.

### Study Limitations

#### Survey Response Rate

Of the possible 46 nurse participants, 33 completed the pre-intervention survey, and 18 completed the post-intervention survey. Logistical reasons were largely accountable for some nurses not participating in the pre-intervention survey. The medical department of the Wake

County jail is spread over two physical locations. Nurses assigned to the satellite location are highly unlikely to provide patient care on the study unit; therefore those nurses might find it unnecessary to complete the pre-intervention survey knowing that their opportunity to be assigned to the unit are non-existent or at best, very slim. Another contributory factor to the less than optimal survey response rate pertains to departmental practice that excludes PRN staff from assignment to the study unit. In these circumstances PRN staff will likely decline participation in the survey, because departmental nursing assignment policy effectively precludes them from being included in the study sample.

**Non-Randomized Sampling**

The post-intervention survey group is particularly small because it involved a convenience sample of nurses who were assigned to the study unit during the project period and who actually participated in the study and utilized the SBAR-I-5 communication tool during nurse-to-nurse handoffs. The risk of selection bias in this study is minimized as seven of the eight nurses assigned to the study unit during the period of the study consented to participate. Further, the favorable comparability of the demographics of the study sample of nurses [See Table 4, p. 60], compared to the demographics of the population of nurses eligible to participate, also reduced the risk of bias. Finally, the congruence between the investigator's observations, the literature, and study findings seem to suggest that the likelihood of bias was minimal.

**Timing of Study Implementation**

Another limitation was the short time frame of seven weeks allocated for conduct of this study. A more extended study period, perhaps, six to 12 months, would allow for more robust data collection, afford participants more time for translating knowledge to practice, and would overall permit a more accurate assessment of sustainable change.

**Threats to External Validity**

External validity refers to the degree to which study findings can be appropriately applied to people and events outside of the study (Holley et al., 2013) and is concerned with generalizability. This analysis was based on interviews, comments, and observations of a specific sample of nurses working in a specific work setting, namely a 22-bed acute care medical services unit of a local county jail. Responses of nurses from this setting might be different from those in traditional hospital settings or other institutional settings. As such, no specific claims can be made regarding the generalizability of these findings.

Another threat to external validity is the small sample size (n=7) used in this study since it creates a risk of sampling error. However, as discussed earlier, this threat is minimized due to the close congruence between the sample and population characteristics [See Table 4, p. 60].

**Threats to Internal Validity**

Internal validity, according to Holley (2013), refers to "the degree to which the investigator draws correct conclusions about what happened in the study" (p.6). One threat to internal validity is selection bias that arises from the characteristics and motivations of respondents to a survey that might influence them to respond in a particular way such that it alters the conclusions drawn by the investigator (Holley, 2013). With a survey response rate of 72 percent, this implies that 28 percent or slightly over one quarter of the nurses who received questionnaires did not respond. It is possible that those nurses who responded possessed some compelling desire to do so and that such strong desires might have influenced their responses and the conclusions drawn.

Recall bias arising from participants' reliance on their memories to complete survey questionnaires poses another threat to internal validity. Additionally, observational studies are

typically subject to the "Hawthorne effect," referred to as the change in behaviors of participants when under scrutiny. This can also potentially bias the results and threaten internal validity. The inability to pair participants' pre- and post-intervention surveys because of inconsistent application of personal identifiers was another limitation encountered by this study.

## Management of Challenges and Barriers

During the course of the study three significant challenges and/or barriers were encountered. The first threat involved nurses' resistance to change. This practice improvement project involving standardization of the content and style of the handoff communication required a significant departure from the traditional norms of conducting the nurse-to-nurse handoff report. At the start of the project some nurses demonstrated overt resistance towards the project, likely relating to this innovation's departure from the nurses' traditional ways of managing the nurse-to-nurse handoff. The stress of adopting new work processes was evident in the initial low compliance of the nurses, for completing all elements of the SBAR I-5 Tool.

The second challenge reflected nurses' lack of support for the project stemming from the need for additional nurse documentation, and the slight increase in time at the start of the project for conducting the nurse-to-nurse handoff. This challenge was resolved in two ways. First, the primary investigator negotiated and obtained the approval of the Director of Nursing for nurses to be paid for the marginal increase in time required to conduct the new approach to the end-of-shift nurse-to-nurse handoff. However, as nurses developed greater competency in using the SBAR I-5 tool, they were able to complete the handoff within their previous time frame. In fact, nurses expressed the view that the benefit of greater comprehensiveness and improved quality of the report overall more than compensated for the slight increase in handoff time.

The third challenge presented when staffing shortfalls resulted in the loss of one of the original nurse participants in the study sample. This necessitated using nurses who had not initially been trained in the use of the study intervention, the SBAR Handoff Tool, to complete the study. Nevertheless this challenge had minimal impact because the SBAR I-5 Handoff Tool is easy to use. Nurses were able to develop proficiency in its use in a short time period through training and role play as directed by the researcher.

## CHAPTER 6: ANALYSIS & DISCUSSION

On conclusion of this project all study goals were accomplished. The purpose of the nurse-to-nurse handoff at shift change was to safely transfer responsibility and accountability for the patient from the off-going to the incoming nurse through comprehensive, timely communication that creates a shared, mutual understanding of the patient (Manser et al., 2013). This project showed convincingly that the standardization of the handoff combined with a safety feature that verifies the veracity of the information transferred, and validates mutual, shared understanding of the information transferred between nurses involved in the handoff, can improve handoff quality, patient safety, and nurses' satisfaction. This was evident by the significant improvements in the pre and post-intervention data generated by four data collection methods: Surveys, observations, nurses' semi-structured interviews, and retrospective patient chart reviews.

Creating work environments that encourage open, supportive communication has demonstrably been proven to improve team dynamics, staff satisfaction, quality of patient care and patient safety (Beckett & Kipnis, 2009). Following the SBAR I-5 evidence-based practice improvement, handoff communication strategy described in this discussion, nurses rated the quality of handoff communication on a 22-bed acute care medical services unit in a local county jail as 5.7 on a 7 point Likert scale, suggesting that the quality of the handoff was on average better than good, following the intervention. These findings were consistent with the Manser et al. study (2013) that positively rated the quality of clinician communication in the post-operative handoff as between 3.1 and 3.9 on a 5-point scale. In this study, Manser (2013) identified the

quality dimensions of an effective handover as: “discussion of patient care information, handover organization, establishing a shared understanding, and conduct” (Manser et al., 2013). In the O’Connell study, the quality dimensions that nurses rated as positively contributing to a quality handoff included: “quality of information, interaction and support, and efficiency” (O’Connell, 2014) closely parallel those measured by Manser (2013) and produced results that were similar.

It is noteworthy that while the handoff error rate increased marginally in the post-intervention phase, the patient care error rate declined drastically since errors were intercepted during the order verification check performed by both nurses at the end-of-shift nurse-to-nurse handoff. This verification step incorporating the medical record, and conducted jointly by the incoming and off-going nurses, represents an additional layer of safety that was introduced with the SBAR I-5 Handoff intervention to reduce patient care errors and increase patient safety. This project demonstrated staff transfer of evidence to inform knowledge, change behavior, and improve skills and practice which were successfully applied to achieve the project outcomes: Improvement in handoff quality; increased patient safety; increased nurses’ satisfaction; and decreased gap in nurses’ perception of each other’s performance in the handoff.

## Policy Implications / Future Research

This study was confined to an acute care 22-bed medical care services unit of a local county jail and sought to standardize the nurse-to-nurse handoff process and to evaluate the impact of the study intervention, the SBAR I-5 Handoff Bundle, on the quality of the nurse-to-nurse handoff, patient safety, nurses’ satisfaction, and nurses’ perception of each other’s performance in the handoffs. In light of the favorable results, the nursing leadership might wish to consider expanding this study to other care units of the jail such as the intake area, detoxification unit, and mental health units where improvements in nurse to nurse

communication at handoff can significantly impact staff and patient outcomes. While the findings of this study lack generalizability, future research might consider exploring the transferability of results to settings that share similar cultural and structural characteristics to the study setting. Also, since research shows that patient involvement in the handoff is linked to improved patient safety (Chaboyer, 2009; Eggins & Slade, 2015), future research might consider including patients in the handoff in order to evaluate its impact on safety in the jail setting.

This research identified major differences in the nurse team member's perceptions of each other's communication exchange (in-coming and off-going) at handoff. These gaps in nurse team (2-member) perceptions of their colleague's communication exchange at handoff create opportunity for misunderstanding and communication failures that potentially threaten patient safety. Considering that over 55 percent of nurses in this study speak a language other than English, and that at least one-third of those nurses are foreign trained, some of these differences are likely fueled by differences in nurse training, handoff practices, and different expectations in different cultural settings. Given the persistent nursing shortage in the U.S, and the internationalization of nursing through active recruitment and importation of nurses from foreign economies to fill the shortfall, the US might wish to consider policies that influence the nurse training curricula of those foreign countries where targeted nurse recruitment is conducted.

## Conclusions

Handoffs at care transitions between clinicians constitute a period of vulnerability in the care of the patient that, when poorly managed, can have negative consequences for all stakeholders including the patient, caregiver, and healthcare organization. This study implemented an evidence-based, quality improvement initiative, the SBAR-I-5 Handoff Bundle, to test its impact on improving the quality of the nurse-to-nurse handoff communication at shift

change, and to link improvements in handoff quality to improvements in patient safety and nurses' satisfaction.

Findings from this study indicate that nurses have found the SBAR I-5 Handoff intervention useful in improving communication effectiveness at handoff. Quality variables that favorably impacted communication effectiveness at handoff included: the comprehensiveness of the information shared; the organized, predictable structure of the report; and the ability to clarify information, receive anticipatory guidance, and verify information prior to the departure of the off-going nurse. The positive response of the nurses to the introduction of an evidence based quality initiative, the SBAR I-5 Handoff Tool, in the jail setting suggests that the safety climate might be ready for change. Management might wish to consider capturing the interests and motivations of the nurses in the wake of this study to introduce other quality initiatives that will signal a sustainable quality culture change in this setting.

**Table 1**: **Construction of The 4-item adapted HES survey**:
Survey to detect Differences in Perception of Handoff Quality between In-coming and Off- going Nurses

| Topics assessed | **4-item Adapted HES Survey In-coming Nurse** | **4-item Adapted HES Survey Off-going Nurse** |
|---|---|---|
| Adequacy of Handoff Information | I am provided with sufficient information about patients | I provide sufficient information about patients to the in-coming nurse |
| Inclusion of Important Information in Handoff | I feel that important information is not always given to me | I feel that I always give important information to the in-coming nurse |
| Updated Information in Handoff | The information I receive is up to date | The information that I provide to the in-coming nurse is up to date |
| Handoff is Easy to Follow | The way in which information is provided to me is easy to follow | The way in which I provide information to the in-coming nurse is easy to follow |

Note. Adapted from "Assessing the quality of patient handoffs at care transitions," by T. Manser, S. Foster, S. Gisin et al., 2010, 19 (e44).

Table 2: Summary: Descriptive Statistics Study Population
All nurses (N=46)

| **Years of Nursing** | Frequency | Percent (%) |
|---|---|---|
| 5 years or less | 6 | 13 |
| Between 6-10 years | 16 | 34.8 |
| Between 11-15 years | 6 | 13 |
| ≥ 16 years | 18 | 39.1 |
| **Highest Degree Earned** | | |
| Associate Nursing Degree | 30 | 65.2 |
| BSN | 16 | 34.2 |
| Other | 3 | 0.6 |
| **Current Position** | | |
| Staff Nurse | 45 | 97.8 |
| Nurse Supervisor | 1 | 2.2 |
| **Employment Status** | | |
| Full Time (FT) | 37 | 80.4 |
| Part Time (PT) | 2 | 4.3 |
| As Needed (PRN) | 7 | 15.2 |

Table 3: Summary: Descriptive Statistics Study Sample
Study Sample (n=6)

| **Years of Nursing** | Frequency | Percent (%) |
|---|---|---|
| 5 years or less | 1 | 16.7 |
| Between 6-10 years | 2 | 33.3 |
| Between 11-15 years | 1 | 16.7 |
| ≥ 16 years | 2 | 33.3 |
| **Highest Degree Earned** | | |
| Associate Nursing Degree | 5 | 83.3 |
| BSN | 1 | 16.7 |
| **Employment Status** | | |
| Full Time (FT) | 5 | 80.4 |
| Part Time (PT) | 1 | 4.3 |
| **Shift Worked** | | |
| Day | 4 | 66.7 |
| Night | 2 | 33.3 |

Table 4: Summary: Comparison of Descriptive Statistics Study Population and Sample Population (N=46) Compared to Study Sample (N=6)

| Years of Nursing | Population (%) | Sample (%) |
|---|---|---|
| 5 years or less | 13 | 16.7 |
| Between 6-10 years | 34.8 | 33.3 |
| Between 11-15 years | 13 | 16.7 |
| ≥ 16 years | 39.1 | 33.3 |
| **Highest Degree Earned** | | |
| Associate Nursing Degree | 65.2 | 83.3 |
| BSN | 34.2 | 16.7 |
| **Employment Status** | | |
| Full Time (FT) | 80.4 | 83.3 |
| Part Time (PT) | 4.3 | 16.7 |
| **Shift Worked** | | |
| Day | 66.7 | 58.7 |
| Night | 41.3 | 33.3 |

Table 7: 4-Item adapted HES survey Questionnaire
Incoming Nurse's Perception of Handoff Communication Received
Pre-intervention (baseline)

| Question # | Question | Nurse Pair 1 | Nurse Pair 2 | Nurse Pair 3 | Mean Score |
|---|---|---|---|---|---|
| 1 | I am provided with sufficient information about patients | 3 | 2 | 2 | 2.33 |
| 2 | I feel that important information is not always given to me | 5 | 4 | 4 | 4.33 |
| 3 | The information that I receive is up to date | 6 | 5 | 3 | 4.67 |
| 4 | The way in which information is provided to me is easy to follow | 3 | 2 | 2 | 2.33 |

Table 8: 4-item adapted HES survey Questionnaire
Off-going Nurse's Perception of Handoff Communication Given Pre-Intervention (baseline)

| Question # | Question | Nurse Pair 1 | Nurse Pair 2 | Nurse Pair 3 | Mean Score |
|---|---|---|---|---|---|
| 1 | I provide sufficient information about patients to the incoming nurse | 7 | 7 | 6 | 6.67 |
| 2 | I feel that I always give important information to the incoming nurse | 7 | 6 | 7 | 6.67 |
| 3 | The information that I provide to the incoming nurse is up to date | 7 | 6 | 6 | 6.33 |
| 4 | The way in which I provide information to the incoming nurse is easy to follow | 7 | 6 | 6 | 6.33 |

Table 9: Differences in Paired Responses of In-coming and Off-going Nurses' Perceptions of Handoff Communication Pre-Intervention (baseline)
Pre-Intervention (n=3 pairs)

| Q # | Question | Nurse Pair 1 | Nurse Pair 2 | Nurse Pair 3 | Mean | Difference |
|---|---|---|---|---|---|---|
| 1 | I am provided with sufficient information about patients<br>I provide sufficient information about patients to the incoming nurse | 3<br>7 | 2<br>7 | 2<br>6 | 2.33<br>6.67 | 4.34 |
| 2 | I feel that important information is not always given to me<br>I feel that I always give important information to the incoming nurse | 5<br>7 | 4<br>6 | 4<br>7 | 4.33<br>6.67 | 2.34 |
| 3 | The information that I receive is up to date<br>The information that I provide to the incoming nurse is up to date | 6<br>7 | 5<br>6 | 3<br>6 | 4.67<br>6.33 | 1.66 |
| 4 | The way in which information is provided to me is easy to follow<br>The way in which I provide information to the incoming nurse is easy to follow | 3<br>7 | 2<br>6 | 2<br>6 | 2.33<br>6.33 | 4 |

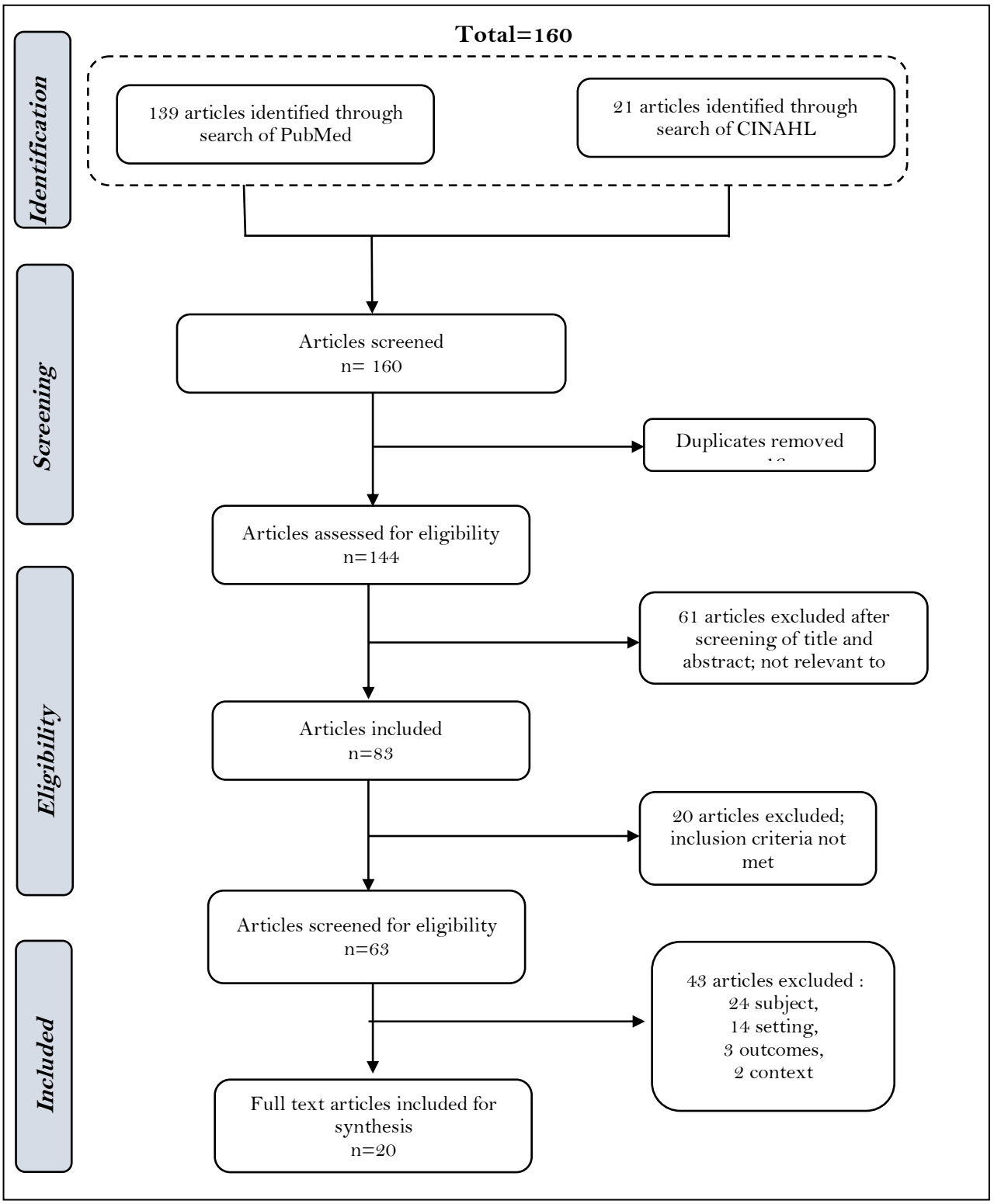
Table 10: Differences in Paired responses of In-coming and Off-going Nurses' Perceptions of Handoff Communication Post-Intervention SBAR I-5
(n=3 pairs)

| Question # | Question | Nurse Pair 1 | Nurse Pair 2 | Nurse Pair 3 | Mean | Difference |
|---|---|---|---|---|---|---|
| 1 | I am provided with sufficient information about patients<br>I provide sufficient information about patients to the incoming nurse | 6<br>7 | 7<br>7 | 7<br>7 | 6.67<br>7 | 0.33 |
| 2 | I feel that important information is not always given to me<br>I feel that I always give important information to the incoming nurse | 7<br>7 | 6<br>7 | 7<br>7 | 6.67<br>7 | 0.33 |
| 3 | The information that I receive is up to date<br>The information that I provide to the incoming nurse is up to date | 6<br>7 | 7<br>7 | 6<br>7 | 6.5<br>7 | 0.5 |
| 4 | The way in which information is provided to me is easy to follow<br>The way in which I provide information to the incoming nurse is easy to follow | 7<br>7 | 7<br>7 | 7<br>7 | 7<br>7 | 0 |

Table 11: Handoff Error Rates & Patient Care Error Rates Pre- and Post-Intervention.

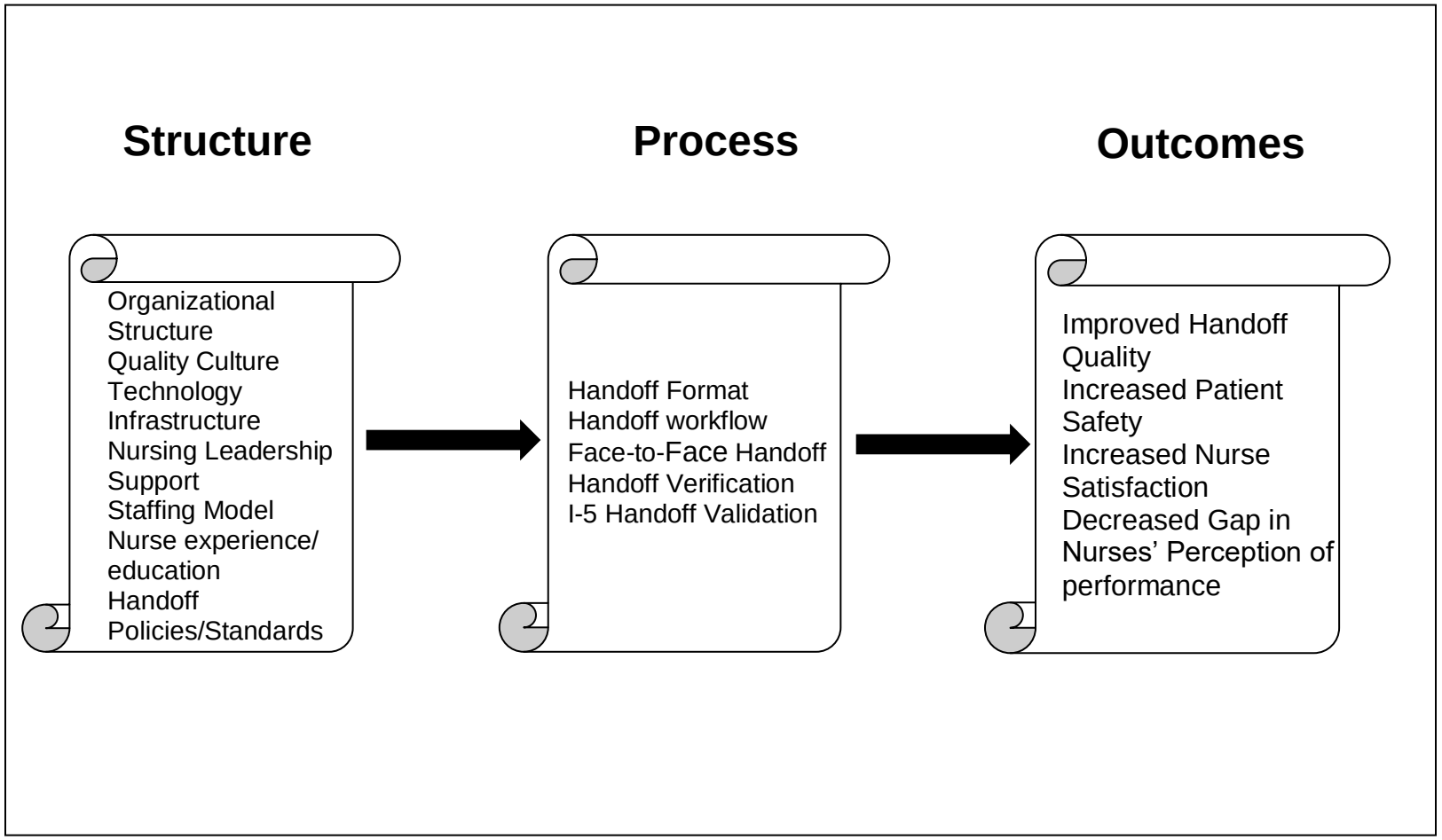
| | **Pre-intervention** | **Post-intervention** | **Difference** |
|---|---|---|---|
| # of charts reviewed | 7 | 7 | |
| # of Handoff errors identified | 6 | 10 | 4 |
| **Handoff Error rate** | 0.86 | 1.43 | |
| Handoff Error rate % | 12.24% | 20.4 % | 8.16% |
| # of errors Reaching patient | 6 | 1 | 5 |
| Error capture rate % | 0% | 90% | +90 |
| **Patient care error rate** % | 100 % | 10% | -90 |

Diagram 1: Article search and selection process using the PRISMA framework.



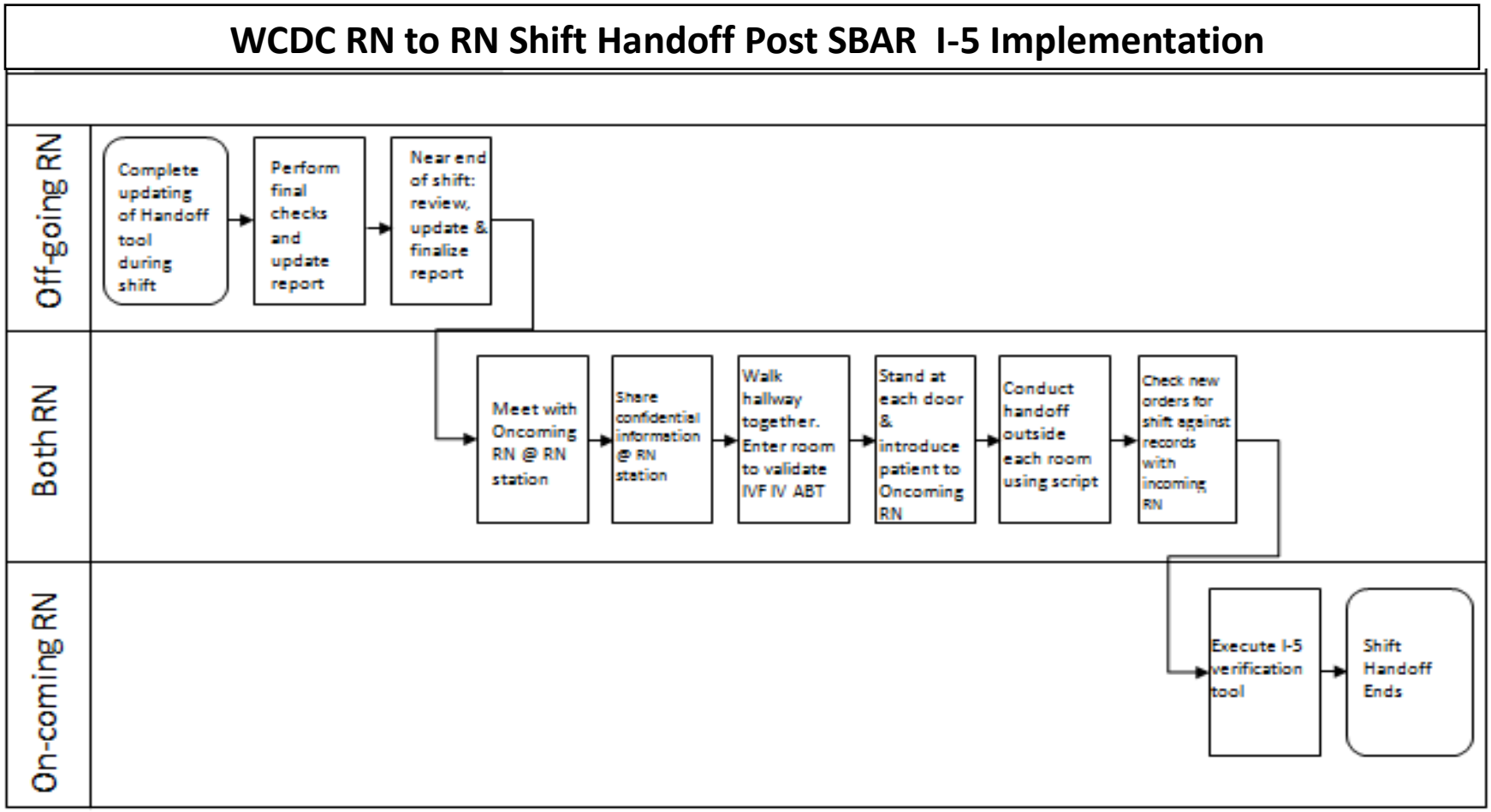

Adapted from "Short-term effects of intra-gastric balloon in association with conservative therapy on weight loss: A meta-analysis by Y. Zhang et al,. (2015). Journal of Translational Medicine,13, p. 246

Diagram 2: Donabedian S-P-O Quality Triad As Applied To Project




Note. Adapted from "An evidence based evaluation of the nursing handover process for emergency department admissions," by K. S. Delrue, 2013, Grand Valley State University Doctoral Dissertations. Paper 10.

Diagram 3: Jail Nurse Shift Handoff Process Future State



APPENDIX A-1

UNC IRB Approval

Superville, RN

---

**From:** IRB <irb_no_reply@unc.edu>
**Sent:** Friday, February 3, 2017 11:49 AM
**To:** Superville, Jemma G
**Cc:** Dieckmann, Janna L; Miller, Lisa H
**Subject:** IRB Notice - 16-3395

**To**: Jemma Superville
School of Nursing

**From**: Office of Human Research Ethics

**Date**: 2/02/2017
**RE**: Determination that Research or Research-Like Activity does not require IRB Approval
**Study #:** 16-3395

**Study Title**: Standardizing Patient Handoffs in Jail: A Quality Improvement Project to Improve End-of-Shift Communication Using the SBAR Handoff Bundle

This submission was reviewed by the Office of Human Research Ethics, which has determined that this submission does not constitute human subjects research as defined under federal regulations [45 CFR 46.102 (d or f) and 21 CFR 56.102(c)(e)(l)] and does not require IRB approval.

**Study Description:**

Purpose: To implement a healthcare Quality Improvement intervention to improve nursing services through improved nurse-to-nurse end-of-shift communication about sick patients who are currently detained in the 22-bed hospital services medical care unit of a county jail.

Participants: All Registered Nurses who are employed in the Medical Department of a county jail, and who work on at least a part-time basis providing hospital care medical services to patients.

Procedures (methods): This project utilizes a mixed methods approach comprising a combination of observation of nurse-to-nurse handoffs; taped nursing interviews; and

a pre-test/ post-test design pilot of the SBAR Bundle intervention on a 22-bed acute care hospital services medical care unit of a jail. Using a convenience sample of nurses participating in the twice daily end-of-shift nurse-to-nurse patient handoff, observation data collected will focus on the structure and process of the nurses' end-of-shift Handoff communication. Data on the quality of the handoff communication will be collected using the *Handoff Quality Rating Too*l. Nurses' perception of the Handoff communication will be collected using the *Handover Evaluation Scale* at baseline and post-intervention of the SBAR Bundle. Patient care error rates and handoff communication error rates will be computed following retrospective review of patients' medical charts pre- and post-intervention of the SBAR Bundle.

Please be aware that approval may still be required from other relevant authorities or "gatekeepers" (e.g., school principals, facility directors, custodians of records), even though IRB approval is not required.

If your study protocol changes in such a way that this determination will no longer apply, you should contact the above IRB before making the changes.

CC:
Janna Dieckmann, School of Nursing
Lisa Miller, School of Nursing Deans Office IRB Informational Message - please do not use email REPLY to this address

APPENDIX A-2

Approval Letter for Use of the Handover Evaluation Scale (HES)

Jemma Superville

101 Chieftain Dr

Holly Springs, NC 27540

23 February 2016

Dear Jemma,

Thank you for your interest in our handover research and, in particular, our staff survey.

We hereby provide you with permission to use our survey. We also provide you with permission to make adjustments to the survey, as necessary, to suit your local context.

Our original work using this survey was published in 2008 [O'Connell, B., Macdonald, K., & Kelly, C. (2008). Nursing handover: It's time for a change. *Contemporary Nurse, 30*(1), 2-11]. Since then we have conducted further analyses to establish the psychometric properties of the survey. A second paper was published in the Journal of Clinical Nursing and we suggest that you include this reference when acknowledging the source of the survey. We have not made any changes to the survey since this publication.

O'Connell, B., Ockerby, C., & Hawkins, M. (2014). Construct validity and reliability of the Handover Evaluation Scale. Journal of Clinical Nursing, 3(3-4), 560-570. doi: 10.1111/jocn.12189

Please find attached a PDF copy of the survey which is titled the Handover Evaluation Scale (HES). Our recent analysis has focused on Section C: Perceptions of Handover.

If you would like further information, please contact me via email: beverly.oconnell@ad.umanitoba.ca.

Kind regards,

Dr Bev O'Connell

Dean, Faculty of Nursing, University of Manitoba, Winnipeg, Canada.

Honorary Professor, School of Nursing and Midwifery, Deakin University, Australia.

APPENDIX A-3

The I-5 Verification Tool

| | |
|---|---|
| **I-5**<br>Verification Checklist | **Oncoming Nurse:**<br><br>Seeks clarification and validates plan of care and any orders using I-5 verification Checklist:<br><br>1. I know what is wrong<br>2. I know what to do<br>3. I know what to worry about<br>4. I know when to escalate<br>5. I see what you see |

Note. Adapted from "Patient handoffs: Delivering content efficiently and effectively is not enough," by J. S. Berger, and D. Stockwell, 2012, International Journal for Healthcare Quality, 31 (5), 19-28

## APPENDIX A-4
## The Participant Letter of Invitation

Dear Nurses:

You are invited to participate in a QI EBP project designed to evaluate the impact of an intervention, the SBAR Bundle, in effecting an improvement in the quality of the handoff communication, patient care error rate, and nurses' satisfaction. This will be accomplished by comparing nurses' perception of the handoff process, the rate of communication errors at handoff, and patient care error rates pre and post implementation of the SBAR Bundle. The SBAR Bundle comprises a standardized handoff protocol, the SBAR, the I-5 verification checklist, and an educational intervention.

Eligible participants for this project are all registered nurses, regardless of tenure, that are employed in the medical department of the Wake County Sheriff's office. A convenience sample of registered nurses in the Sheriff's office who utilize the SBAR Bundle during handoffs, and who provide written, informed consent to participate will be used.

By consenting to participate in this project, you agree to complete a 10-minute pre and post-test handoff evaluation survey, to utilize the SBAR handoff protocol and I-5 verification checklist during each handoff over a two-week period, and to permit analysis of the study results by the primary investigator. The survey will be distributed directly to you, and your written consent will be obtained at the time of distribution. Completed surveys will be collected within one week following distribution.

The surveys will be completed anonymously. To protect confidentiality, each participant will generate a personalized code for use as his/her identifier. Participants are encouraged to use the same code when completing the pre and post-test surveys to facilitate paired testing.

Your participation in this project is solely voluntary, and you may withdraw your participation at any time without penalty or victimization. There is no cost to participate in this project except for your time in completing the surveys.

The survey responses will be available to the primary investigator only. Participants will be identified by their personalized codes on all documents and reports.

Should you require further clarifications, please do not hesitate to contact the primary investigator at 919-274-1805 or via e-mail at supervij@email.unc.edu.

Thank you,
Jemma Superville, MBA, MSN, RN, AGNP-C
DNP student, UNC-CH

APPENDIX A-5

Manser Handover Quality Rating Form

| | YES | Rather yes | Rather no | NO |
|---|---|---|---|---|
| **Conduct of the Handover** | | | | |
| The handover followed a logical structure | 1 | 2 | 3 | 4 |
| The person handing over the patient continuously used the available documentation (patient chart, report form) to structure the handover | 1 | 2 | 3 | 4 |
| Not enough time was allowed for the handover | 1 | 2 | 3 | 4 |
| All relevant information was selected and communicated | 1 | 2 | 3 | 4 |
| Priorities for further treatment were addressed | 1 | 2 | 3 | 4 |
| The person handing over the patient communicated assessment of the patient clearly | 1 | 2 | 3 | 4 |
| Possible risks and complications were discussed | 1 | 2 | 3 | 4 |
| **Teamwork** | | | | |
| It was easy to establish contact at the beginning of the handover | 1 | 2 | 3 | 4 |
| There were tensions with the team during the handover | 1 | 2 | 3 | 4 |
| Too much information was asked for | 1 | 2 | 3 | 4 |
| Questions and ambiguities were resolved (active enquiry by the person assuming responsibility for the patient) | 1 | 2 | 3 | 4 |
| The team jointly assured that the handover was complete | 1 | 2 | 3 | 4 |
| **Handover Quality** | | | | |
| Documentation was complete | 1 | 2 | 3 | 4 |
| There was too much information given | 1 | 2 | 3 | 4 |
| Too much information was asked for | 1 | 2 | 3 | 4 |
| The patient's experience was considered carefully during the handover | 1 | 2 | 3 | 4 |
| **Circumstances of the Handover** | | | | |
| The person handing over the patient was under time pressure | 1 | 2 | 3 | 4 |
| The person taking on the responsibility for the patient was under time pressure | 1 | 2 | 3 | 4 |

Note. Adapted from "Assessing the quality of patient handoffs at care transitions," by T. Manser, S. Foster, S. Gisin et al., 2010, 19 (e44).

APPENDIX A-6

The 11-item Adapted Handoff Evaluation Scale

| |
|---|
| Please indicate your personal, self-generated code word here: _____ (save code for use at post-survey). |
| Please choose your response to the following demographic questions. |
| How long have you been a nurse <5 years 5-10 years 11-15 years >/= 16 years |
| Please indicate your educational level: Associate BSN MSN Doctorate Other |
| Do you work days or nights? Days Nights Gender? ---Male ---Female ---Other |
| Please indicate your response to the following questions regarding the current handoff process. |

| | Strongly Disagree | Disagree | Slightly Disagree | Neither | Slightly Agree | Agree | Strongly Agree |
|---|---|---|---|---|---|---|---|
| 1. I have the opportunity to discuss difficult clinical situations I have experienced. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2. I am provided with sufficient information about patients. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3. I have the opportunity to discuss workload issues. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4. I am often given information during handoff that is not relevant to patient care. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5. The way in which information is provided to me is easy to follow. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6. I am often interrupted by patients and other staff during handoff | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7. I am able to clarify information that has been provided to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8. Patient information is provided in a timely fashion. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9. I have the opportunity to ask questions about things I don't understand. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10. The information that I receive is up to date. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11. I feel that important information is not always given to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

Note. Adapted from "Construct validity and reliability of the Handover Evaluation Scale," by B. O'Connell, C. Ockerby, and M. Hawkins, 2014, *Journal of Clinical Nursing,* 3 (3-4), 560-570.

APPENDIX A-7

SBAR Handoff Tool

| | |
|---|---|
| Patient Demographics | Patient Name: Room #:<br>Date of birth/Age: Gender:<br>Allergies: Date of Admission:<br>MOU Day #: Family Social Contact: |
| **S**<br>Situation | **Offgoing Nurse**<br>Reason for Admission: Protocol: ETOH Benzo Opioid Combo<br><br>SW Psyche Obs<br><br>Isolation/Precautions:<br>Outside Appointments: Findings: |
| **B**<br>Background | **Offgoing Nurse**<br>Significant Past Medical Hx:<br><br>Significant Past Surgical Hx: Mental Health Hx: |
| **A**<br>Assessment | **Offgoing Nurse:**<br><br>Significant VS:<br>Significant labs:<br>IV sites/lines: IVF: Type/rate: Drains:<br>Assessment by Review of systems:<br><br>Neuro: Mental status Changes from baseline:<br><br>CV: EKG:<br><br>Resp: O2: Other devices:<br>GI/GU<br><br>Skin: Wounds/Incisions/Dressings Patient Specifics: |
| **R**<br>Recommendations | **Offgoing Nurse:**<br>Pending Labs/Diagnostics:<br>Referrals: Medical Psychiatrist Midlevel Outside Facility |

Note. Adapted from "Joint Commission introduces a new customized tool to improve handoff communications," by The Joint Commission, 2013. Retrieved from www.jointcommissionreport.org

APPENDIX A-8

Quality Data Capture Form: Errors
Sample Form Intended to be Blank

| ERRORS | Medical | Psyche | Mid-level | Dentist | Labs | Treatment | WCHS Testing | Outside Appts | Total |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |

APPENDIX A-9

Sample of Interview Questions

For conduct of semi-structured interview

1. Describe your experience with the handoff as occurs presently. What would you like to see changed? In what way would those changes you suggested help you?

2. What do you consider constitutes an ideal handoff? Have you ever had one? Have you ever given one?

3. How would you describe your ability to care for your patients after taking over the shift?

4. How would you describe your interaction with the nurse jointly involved in the report?

5. What would you say are some of the most notable changes that you observe or experience following the introduction of the SBAR tool? For example:

   - Ease of following the report
   - Sufficiency of information passed on
   - Your ability to ask questions; to clarify ambiguities

6. Any suggestions for further improvement?

7. Following the handoff, how well prepared are you to care for the patient. What do you think could improve your preparation to care for the patients?
8. How would you describe your interaction with the nurse at handoff? What suggestions do you have for improvement?

The primary investigator repeated interviews at the post-intervention phase of the study using the same questions in addition to some new questions that garnered nurses' feelings, opinions, and reactions to the new Handoff protocol. The post-intervention questions were as follows:

1. Describe your experience with the new handoff protocol.

2. How well do you find the new Handoff protocol meets your expectations of an ideal handoff?

3. Following the new Handoff protocol, how well prepared are you to care for the patients?

4. How would you describe your interaction with the nurse at handoff since the new Handoff protocol?

APPENDIX A-10

The AACCN Quality of Research Evidence Grading System

| Level | Description |
|---|---|
| Level A | Meta-analysis of multiple controlled studies or meta-synthesis of qualitative studies with results that consistently support a specific action, intervention, or treatment |
| Level B | Well-designed controlled studies, both randomized and non-randomized, with results that consistently support a specific action, intervention, or treatment |
| Level C | Qualitative studies, descriptive or correlational studies, integrated reviews, systematic reviews, or randomized controlled trials with inconsistent results |
| Level D | Peer-reviewed professional organizational standards, with clinical studies to support recommendations |
| Level E | Theory-based evidence from expert opinion or multiple case reports |
| Level M | Manufacturer's recommendations only |

Note. Adapted from "Upgrading AACN's evidence-leveling hierarchy" by R. Armola, A. Bourgault, and M. Halm, 2009, *American Journal of Critical Care,* 18, p. 405-409.

APPENDIX B-1

Comparison of Nurses' Satisfaction: Pre- and Post-SBAR I-5 Intervention

Paired Study Sample Results (n=6)

| 11-item adapted HES Survey Questions | **Pre SBAR I-5** Mean | **Post-SBAR I-5** Mean | Status | **Difference** |
|---|---|---|---|---|
| 1. I have the opportunity to discuss difficult clinical situations I have experienced. | 4.16 | 6.5 | Improved | 2.34 |
| 2. I am provided with sufficient information about patients. | 2 | 6.83 | Improved | 4.83 |
| 3. I have the opportunity to discuss workload issues. | 1.8 | 6.67 | Improved | 4.87 |
| 4. I am often given information during handoff that is not relevant to patient care. | 5.3 | 2 | Improved | -3.3 |
| 5. The way in which information is provided to me is easy to follow. | 2.83 | 6.67 | Improved | 3.84 |
| 6. I am often interrupted by patients and other staff during handoff | 6.33 | 5.17 | Improved | -1.16 |
| 7. I am able to clarify information that has been provided to me. | 4.33 | 6.83 | Improved | 2.5 |
| 8. Patient information is provided in a timely fashion. | 2.83 | 6.67 | Improved | 2.5 |
| 9. I have the opportunity to ask questions about things I don't understand. | 3.5 | 7 | Improved | 3.5 |
| 10. The information that I receive is up to date. | 4.17 | 6.67 | Improved | 2.5 |
| 11. I feel that important information is not always given to me. | 6 | 1.83 | Improved | -4.17 |

Note. Adapted from "Construct validity and reliability of the Handover Evaluation Scale," by B. O'Connell, C. Ockerby, and M. Hawkins, 2014, *Journal of Clinical Nursing,* 3 (3-4), 560-570.

Cumulative Overall mean: Pre-SBAR I-5 = 4.1 Cumulative Overall mean: Post-SBAR I-5 = 5.7

Difference in Overall mean Pre/Post- SBAR I-5 = 1.6

APPENDIX B-2

Major Factors impacting Nurses' Satisfaction with the Handoff

Study Sample (n=6)

| Factors | HES Survey Questions | Status | Difference in Pre/Post Test results |
|---|---|---|---|
| **Factor One**: Quality of information | Q2. I am provided with sufficient information about patients | Improved | +4.83 |
| | Q5: The way information is given to me is easy to follow | Improved | +3.84 |
| | Q11: I feel that important information is not always given to me | Improved | -4.17 |
| **Factor Two**: Interaction and Support | Q3: I have the opportunity to discuss workload issues | Improved | +4.87 |
| | Q9: I have the opportunity to ask questions about things I don't understand | Improved | +3.5 |
| **Factor Three**: Efficiency | Q4: I am often given information during handover that is not relevant to patient care | Improved | -3.3 |
| | Q8: Patient information is provided in a timely manner | Improved | +3.84 |

Note. Adapted from "Construct validity and reliability of the Handover Evaluation Scale," by B. O'Connell, C. Ockerby, and M. Hawkins, 2014, *Journal of Clinical Nursing*, 3 (3-4), 560-570.

APPENDIX B-3

Comparison of the Differences in Perception in Study Sample versus Control Group Post-SBAR I-5 Intervention

Comparison of the Study Sample (n=6) and the Control Group (n=7)

| 11-item adapted HES Survey Questions | Pre/Post SBAR I-5 Mean Difference **Study sample** | Pre/Post-SBAR I-5 Mean Difference **Control Group** | Difference Between Study Sample & Control Group |
|---|---|---|---|
| 1. I have the opportunity to discuss difficult clinical situations I have experienced. | 2.34 | 0 | 2.34 |
| 2. I am provided with sufficient information about patients. | 4.83 | -0.26 | 5.09 |
| 3. I have the opportunity to discuss workload issues. | 4.87 | 0.15 | 4.72 |
| 4. I am often given information during handoff that is not relevant to patient care. | -3.3 | 0.1 | -3.2 |
| 5. The way in which information is provided to me is easy to follow. | 3.84 | 0 | 3.84 |
| 6. I am often interrupted by patients and other staff during handoff | -1.16 | 0.85 | -0.31 |
| 7. I am able to clarify information that has been provided to me. | 2.5 | 0.14 | 2.36 |
| 8. Patient information is provided in a timely fashion. | 2.5 | 0.57 | 1.93 |
| 9. I have the opportunity to ask questions about things I don't understand. | 3.5 | 0.16 | 3.34 |
| 10. The information that I receive is up to date. | 2.5 | 0.14 | 2.36 |
| 11. I feel that important information is not always given to me. | -4.17 | 0.15 | -4.02 |

Note. Adapted from "Construct validity and reliability of the Handover Evaluation Scale," by B. O'Connell, C. Ockerby, and M. Hawkins, 2014, *Journal of Clinical Nursing,* 3 (3-4), 560-570.

APPENDIX B-4

Adapted 10-item Manser Handover Quality Rating Form

Handoff Quality Rating Pre- and Post-SBAR I-5 Intervention

| | YES | Rather yes | Rather no | NO | Pre-SBAR | Post SBAR | Diff mean |
|---|---|---|---|---|---|---|---|
| **Conduct of the Handover** | | | | | | | |
| The handover followed a logical structure | 1 | 2 | 3 | 4 | 3 | 1.7 | 1.3* |
| The person handing over the patient continuously used the available documentation (patient chart, report form) to structure the handover | 1 | 2 | 3 | 4 | 3.3 | 2 | 1.3* |
| All relevant information was selected and communicated | 1 | 2 | 3 | 4 | 2.7 | 1.7 | 1 |
| Priorities for further treatment were addressed | 1 | 2 | 3 | 4 | 3.3 | 1.7 | 1.6* |
| The person handing over the patient communicated assessment of the patient clearly | 1 | 2 | 3 | 4 | 3.3 | 2 | 1.3* |
| Possible risks and complications were discussed | 1 | 2 | 3 | 4 | 3 | 2 | 1 |
| **Teamwork** | | | | | | | |
| It was easy to establish contact at the beginning of the handover | 1 | 2 | 3 | 4 | 2.7 | 2.3 | 0.4 |
| There were tensions with the team during the handover | 1 | 2 | 3 | 4 | 3.3 | 2 | 0.8 |
| Questions and ambiguities were resolved (active enquiry by the person assuming responsibility for the patient) | 1 | 2 | 3 | 4 | 3 | 1.7 | 1.3* |
| **Handover Quality** | | | | | | | |
| Documentation was complete | 1 | 2 | 3 | 4 | 2.3 | 1.7 | 0.6 |

Note. Adapted from "Assessing the quality of patient handoffs at care transitions," by T. Manser, S. Foster, S. Gisin et al., 2010, 19 (e44).

Key: * subscales demonstrating the largest improvement post SBAR I-5 Intervention

APPENDIX B-5

Results of Nurses Interview Post-SBAR I-5 Implementation

| Themes | Nurses | Supporting Anecdotal Responses |
|---|---|---|
| Improved Communication | RN-1 | The handoff report follows a more predictable, organized structure that makes it a whole lot easier to follow |
| | RN-2 | More organized; more consistent |
| | RN-3 | The report is now structured; it follows a logical format |
| | RN-4 | Everyone is now using the same format; I feel like we are on the same page, and that helps a lot! |
| Improved Information Transfer | RN-1 | Now I know more than just why the patient is here; I have information on the patient's history- medical, mental, surgery. I now have a context and can take better care of the patient |
| | RN-2 | Before this SBAR, I wasn't sure I was getting everything; now, if I don't get something, I just have to look at the form and I know what is missing, and I ask for it |
| | RN-3 | I like the new form (SBAR I-5 tool) and the check off of orders at the end. If there is a problem, we usually catch it here and take care of it. Now I don't have to waste time looking for information that wasn't passed on |
| Improved Confidence | RN-1 | By checking all orders with the off-going nurse, this gives me greater confidence that my information is up to date, increases my confidence to continue the patient's care, and at least, I don't have to waste time looking for missing information after the nurse has gone |
| | RN-2 | Thanks for this new system (SBAR-I5), I now get a heads up of patients that are really very sick; who to watch out for; and what to do if they are going bad |
| | RN-3 | Good thing, the nurse gave me a heads up! So I changed things a little- I started with the sickest patient first. And guess what, the patient was actively vomiting when I got there. I gave him a shot and kept my eyes on him for the rest of the night |
| | RN-4 | And sure enough, the patient had a seizure that night; we ended up sending him out (to the hospital) |
| Improved Patient Safety | RN-1 | Since we started checking orders during handoff, we discover errors sooner, and before they can get to the patient to cause harm. This makes patient care safer |
| | RN-2 | Today was extremely busy for me with a lot of distractions and I forgot to give the patient his pain med at 6 o'clock (6 PM dose). But thanks for the handoff check, the error was identified and I was able to correct it promptly |
| | RN-3 | I'm happy that we found the error and corrected it; otherwise I would have an angry patient on my hand, and would have to waste a lot of time trying to find out whether the patient received his dose or not. This is not the way that you want to start your shift |

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