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Improving Patient Satisfaction in the Medical-Surgical Setting

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Improving Patient Satisfaction in the Medical-Surgical Setting

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This Manuscript Partially Fulfills the Requirements for the

Doctor of Nursing Practice Program and is Approved by:

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September 10, 2020

University of St. Augustine for Health Sciences DNP Scholarly Project Signature Form

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Title of DNP Project:						
In hospitalized medical-surgical patients, does the implementation of nursing bedside handoff report compared to the current desk handoff report improve patient satisfaction scores by 10% in two months? I have reviewed and approved this final written DNP Project. My typed name below serves as my electronic signature.						
Faculty/Preceptor Typed Name	Electronic Signature	Email Address	Date			
DNP Project Primary Faculty: Douglas M Turner						
DNP Project Preceptor: EM V. Garcia, PhD, DNP, APRN, NP-C	Digitally signaling IEV Comma, Pt. S., DEP, DEP, SERVICE COMMA, Pt. S., DEP, DEP, DEP, DEP, DEP, DEP, DEP, DEP	emgarcia@primehealthcare.com	08/21/20			
DNP Project Preceptor:						

Abstract

Practice Problem: Patients' experiences at hospitals are multidimensional, and their satisfaction with the service is linked to the quality of patient care provided. In evaluating the quality of care of a hospital, the nursing handoff of patients, and the engagement efforts of healthcare staff is an important element of patient satisfaction.

PICOT: In adult medical-surgical patients, does the implementation of nursing bedside handoff reports, compared to the current method of nursing practice desk handoff reports, improve patient satisfaction scores by 10% within two months?

Evidence: After reviewing 103 articles, 12 were relevant to this project, and included observation of an acute care setting and a focus on patient satisfaction.

Intervention: The patients' satisfaction and experience in the medical-surgical unit were measured by assessing the pretest and posttest evaluations with the Bradley inpatient (I-PAHC) and outpatient (O-PAHC) questionnaire.

Outcome: The results of the paired sample *t*-test revealed that patients' satisfaction levels with nurses (t (25) =-4.606, p < .05) and satisfaction levels with physicians (t (25) = -6.024, p < .05), both significantly improved after the intervention. In a regression model examining the relationship between the postintervention measure of nurse satisfaction and the overall hospital rating score, no clinical significance was noted between the two variables (R^2 = 0.128, F (1, 24) = 3.538, p > .05).

Conclusion: The project illuminated the need to continue educating nurses bi-annually to sustain the hospital's practice change and improve patient satisfaction. Time for more interprofessional collaboration should be provided for staff to be able to balance their time between bedside care and other tasks to learn evidence-based techniques related to patient satisfaction.

Improving Patient Satisfaction in the Medical-Surgical Setting

Factors that influence patients' experience at the hospital, and the satisfaction of the care they received is multifaceted (Berkowitz, 2016). Stricter reimbursement and performance guidelines are normal standards in healthcare, and many organizations use patient satisfaction as a metric of the healthcare payment system for quality care (Berkowitz, 2016; Xesfingi & Vozikis, 2016). Information related to patient satisfaction includes the ability of the care providers to meet patients' expectations, along with patients' perspectives and behavioral intentions (Xesfingi & Vozikis, 2016). Furthermore, the measure of patient satisfaction can help guide clinical outcomes and improve patient loyalty.

The practice of nursing handoff at hospitals affects patient satisfaction. Bedside handoffs involve the transition of responsibility from one nurse to another regarding a patient's care (Ford & Heyman, 2017). In 2006, The Joint Commission recognized that standardized nursing handoff communication is one of the National Patient Safety Goals (Berkowitz, 2016). The primary rationale for nurses to conduct an end of shift handoff at the patient's bedside is to encourage the patient and family to play a part in the process (Berkowitz, 2016). A patient's satisfaction and participation in the service enhances their feelings of safety, and patient satisfaction is linked to the frequency of bedside handoffs (Ford & Heyman, 2017). The purpose of this evidence-based project was to find out if the implementation of nursing bedside handoff reports, instead of the current practice of the desk handoff reports, would improve patient satisfaction scores in a medical-surgical unit by 10% within two months as measured by the HCAHPS score.

Significance of the Practice Problem

Bedside nursing handoffs are used to improve patient care quality, healthcare outcomes, and patient satisfaction (Jones, 2016). The miscommunication between healthcare providers during handoff processes can significantly impact patient satisfaction (The Joint Commission, 2018). Goncalves et al. emphasized that critical information is often lost during the handoff process, which affects the delivery of care to patients (2016). The transfer of a patient from one nurse to another increases the possibility of miscommunication (Hughes, 2012).

Miscommunication increases the risk of medication errors and complications, lengthens the hospital stay, and increases treatment (Ahmed et al., 2019).

A community hospital at Los Angeles struggles with patient experience and satisfaction scores based on inpatient surveys after discharge, as shown in the Healthcare News and Healthgrades websites. Patient satisfaction scores and communication with health providers were low in the community hospital, ranking between one or two out of five stars (Healthcare News, 2020). The hospital ranking method in California is called Healthgrades ratings, and it showed that 61% of patients ranked their satisfaction of their care at the hospital 8% lower than the national average. The goal of the medical-surgical unit was to increase its patient satisfaction scores by 10% over a period of two months.

Patient/Family

Increased competition in the healthcare field has influenced patients' experiences with hospital care (Karaca & Durna, 2019). It is crucial to improve patients' expectations, hospital experience, and satisfaction to maintain high hospital rankings. Patients' and families' perception of the care received is a direct measurement of the hospital's quality of nursing care (Goh et al., 2016). Individuals who are not accurately diagnosed or cared for appropriately will quickly

change healthcare facilities (Karaca & Durna, 2019). In contrast, patients who contribute to their plan of care and interact well with their nurses and healthcare providers express satisfaction, which results in greater adherence to recommended treatment plans and more positive health outcomes (Karaca & Durna, 2019). Bedside handoffs can help patients and nurses to have better healthcare outcomes.

Healthcare System

Patient satisfaction is a vital measurement of healthcare quality because it assesses the success of healthcare providers in meeting their patients' needs and expectations (Xesfingi & Vozikis, 2016). Furthermore, patient satisfaction is also a significant factor in determining a patient's perception and compliance with healthcare recommendations (Xesfingi & Vozikis, 2016). In the healthcare system, increased patient satisfaction is linked to compliance, diminished use of medical services, decreased malpractice and litigation, and positive healthcare outcomes (Xesfingi & Vozikis, 2016). In the last decade, patient satisfaction has been measured by surveys that focus on the patient's experience and quality of care, including waiting time, hospital cleanliness, and communication with healthcare providers (Patwardhan & Spencer, 2012). Patwardhan and Spencer (2012) emphasized that evidence-based projects from the patient's perspective is connected to the safety, availability, equity, and inclusiveness of care. From a provider's perspective, higher patient satisfaction increases customer retention and increase revenue (Patwardhan & Spencer, 2012).

Global Patient Satisfaction Incidence and Prevalence

Customer satisfaction plays an essential role in the quality of healthcare and service delivery reforms (Bleich, 2009). However, the results of satisfaction studies are limited due to the lack of universal acceptance of the definition of customer satisfaction or consistent

implementation of satisfaction standards (Bleich, 2009). Several organizations and researchers have focused on patient satisfaction related to the quality and health service provided, while others have concentrated on the healthcare system (Bleich, 2009). Both perspectives are imperative in evaluating patient satisfaction because content and comfortable individuals are more compliant with treatments, health services, and medication regimens. Patients who are pleased with their hospital care experience report better health outcomes and lower service costs.

Framework of the Problem

Kurt Lewin's (1951) Change Model, which consists of three stages — *unfreeze* (change), freeze, and refreeze — served as the framework and foundation for this evidence-based project. This model provided a simple and practical approach for comprehending the bedside nursing handoff change process in a personal and organized method (Lewin, 1951). For this evidence-based project, the unfreezing stage involved encouraging and preparing the nursing staff for the change in how bedside handoff reports were conducted. Next, the freezing stage involved motivating the team to accept and implement the change. Finally, the refreezing phase entailed new behavior patterns for the nursing staff to continue performing bedside handoff reports.

Unfreezing

The goal in this phase was to prepare the nursing staff to accept change. This step involved identifying the needed changes, which involved conducting bedside handoff reports. The hospital's website and HCAHPS report regarding patient satisfaction showed that change was required to increase the scores because the hospital's benchmark was below national compliance rates. To prepare the nursing staff for the additional responsibility, an intercollaboration team formed, which discussed buy-in with the nursing management team. Lewin's

(1951) change theory emphasizes that changes must be presented slowly to the staff, and the need for change must be established for success with any change.

Freezing

In this phase, the promotion and execution of bedside handoff reporting occurred. During this step, the nursing staff and the management team met weekly. Stakeholders were kept abreast of the project during bi-monthly meetings, ensuring that all participants remained aware of the project's goals and objectives. Furthermore, the nursing staff received education and training sessions during this phase. Ultimately, the goal of the training was to foster transparent communication among all involved individuals to obtain greater buy-in.

Refreezing

This last stage begins when evidence-based change is executed and becomes an organization's standard of practice (Lewin, 1951). During this phase, the nursing staff began to integrate organizational culture into their work, hence resisting further change (Lewin, 1951). During this stage, risk factors that hinder changes and implementation of strategies are identified (Lewin, 1951).

Scholarly Question

The PICOT question for this project was: In adult medical-surgical patients, does the implementation of nursing bedside handoff reports, compared to the current method of nursing practice desk handoff reports, improve patient satisfaction scores by 10% within two months?

- P Adult hospitalized medical-surgical patients
- I Bedside handoff report education
- C Compared to current nursing practice desk handoff
- O Nursing adherence that increases patient satisfaction scores by 10%

T – Two months

Population

The targeted population for this project was hospitalized medical-surgical patients between the ages of 18 to 65 years. The exclusion criteria included patients younger than 18 years of age, those unable to read or write English, and individuals with neurological or mental deficiencies, or altered mental status due to medication. The project included a comparison of the patient's orientation status against a previous nursing assessment. If visitors were present, permission was sought from the patient to have them included in the hand-off. All individuals were well informed of the project's purpose, risks, benefits, and confidentiality procedures.

Intervention

The intervention of this project began with a pre-evaluation of the hospital's HCAHPS scores related to patient satisfaction and beside handoff reports. A month before implementing the project, an interprofessional team formed, which included a nurse manager, unit secretary, certified nursing assistant, nurse liaison, and two registered nurses (day and night). The input was obtained from all members of the team during the project's planning and implementation phase.

The intervention used for the project was the implementation of the bedside handoff report, which incorporated the patient's input. For the intervention, a pretest was given to the patients regarding patient satisfaction. The nursing staff was provided an interactive educational intervention regarding patient satisfaction and the hospital's HCAHPS scores for the past year. Each patient completed a pre-patient satisfaction test upon admission and a satisfaction posttest on the day of their discharge. The pretest and posttest scores showed a difference between the previous nursing practices (none) eight weeks after the intervention was completed.

Comparison

Before the launch of this project, the comparison intervention was the annual report retrieved from the HCAPHS, Healthcare News, the hospital website, and the clinical nurse manager's information. The information on the hospital website was based on the surveys received from the hospital's inpatients after their discharge. The information included ten categories, which were further categorized into six reasons for patient experience/satisfaction results. Below are the scores from the HCAPHS:

- 1. Satisfaction with the hospital: 2/5 (40%)
- 2. Willingness to recommend: 2/5 (40%)
- 3. Satisfaction with MD communication: 2/5 (40%)
- 4. Satisfaction with nurses' communication: 2/5 (40%)
- 5. Satisfaction with discharge information: 1/5 (20%)
- 6. Staff responsiveness: 2/5 (40%)

The national benchmarks for patient satisfaction are as follows: nursing communication 80%, discharge instructions 53%, explanation of medications at 66%, and physician communication at 82% (Data.Medicare.gov, 2018). The identified gap was noted in the nursing communication related to discharge instructions, explanation of medications, and procedures.

Outcome

The intended outcome was for the medical-surgical nursing staff to use better communication skills to foster stronger connections with their patients. An evaluation and comparison of the pre-implementation rates and the post-implementation rates showed an increase in satisfaction. Two goals were set in place: the first goal was for medical-surgical patients to report higher nursing communication related to discharge instructions, medications,

and procedures, and the second goal was for the hospital ratings to increase by one star from its initial standing (i.e., 3/5, or 60%).

Time

The proposed timeline for this evidence-based project was eight weeks. However, due to the COVID-19 pandemic, data was collected and evaluated later than anticipated. The management of the hospital developed new policies for conducting projects to abide by the latest Centers for Disease and Prevention Control (CDC) and state guidelines regarding the disease. Weekly project updates occurred through the hospital's email system and Zoom platforms.

The goal of the project was to increase the nursing staff's awareness and decision-making processes related to bedside handoff reporting while also improving patient satisfaction scores. The clinical question was: In adult medical-surgical patients, does the implementation of nursing bedside handoff reports, compared to the current method of nursing practice desk handoff reports, improve patient satisfaction scores by 10% within two months?

The justification for the 10% benchmark was twofold. First, a 50% increase in patient satisfaction scores could not be achieved due to the timeframe limitation of the project because of the pandemic. Second, there was a possibility that incremental improvement would effectively motivate the staff to continue reaching higher benchmarks throughout the year.

Literature Search Strategy

This evidence-based project included searches from the following databases for the literature review: CINAHL, Cochrane Database of Systemic Reviews, ProQuest, PubMed, Medline, and Google Scholar. The selected studies were full-text, English-written journals published in the past five years, to offer the most relevant and current evidence-based information to discuss the PICOT question. Some older articles were relevant and included in the project. The inclusion

criteria consisted of systematic and peer-reviewed articles, evidence-based research, and studies based on patient satisfaction and bedside handoff reports. The selected journals contained information related to answering the PICOT question.

Exclusion Criteria

The literature review for this project did not include articles that did not focus on communication, education intervention or patient satisfaction, or articles published in a language other than English. Additionally, any literature that did not contain specific keywords related to the project and failed to meet the scholarly standards were excluded, along with articles published before the year 2015. Other excluded literature during the research process of this project included abstract-only articles, wrong interventions, and articles based on expert opinions.

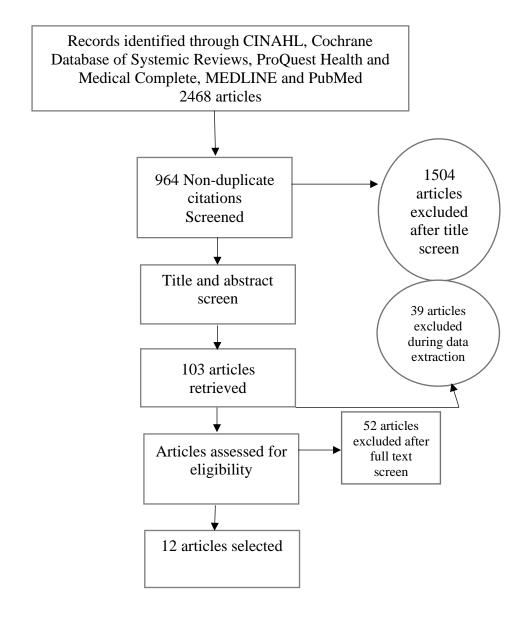
Literature Search Results and Evaluation

The search produced a total of 2,468 articles. The most relevant evidence was identified by applying inclusion and exclusion criteria to guide and focus the project. After a literature scan throughout the different databases, critical appraisals assisted in the evaluation of the clinical and statistical relevance of the selected articles. Most articles revealed expert opinions. Exclusion criteria was applied to abstracts and title screening, which resulted in 103 articles. After reviewing the 103 articles, a dozen met the standards for relevance to the project. Articles excluded in the elimination process of this review included literature reviews, articles that focused on other forms of hand-offs or occurred in a long-term care setting. Articles included were those that took place in an acute care setting and focused on patient satisfaction. The 12 articles were then organized, analyzed, and summarized to provide more information about the

PICOT question. The search process is summarized in the PRISMA model diagram illustrated in Figure 1.

Figure 1

PRISMA Chart of Literature Review Process

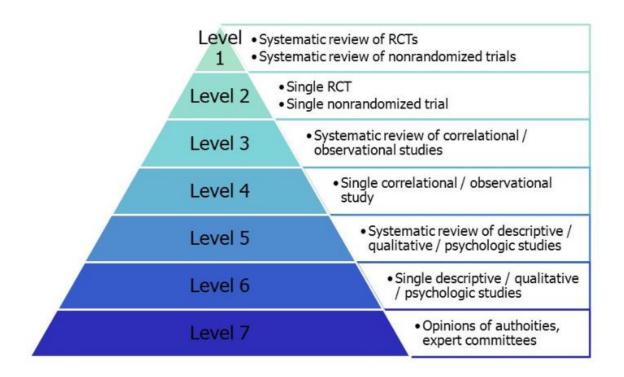


Determining the hierarchy of each article was a vital process during the literature review. According to Petrisor and Bhandari (2009), evidence hierarchy allows one to locate and rank evidence sources based on the strength of the evidence. Figure 2 illustrates a seven-level hierarchy (Concato et al., 2010). The evidence table presented in Appendix A shows the different evidence levels for the selected articles.

Figure 2

Hierarchy of Evidence (Concato et al., 2010).

Hierarchy of Evidence



Themes from the Literature

This section includes several themes identified during the evaluation of the selected literature for the project. Revealed themes and subthemes were based on previous and current empirical research related to patient satisfaction, patient engagement, effective communication, and bedside handoff reports (Evans et al., 2012; McAllen et al., 2018; Ofori-Atta et al., 2015; Radtke, 2013; Rush, 2012). The themes discussed the risks, complications, interventions, or evidence-based approaches for patient satisfaction. McAllen et al. (2018) and Evans et al. (2012) both emphasized that bedside handoff reports help prevent adverse events and allow nurses to check the patient's status quickly. The significance in the transfer of information during a

nursing transition in care was repeated frequently throughout the literature review. Handoffs that miss patient information can lead to medication errors, poor patient outcomes, and low satisfaction levels. Radtke (2013) illuminated the need for a standardized method of relaying information about patients between nurses and healthcare providers in the same facility. Furthermore, the identified subthemes included strategies to minimize miscommunication, promote accountability, and decrease patient and family anxieties (Ofori-Atta et al., 2015; Rush, 2012).

Practice Recommendations

The achievement and maintenance of patient satisfaction are crucial to nursing practice. The sustainability of patient satisfaction requires education interventions — particularly regarding communication between nurses and patients (Chapman, 2011). Norouzinia et al. (2016) stated that communication has many aspects that influence how patients share their experiences. Through bedside handoff reports, it is possible to boost the relationship between healthcare providers and patients (Maxson et al., 2012). This improvement is attributed to open conversations that make patients feel more involved throughout the treatment process (Maxson et al., 2012). Previous scholars have indicated that the enhancement of relationships between patients and their caregivers leads patients to have better perceptions of healthcare, which ultimately leads to improved treatment outcomes (Norouzinia et al., 2016). Based on the evidence presented in the themes above, bedside handoff reports are a practical approach for the patient's satisfaction, and most importantly, for better healthcare.

According to McAllen et al. (2018), miscommunication between care providers results in poor outcomes and low patient satisfaction. The implementation of bedside handoff reports resulted in positive outcomes, such as meaningful and critical patient-nurse exchanges (McAllen

et al., 2018). Additionally, patients' involvement in the treatment process helps to boost their satisfaction (Chapman, 2011). These reports enhanced communication between the care providers, which helped equip them with skills that not only promoted patient satisfaction but also enabled the patients to engage in productive self-management of chronic diseases and adhere to their recommended treatment (Levinson et al., 2010). For example, Evans et al. (2012) indicated that patients could manage their conditions through self-management activities, such as verifying changes in their urine color.

All articles supported that bedside handoff reports should be practiced between nurses and other healthcare staff within a facility to improve the satisfaction of patients, and most importantly, the quality of care that they receive. The literature showed that the traditional handoff led to lapses in communication, thereby leading to medical errors and miscommunication among the staff. This recommendation was a theme in the varied literature sources that led to the current selection of the intervention related to the PICOT question.

Project Setting

This evidence-based project took place at a nonprofit, Southern California hospital that serves the San Fernando Valley. It is a 153-bed secondary community hospital that delivers care to adult and geriatric patients with medical or surgical needs. The hospital serves a diverse population which includes patients from urban, suburban, and rural communities. The organizational need was based on focus groups and phone interviews from the community (e.g., health agencies, social service providers, and local government organizations). The KEYGROUP identified the needs of increased marketing regarding the services that the hospital provided, including mental health services and chronic care management.

The Los Angeles community hospital had several strengths and weaknesses. Three strong attributes of the facility were the commitment to maintaining advanced technology, the quality transparency dashboard, and the dedication and availability of the physicians. However, there were still areas in which the hospital had opportunities for growth and performance, such as improved professional development and the potential to become a member of the top 100 hospitals by improving patient satisfaction scores. The hospital faced threats such as competition from other organizations, such as Hospital Corporation of America and Dignity Health. The SWOT Analysis table in Appendix B shows the information on the strengths and weaknesses of the institution, as well as opportunities and threats to the institution.

The organization is well-known for its transformational leaders and the utilization of evidence-based strategies. The institution uses a divisional organization structure of several departments with various functions, such as the clinical lab, pharmacy, surgical services, 24-hour basic emergency care, a wound-center, hyperbaric services, radiology, and stroke-certified and JCAHO certified departments. The interprofessional collaboration was vital to the completion of this project. The mission statement is "to deliver compassionate, quality care to patients and better healthcare to communities" (Sherman Oaks Hospital, 2020, para. 1). The goal of the hospital is to deliver patient-centered healthcare with compassion, dignity, and respect for all patients (Sherman Oaks Hospital, 2020). Moreover, the hospital is a physician-founded and led facility that allows practitioners to oversee healthcare needs at each level (Sherman Oaks Hospital, 2020).

Project Overview

The mission of this project was to improve the experience, health outcomes, and satisfaction of patients. The long-term goal was to improve patient experience, health outcomes,

and satisfaction through the implementation of bedside handoff reports. The mission statement of the participating hospital is "to deliver compassionate, quality care to patients and better health to communities" (Sherman Oaks Hospital, 2020, para. 1). The mission and vision of the organization were interlinked with the vision and mission of this project in that they both focus on improving patient outcomes and satisfaction. The short-term objectives of the project included the following:

- Increase in HCAHPS scores of 2% in one month
- Identify potential barriers in implementing bedside handoff reports intervention Long-term objectives included:
 - Increase HCAHPS scores from 73% to 78% in two months
 - Increase positive responses received during the day nurse manager/clinical supervisor rounding by 10% in two months

The risks and unwanted consequences of the project included unwilling respondents and resistance to change by nurses. Additionally, the project could have failed to meet the set timeframe due to delays caused by stakeholders' actions.

Project Plan

The Plan, Do, Study, Act framework guided the implementation of this evidence-based project. This model provided a structure in the methods used to obtain and interpret information to improve the practices, products, and services of the hospital. The merit of this model was that small changes took place with an adequate assessment of their impacts (Taylor et al., 2014). The model was particularly useful in implementing small elements of the projects and measuring the impact of components, such as bedside reports and patient satisfaction.

The first step, *Plan*, included identifying the problem (patient satisfaction) and developing guidelines for improvement. The second step, *Do*, involved implementing the pre-implementation plan and followed the specific guidelines stated in the project proposal. The third step, *Study*, led to an assessment of the preintervention/post-intervention data collected. The findings provided the hospital leadership team with suggested strengths, weaknesses, and areas for growth opportunities. Then the last step, *Act*, looped the process to select areas for monitoring and adjusting for sustained improvement. This model could be used for individual and organizational changes related to patient satisfaction, as described in Appendix E.

Interprofessional collaboration is when several healthcare providers or workers from varied professional backgrounds work cohesively with patients, families, caregivers, and communities (Vega & Bernard, 2017). This led to the delivery of higher quality, patient-centered care. This interprofessional collaboration in the project occurred with the hospital manager, director, administration, and nursing preceptor. The expected benefits of the partnership included supervised guidance, administrative support, brainstorming, and improvement in patient outcomes (Vega & Bernard, 2017). The barriers to the implementation of the project included a lack of funds and the nurses' resistance to change. The budget for the project is presented in Appendix D.

Project Evaluation Plan

In this part of the evidence-based project, the identified outcomes noted in the PICOT question are discussed. The following sections include the recruitment and selection of participants, including the inclusion and exclusion criteria, the data collection and analysis processes, the methods for determining the success of the project, the setting and environment of the project, data storage, and the integrity of the overall process. In later sections, the procedures

associated with missing data and data security are described. The last sections in this discussion include the considerations related to the protection of human rights and the privacy of participants' information. The purpose of this evidence-based project was to evaluate whether the implementation of nursing bedside handoffs compared to the current practice of the desk handoff report would improve patient satisfaction scores by 10% in a medical-surgical unit within two months.

Recruitment and Selection of Participants

The method for recruiting participants was convenience sampling. The rationale for using this method was the location of the hospital where the project took place, patients' availability, and their willingness to participate in the EBP project (Etikan et al., 2016). Each admitted patient received an informational flyer regarding the purpose of the project. Participant requirements included being 18 to 65 years of age, currently being admitted on the medical-surgical floor, having the potential for home discharge (two to four days), and the ability to read and write English. The exclusion criteria included admission into other units, including intensive care, the emergency room, and pediatrics; patients mentally altered from medication or neurological issues; and patients over the age of 65. The G^* Power Software, version 3.1.9.2., used a large effect size, with an alpha level of .05, and a power of 80% to select an estimated minimal sample size of 34 (n = 34) to answer the clinical question.

Data Collection

The project occurred after receiving permission from the University of St. Augustine for Health Sciences (USAHS) Evidence-Based Practice Review Council and the facility (see Appendix C). Informational flyers were placed in the nurses' lounge, bathrooms, nurses' stations, and near-patient elevators. Each admitted patient received an informational flyer and gave

consent to participate. Patients' provided verbal and written consent after getting an explanation of the evidence-based project. The written consent described the project's purpose, risks, benefits, privacy, and confidentiality procedures. Any questions that potential participants had were answered before they began the four-item demographic survey. All participants understood that participating in the project was voluntary and knew that they could withdraw without penalty. Patients then completed an I-PAHC pretest, which covered five domains of care: *nurse communication*, *physician communication*, *physical environment*, *pain management*, *medication*, and *symptom communication*. The items were scored using a Likert scale that ranged from 1 (never) to 4 (always).

The participants completed their pretests upon admission to the unit, and they completed their posttests on the day of discharge. The tests were placed inside a manila envelope and securely transported in a briefcase. The hard copies of the tests remained secure in a locked home file cabinet. The questionnaires are scheduled to be destroyed at the required time (three years, August 2023) per St. Augustine's University's protocol.

In-Patient Assessment of Healthcare and Out-patient Assessment of Healthcare Survey

The instrumentation used for data collection in this project was the I-PAHC and O-PAHC developed by Dr. Elizabeth Bradley. Permission to use the instruments for the project was granted by the author on May 28, 2020. Dr. Bradley requested that the instrumentation used in the manuscript be cited. The I-PAHC portion of the tool was appropriate for the project because it is a tool for inpatients. The I-PAHC falls on a Likert scale ranging from 1 (never) to 4 (always) are in the I-PAHC questionnaire. See Appendix F for the instrument.

Validity. Leedy and Ormrod (2011) showed the validity of the I-PAHC tools using the construct and convergent cogency of the content. Webster et al. (2011) used the summary scores

of the questionnaires to evaluate the convergent validity. This was achieved by reviewing the statistical analysis of Pearson correlation (Pearson r) with the responses of the patient's overall evaluation items. The correlations of the summary scores for the scales and patients' evaluation were $.0.40 \ (p = 0.05)$.

Reliability. The Cronbach's alpha coefficients for the scales related to I-PAHC surveys surpassed 0.70 (Webster et al., 2011). This suggested excellent reliability scales in connection to communication with nurses and doctors, as well as pain management and medication factors (Webster et al., 2011)

Data Analysis

The pretest and demographic questionnaires were given to the participants upon admission to the medical-surgical unit. The demographic survey data included age, gender, diagnosis, educational level, and admission/discharge dates. The descriptive statistics were used to explain and document the chosen population and sample size (Leedy & Ormrod, 2011). The authors presented the descriptive statistics in graphics such as tables, figures, and scatter plots. The means, median, and mode were displayed to define the participants' categorical responses (Leedy & Ormrod, 2011). The participants completed the posttest on the day of their discharge home.

Paired Sample *t***-test.** A paired sample *t*-test was used to analyze the participant's hospital experience upon admission and discharge. The paired *t*-test evaluated the statistical significance by comparing the pretest and posttest; statistical significance was noted if the *p*-value was <. 05. Eight sub-questions were entered and coded in a Microsoft Excel spreadsheet and exported into the Statistical Package for the Social Sciences (SPSS) 26.

Pearson Correlation Test (Pearson's r). A regression model helped to determine whether nursing satisfaction was correlated with the hospital rating score following hospital care. Linear regression helped model the relationship between the variables by fitting a linear equation to observed data. This test is a parametric measure that evaluates the strength and direction of relationships between pairs of continuous variables (Leedy & Ormrod, 2011). In this project, the participants responded to standard questions during a bedside handoff report that was performed by the nurses to identify whether there was statistical evidence of a relationship between the variables (Leedy & Ormrod, 2011). A magnitude of the correlation (how close to -1 or +1) indicated the strength of the relationship. A correlation of -1 would indicate a negative linear relationship, 0 would indicate no relationship, and +1 would demonstrate a positive linear relationship (Leedy & Ormrod, 2011).

Data Storage and Integrity

Hard copies of the de-identified demographic I-PAHC surveys were downloaded and backed up to a CD, then transferred to a password-protected folder. The hard copies of the demographic and I-PAHC surveys were stored in a home office inside a locked file cabinet. The collected data will continue to be secured and will be destroyed in the specified time frame stated by University of St. Augustine for Health Sciences Review Council. The digital copies will be destroyed using the Active @KillDisk, which is a disk sanitation and partition eraser.

Handling of Missing Data. Missing data is information not stored in a variable of interest (Kang, 2013). The absence of data and assigned -99 was analyzed. If greater than 50% of the answers were missing during the coding phase, the questionnaire was deleted, and its data was not used. Utilizing this method allowed the statistical power used to be maintained while also avoiding the bias that could reduce the sample size's representation (Kang, 2013).

Data Security. Several practices were implemented for data security during the analysis stage of the project. Confidential data was stored on a flash memory device, which remains in an undisclosed, locked safe. All passwords were updated, encrypted, and protected, and were never shared or left on paper or workstations. A laptop used for the project was configured to lock after 10 minutes of inactivity to reduce the risk of theft or unauthorized usage. Additionally, all collected data was stored on a password-encrypted laptop within a compressed and encrypted file. All de-identified information will be destroyed according to St. Augustine University Review Council guidelines.

Protection of Human Rights

Participants were guaranteed protection and privacy by following the guidelines written in the Belmont Report (Zucker, 2013). All participants provided their written, informed consent before participating in the project. The instructions included the purpose of the project, risks related to loss of de-identified hard copies and the flash drive, and the ability of participants to withdraw from the project if they felt uncomfortable, without repercussion. No retaliation, personal, or professional harm occurred to any participant for not participating in or withdrawing from the project. Participants' concerns or questions related to the project were addressed. The returned demographic questionnaires and I-PAHC surveys were de-identified using codes consisting of the first two letters of the participant's last name, the last four digits of their cell phone number, and the year of the project. Finally, any unanticipated problems or changes related to the project were reported immediately.

Project Findings

Ultimately, it appears that the measurement of patient satisfaction is vital to the delivery of high-quality care. Such measures help nursing management, hospital administration, and staff

understand and meet patients' needs and expectations. Patient satisfaction is connected to conformity, decreased medical services usage, reduced litigation, and positive health outcomes (Xesfingi & Vozikis, 2016). The purpose of this evidence-based project was to evaluate whether the implementation of nursing bedside handoffs, compared to the current practice of the desk handoff reports, would improve patient satisfaction scores by 10% in a medical-surgical unit within two months. In this section of the paper, the statistical data results of the project are discussed.

Participants

During the pretest, participants provided demographic information by answering four questions. Participants consisted of females (n = 14) and males (n = 12). The sample consisted of 26 participants between 18 to 24 years of age (n = 4), 25 to 34 years of age (n = 5), 35 to 44 years of age (n = 4), 45 to 54 years of age (n = 6) and 55 to 64 years of age (n = 7). The participants' education was divided into six categories: high school or GED (n = 7), some college (n = 4), associate's degree (n = 4), bachelor's degree (n = 6), master's degree (n = 4) and doctoral degree (n = 1). The participants self-reported as White (n = 8), Black, Caribbean, or African American (n = 10), and Hispanic (n = 8). Prior to statistical analysis, the questionnaires were classified according to gender, educational background, age, nursing experience, and ethnicity.

Two paired-samples t-tests helped answer the clinical question and determine the level of patient satisfaction of a hospital stay by services provided by nurses and doctors. G*Power Software, Version 3.1.9.2, calculated a large effect size, an alpha level of .05, and a power of 80%, which helped to estimate the minimum sample size of 34 to answer the EBP PICOT question. The analysis showed that the PICOT question was underpowered (n = 26); therefore,

the sample size requirement was not met. Furthermore, noted threats to internal validity included sample size, history (participants did readings on their own), maturation (just by getting older), testing (memorized questions from pretest), and natural statistical regression (extremely high or low scores on the pretest naturally move closer to mean on the post).

A paired sample t-test compares the means of two scores. In this project, the test compared pre and post patient's satisfaction levels during a hospital stay while in the care of nurses, doctors, and health officers. The three variables for the SPSS data file represented two measurements from each participant (n = 26). The two mean scores for the pretest and posttest were compared to determine if they were significantly different, followed by a paired sample t-test to conclude whether they were different due to chance alone or if there was a true difference.

Satisfaction Level – Nurses

The results of the paired sample t-test revealed a statistically significant (t (25) = -4.606, p < .05), (p-value .000052) difference between patients' satisfaction with nurses before and after the intervention. The mean pretest for satisfaction level of patients during the first visit, when cared for by a nurse (M = 3.32, SD = 0.39), was significantly different from the patients' mean satisfaction level during the second visit (M = 3.59, SD = 0.35). The analysis indicated a change in the mean level, with the patients strongly agreeing that they were treated with courtesy and respect, carefully listened to, and that the nurses explained things well (see Table 1).

Table 1Level of Patient Satisfaction of a Hospital Stay by Services Provided by Nurses

	Before		After					
	Interv	ention	Intervention			95% CI		
Outcome	M	SD	M	SD	n		t	df
Satisfaction	3.32	0.39	3.59	0.35	26	[-0.391, -0.149]	4.606*	25

p = 0.05

Satisfaction Level – Doctors/Health Officers

The results of the second paired sample t-test indicated a statistically significant (t (25) = -6.024, p < .05), (p-value < .00001) difference in patients' satisfaction with doctors before and after the intervention. The mean pretest of patients' satisfaction level during the first visit, when cared for by a doctor/health officer (M = 3.28, SD = 0.36), was significantly different from the participants' mean satisfaction level during a second visit (M = 3.61, SD = 0.31). These findings revealed a change in patients' perceptions when they are treated with courtesy and respect, are carefully listened to, and are cared for by the doctors and health officers who explained topics and addressed concerns clearly (see Table 2).

Table 2

Level of Patient Satisfaction of a Hospital Stay by Services Provided by Doctors/Health Officers

	Before		After					
	Interv	ention	Intervention			95% CI		
Outcome	M	SD	M	SD	n		t	df
Satisfaction	3.28	0.36	3.61	0.31	26	[-0.447, -0.22]	6.024*	25

^{*}p = 0.05

Discussion of Findings and Implications

The outcomes of the project supported previous and current literature and other evidence-based studies. This indicates a connection between positive patient experiences and their satisfaction, which leads to improved clinical outcomes, patient safety, decreased admission rates, and regimen compliance (Richter & Muhlestein, 2017). The outcomes were significant because they supported current literature regarding evidence-based strategies about medical-surgical settings related to patient satisfaction and experience. Trzeciak et al. (2016), Betts et al. (2016), and Smith and Choma (2017) demonstrated that implementing patient satisfaction strategies allowed hospitals to concentrate on specific aspects and clinical outcomes.

Limitations of the Project

Limitations describe the restrictions beyond one's control (Simon & Goes, 2011). Three constraints influenced the results of the project: Any limits and inabilities of the environment due to the COVID-19 pandemic, the small sample size, and the project timeframe. It was impossible to control the circumstances surrounding this project related to the pandemic, which required renegotiations with the preceptor about conducting the project in conjunction with new mandated guidelines. Additionally, it was unfeasible to control the environment in which the participants provided their answers during the admission or discharge processes. It was probable that the participants responded differently depending on the time of day and conditions that occurred during their admission or discharge (Leedy & Ormrod, 2011).

The second limitation of this project was the small participant group. The current EBP project was limited to one medical-surgical unit. The participant group was 26 (n = 26), with an even division of 12 males (n = 12) and 14 females (n = 14), which caused the project to be underpowered. A larger participant group would have permitted higher evaluation of the average values of data, avoided potential errors, and minimized bias (Leedy & Ormrod, 2011). Larger participant groups could have improved the accuracy of the values and decrease outliers (Leedy & Ormrod, 2011). In the current project, a larger participant group related to patient satisfaction would have required considerable financial and time resources. The selection of participants during the admission and discharge process may have transferrable findings to other patient populations and units.

The third limitation of the project was the short timeframe of two months, which was considered an evidence-based project, as opposed to a longitudinal project, which typically occurs over a long time (Leedy & Ormrod, 2011). The relationship between patient satisfaction

and bedside handoff reportedly could not be determined. If a longitudinal project had been conducted, it could have measured the behavior of nursing staff and the consistency of performing the bedside handoff reporting over a more extended period. The longitudinal project employs repeated measures and follows individuals for an extended time, typically a year or decade (Caruana et al., 2015). A longitudinal project could assist the hospital in evaluating the participants' behaviors by assessing the relationships between variables and documenting the outcomes over varying timeframes (Caruana et al., 2015). Such findings may help nursing management teams to develop strategies to meet the staff's evolving needs and help improve patient satisfaction.

Conditions Acknowledged when Reporting Findings

In the weeks when the COVID-19 pandemic unfolded in the community, several challenges occurred when collecting data and analyzing the project's findings. Numerous meetings with the preceptor and nurse manager took place to discuss the direction of the project. The priority was to ensure that staff would adhere to proper social distancing while implementing bedside handoff reports. Another challenge was the influx of patients, which resulted in a shortage of nursing staff, an upheaval of standard nursing policies, and the development of new evidence-based solutions to the challenges of the unit. Many nursing students' clinical rotations were canceled or suspended in response to the COVID-19 crisis. So, only a small window of opportunity opened, which allowed the completion of the project versus finishing a policy-related project online.

Implications of the Project

This evidence-based project posed significant implications for medical-surgical nurses because they provide front-line care to patients. The data analysis showed that bedside handoff

reporting made a difference in the patients' perceptions and satisfaction with care. A significant difference was discovered in the patient scores related to the care and comfort with the nurses and physicians. The patient satisfaction education program served as the intervention for this project, and it can also be utilized in other hospital units, such as the emergency room, intensive care, the direct observation unit, and postpartum care. This intervention could also be implemented in clinical practice to educate students as well as current and future nurses at the hospital, based on the significance of the hospitalized patient satisfaction experience.

Theoretical Implications. Lewin's (1951) change theory guided the project by explaining how to implement change in the medical-surgical unit. This theory involves three steps — freeze, moving, and refreezing — needed to achieve a permanent change in clinical nursing practice. This theoretical foundation allowed for the improvement of the unit's existing strategies while also implementing a new method that incorporates patient satisfaction into the nurses' clinical practices. The educational intervention permitted nurses to recognize and learn how the patient experience and satisfaction affects the hospital's community standing, financial status, and healthcare outcomes.

Practical Implications. One crucial practical implication of the findings was related to the nurses' clinical practice. In the clinical setting, many nurses believe that they are too busy to participate in and implement evidence-based nursing practices and activities (Penz & Bassendowski, 2006). After making changes to include both nursing staff perspectives and feedback regarding patient satisfaction and workloads, the nursing staff reported that they required additional time, education, and training for continued patient satisfaction.

Recommendations to implement this topic during morning and evening nursing huddles before the beginning of the shift as a method for nursing management to learn strategies for execution in

clinical practice followed. This practice would ensure buy-in from the staff — both morning and evening staff — to sustain the program and increase the patient satisfaction scores, eventually, by 50%.

Plans for Dissemination

Edwards (2015) emphasized that developing a dissemination strategy is a critical part of the evidence-based process. The first step was sharing the generalized version of this project's findings with the hospital administrator, followed by the nurse manager and nursing staff. This took place during a 30-minute PowerPoint presentation on Zoom, which allowed feedback from all parties. Individuals who could not attend the meeting received an email that summarized the findings. An oral presentation occurred to meet the requirements for the University of St. Augustine for Health Sciences. Future monitoring is required to validate the practice's sustainability of the practice of bedside handoffs.

The project findings will be disseminated through a poster presentation at California's Board of Nursing annual state conference (nursing practice committee), proposed for October 2020. The project will be submitted to a peer-reviewed nursing journal to be considered for further dissemination of the results. The first peer-reviewed nursing journal is the *American Journal of Nursing*, which is the oldest nursing journal in the United States.

Conclusion

The implementation of bedside handoff contributes to patient satisfaction. Other traditional forms of reporting may lead to lapses in communication, which can affect patients negatively, including medical errors, lengthened hospital stays, and high financial costs. Based on the evidence presented concerning bedside handoff reports, this intervention promotes improved patient engagement in the treatment processes and healthcare decisions. The findings

of the project may be beneficial to nurses by encouraging casual conversations and developing strategies related to decreased miscommunication with their patients. Ten percent or more improvement in patient satisfaction scores was expected and achieved at the hospital after the execution of the intervention.

Patient satisfaction and experience metrics deliver information on the ability of healthcare providers to meet patient expectations. Such measurements offer insights on patients' viewpoints and behavioral intentions. Enhanced patient satisfaction increases clinical outcomes and patient loyalty for the surrounding community of the hospital. Bedside handoffs, along with patient engagement, allows for a smoother and clearer transition from one nurse to another. The purpose of this evidence-based project was to evaluate whether the implementation of nursing bedside handoffs, compared to the current practice of desk handoff reports, would improve patient satisfaction scores. The project findings validated those of previous scholars such as Berkowitz (2016), Webster et al. (2011), and Ford and Heyman (2017). As a result, the goal for all advanced practice nurses should be to continue educating nursing staff in conducting bedside shift handoffs to engage patients and families in the healthcare processes and to ultimately improve care outcomes.

References

- Ahmed, Z., Saada, M., Jones, A. M., & Al-Hamid, A. (2019). Medical errors: Healthcare professionals' perspective at a tertiary hospital in Kuwait. *PLOS One*, *14*(5), 5-31
- Berkowitz, B. (2016). The patient experience and patient satisfaction: Measurement of a complex dynamic. Online Journal of Issues in Nursing.

 http://ojin.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJ IN/TableofContents/Vol-21-2016/No1-Jan-2016/The-Patient-Experience-and-Patient-Satisfaction.html
- Betts, D., Balan-Cohen, A., Shukla, M., & Kumar, N. (2016). *The value of patient experience: Hospitals with better patient-reported experience perform better financially*. Deloitte

 Center for Health Solutions. https://www2.deloitte.com/us/en/pages/life-sciences-and-healthcare/articles/hospitals-patient-experience.
- Bleich, S. (2009). How does satisfaction with the health-care system relate to patient experience? *Bulletin of the World Health Organization*, 87(4), 271-278. https://doi.org/10.2471/blt.07.050401
- Caruana, E. J., Roman, M., Hernández-Sánchez, J., & Solli, P. (2015). Longitudinal studies. *Journal of Thoracic Disease*, 7(11), E537–E540. https://doi.org/10.3978/j.issn.2072-1439.2015.10.63
- Chapman, K. (2011). Improving communication among nurses, patients, and physicians. *American Journal of Nursing*, 109, 21-25. https://doi.org/10.1097/01.naj.0000362013.53342.17

- Concato, J., Shah, N., & Horwitz, R. (2010). Randomized, controlled trials, observational studies, and the hierarchy of research designs. *New England Journal of Medicine*, 342 (25), 1887-1892. https://pubmed.ncbi.nlm.nih.gov/10861325/
- Data.Medicare.gov. (2018). *Patient survey (HCAHPS) National*. Retrieved from https://data.medicare.gov/Hospital-Compare/Patient-survey-HCAHPS-National/99uew85f
- Edwards, D. (2015). Dissemination of research results: On the path to practice change. *Canadian Journal of Hospital Pharmacy*, 68(6), 465-469.

 https://doi.org/10.4212/cjhp.v68i6.1503
- Etikan, I., Musa, S., & Akassim, R. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics*, *5*(1), 1-4. https://doi.org/10.11648/j.ajtas.2016501.11
- Evans, D., Grunawalt, J., McClish, D., Wood, W., Friese, C. (2012). Bedside shift-to-shift nursing report: Implementation and outcomes. *MEDSURG Nursing*, 21(5), 281-292. https://pubmed.ncbi.nlm.nih.gov/23243785/
- Goh, M., Ang, E., Chan, Y., He, H., & Vehvilainen, K. (2016). A descriptive quantitative study on multi-ethnic patient satisfaction with nursing care measured by the revised humane, caring scale. *Applied Nursing Research*, *31*, 126–131. https://doi.org/10.1016/j.apnr.2016.02.002
- Gonçalves, M., Rocha, P., Anders, J., Kusahara, D., & Tomazoni, A. (2016). Communication and patient safety in the change-of-shift nursing report in neonatal intensive care units.

- Texto & Contexto-Enfermagem, 25(1). 161-169 https://www.redalyc.org/pdf/714/71444666010.pdf
- Healthcare News. (2020, June). *Putting patient experience at the center of care*. https://www.healthcareitnews.com/news/asia-pacific/putting-patient-experience-centercare
- Hughes, R. (Ed.). (2012). *Patient safety and quality: An evidence-based handbook for nurses* (Vol. 3). Agency for Healthcare Research and Quality.
- Joint Commission. (2018). *The national patient safety goals*. http://www.jointcommission.org/standards_information/npsgs.aspx
- Jones, T. (2016). Outcome measurement in nursing: Imperatives, ideals, history, and challenges.

 Online Journal of Issues in Nursing, 21(2). 465-476.

 https://ojin.nursingworld.org/MainMenuCategories/ANAMarketplace/ANAPeriodicals/OJIN/
- Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anesthesiology*, 64(5), 402-406. https://doi.org/10.4097.kjae.2013.64.5.402
- Karaca, A., & Durna, Z. (2019). Patient satisfaction with the quality of nursing care. *Nursing Open*, 6(2), 535–545. https://doi.org/10.1002/nop2.237
- Leedy, P., & Ormrod, J. (2011). *Practical research: Planning and design* (10th Ed.). Pearson/Merrill Prentice Hall.
- Levinson, W., Lesser, C. S., & Epstein, R. M. (2010). Developing physician communication skills for patient-centered care. *Health Affairs*, 29(7), 1310-1318. https://www.healthaffairs.org/doi/full/10.1377/hlthaff.2009.0450

- Lewin, K. (1951). Problems of research in social psychology. In D. Cartwright (Ed.), *Field theory in social science*. Harper & Brothers.
- Maxson, P., Derby, K., Wrobleski, D., & Foss, D. (2012). Bedside nurse-to-nurse handoff promotes patient safety. *Medical-Surgical Nursing*, 21(3), 140. www.aahs.org/wp-content/uploads/Bedside-Nurse-to-Nurse-Handoff-Promotes-Patient-Safety.pdf
- McAllen, E., Stephens, K., Swanson-Biearman, B., Kerr, K., & Whiteman, K. (2018). Moving shift report to the bedside: An evidence-based project. *Online Journal of Issues in Nursing*, 23(2). https://ojin.nursingworld.org/MainMenuCategories/
 ANAMarketplace/ANAPeriodicals/OJIN/
- Norouzinia, R., Aghabarari, M., Shiri, M., Karimi, M., & Samami, E. (2016). Communication barriers perceived by nurses and patients. *Global Journal of Health Science*, 8(6), 65-74. https://doi.org/10.5539/gjhs.v8n6p65
- Ofori-Atta, J., Binienda, M., & Chalupka, S. (2015). Bedside shift report: Implications for patient safety and quality of care. *Nursing*, 45(8), 1-4. doi: 10.1097/01.NURSE.0000469252.96846.1a
- Patwardhan, A., & Spencer, C. (2012). Are patient surveys valuable as a service-improvement tool in health services? An overview. *Journal of Healthcare Leadership*, *4*, 33-46. https://doi.org/10.2147/jhl.s23150
- Penz, L. & Bassendowski, S. (2006). Evidence-based nursing in clinical practice: Implications for nurse educators. *Journal of Continuing Education in Nursing*, *37*(6), 250-254. https://sss.researchgate.net/publication/665143
- Petrisor, B. A., & Bhandari, M. (2009). Imaging after trauma to the pelvis and hip. *Bmj*, 338(Mar11 2). doi:10.1136/bmj.b289

- Petrisor, B., & Bhandari, M. (2009). Imaging after trauma to the pelvis and hip. *British Medical Journal*, 338, 289-b289. https://doi.org/10.1136/bmj.b289
- Radtke, K. (2013). Improving patient satisfaction with nursing communication using bedside shift report. *Clinical Nurse Specialist*, 27(1), 19-25. https://pubmed.ncbi.nlm.nih.gov/23222024/
- Richter, J., & Muhlestein, D. (2017). Patient experience and hospital profitability: Is there a link?

 Health Care Management Review, 42(3), 247–57.

 https://doi.org/10.1097/HMR.000000000000105
- Rush, S. (2012). Bedside reporting: Dynamic dialogue. *Nursing Management*, *43*(1), 40-44. https://doi.org/10.1097/01.NUMA.0000409923.61966.ac
- Sherman Oaks Hospital. (2020). *Hospital rankings inpatient experience*.

 https://health.usnews.com/best-hospitals/area/ca/sherman-oaks-hospital-6933516#rankings
- Simon, M., & Goes, J. (2011). Dissertation and scholarly research: Recipes for success. doi: 10.3138/jsp.43.1.39
- Smith, M., & Choma, T. (2017). Patient satisfaction in musculoskeletal medicine. *Current Review Musculoskeletal Medicine*, 10(2), 207-2011. doi:10.1007/s12178-017-9403-x
- Taylor, M., McNicholas, C., Nicolay, C., Darzi, A., Bell, D., & Reed, J. (2014). Systematic review of the application of the plan–do–study–act method to improve quality in healthcare. *BMJ Quality & Safety*, 23(4), 290-298. https://doi.org/10.1136/bmjqs-2013-001862
- Trzeciak, S., Gaughan, J.P., Bosire, J., & Mazzarelli, A.J. (2016). Association between Medicare summary star ratings for patient experience and clinical outcomes in U.S. hospitals.

Journal of Patient Experience, 3(1), 6–9. https://doi.org/10.1177/2374373516636689

Vega, C., & Bernard, A. (2017). Interprofessional collaboration to improve health care: An introduction. *Medscape CME & Education*.
https://www.medscape.org/viewarticle/857823#

- Webster, T., Mantopoulos, J., Jackson, E., Cole-Lewis, H., Kidane, L., Kebede, S., Abebe, Y., Lawson, R., & Bradley, E. (2011). A brief questionnaire for assessing patient healthcare experiences in low-income settings. *International Journal for Quality in Health Care*, 23 (3), 258-268. https://doi.org/10.1093/intqhc/mzr019
- Xesfingi, S., & Vozikis, A. (2016). Patient satisfaction with the healthcare system: Assessing the impact of socioeconomic and healthcare provision factors. *BMC Health Services*, *16*(94), 1-4. https://doi.org/10.1186/s12913-016-1327-4
- Zucker, D. (2013). The Belmont Report. Encyclopedia of Statistical Sciences.

doi:10.1002/0471667196.ess7160

Appendix A

Evidence Table

Narasimhan, M., Eisen, L. A., Mahoney, C. D., Acerra, F. L., & Rosen, M. J. (2016)	Radtke (2013)	Sand- Jecklin (2013)	Bradley & Mott (2014)	Cacal & Moy (2013)
Randomized control trial/Quantitative	Patient satisfaction (evaluated with postdischarge surveys)		Quasi- experimental	Randomized Controlled Trial
Level IV	Level VI	Level III	Level III	Level II
1A	1B	2A	1C	1A
To evaluate the effect of a standardized worksheet on physicians' and nurses' perceptions of goals of care and on patients' length of stay in an intensive care unit	Determine if standardizing shift report using SBAR improved patient satisfaction with nursing communication	Change practice on medical-surgical units to promote safety and nursing satisfaction	Formulation of a policy requiring bedside reports to improve patient safety and satisfaction with nursing communication	To determine if bedside report would increase both patient and nurse satisfaction
The study was done in the medical ICU of Beth Israel Medical Center, a 697-bed Teaching hospital serving the lower east side of Manhattan and Brooklyn	Bedside reporting was implemented, and 66 Patient surveys taken after discharge from a hospital over three months	Seven medical- surgical units at a large teaching hospital, but patients discharging on the day the study began (less than 48 hours admitted were not included	The self-selected sample included nine inpatients (five women, four men) and 48 self-selected enrolled/register ed nursing staff (47 women, one man) from three	Critically ill patients admitted to a labor and delivery unit

			acute hospital	
			wards in rural	
			South Australia	
In-person communication intervention and participants were randomly assigned to either an experimental or control group and followed up for nine months	Medical- surgical intermediate care unit	The nursing handoff report was modified from a recorded report (following SBAR format) to a blend of both recorded (condensed SBAR format) and bedside components. Baseline, one month., pre and postimplementati on data were recorded. A training video was made for the nurses.	A mixed- method, pretest- posttest evaluative approach involving quasi- experimental and ethnographic elements was used. Patient perceptions were obtained using ethnographic interviewing. Staff perceptions of patient involvement were obtained through questions rated on a seven-point Likert scale and ethnographic	Bedside report was implemented on a labor and delivery unit to evaluate if it improved patient satisfaction and safety.
			interviewing.	
After six weeks,	RNs'	Increased patient	Results	Bedside report
the most	perception of	satisfaction and	indicated that	was implemented
significant	bedside report	nurse perception	patients	on a labor and
improvements	was positive:	of accountability	preferred the	delivery unit to
were in	noting they	and patient	bedside	evaluate if its
understanding of	could make	involvement but	handover	improved patient
the goals for the	sense of their	reduced nurse	method over the	satisfaction and
day: nurses'	patients'	perceptions of	traditional	safety as well as
scores improved	conditions	efficiency and	closed-door	teamwork among
(P = .001) from	sooner, could	effectiveness of	office handover	the nurses
3.9 (SD 1.02) to	prioritize	the report. Patient	approach. The	practicing it and
4.8	their day	falls (35%	key differences	was found to be
(SD 0.39) and	around	reduction rate) at	(as defined by	successful in all
physicians' scores	around			
improved (P =		*		aspects
Improved (I –	patient needs	shift change and	patients) were	aspects
-	patient needs patient	shift change and medication errors	patients) were that the bedside	aspects
.03) from 4.6 (SD	patient needs	shift change and	patients) were	aspects

0.32). Scores remained high nine months later in both groups: 4.4 (SD 0.51) for nurses and 4.6 (SD 0.61) for physicians. other physicians and nurses also reported significant improvement in communication with each other: nurses' scores improved (P=.03) from 3.6 (SD 0.87) to 4.3 (SD 0.87), and physicians' scores improved (P = .01) from 3.4 (SD 0.90) to 4.7 (SD 0.48). Communication scores remained high nine months after the worksheet was implemented (4.2 for nurses and 4.4 for physicians)	n increased from 75% to 87.6% Bedside shift	overtime remained unchanged. A routine	social aspects for the patient. Patients could know who is looking after them, and patients are included in discussions related to their care.	The authors
agreed that the results of this study supported the use of simple goals worksheet to improve communication between nurses and physicians.	reports were associated with positive impacts such as decreased falls, which in turn improved patients' satisfaction.	presence of a registered nurse promoted patient safety, as seen by the declining falls scores. Patient certainty of nurse presence and the trust in the	The results demonstrated that both patients and staff perceived patients to be more involved in their care under the bedside	concluded that bedside shift reports were crucial not only in enhancing patients' satisfaction scores but also on

strengths was that the worksheet was designed as a template with spaces for the team to fill in the plan during	A limitation was that the evidence- based design prevented generalization of findings to other settings; however, the	nursing care through bedside shift reports flourished since the implementation of the BSR intervention. They were evidenced in increased patient satisfaction scores and patient surveys. A convenience sample was used, which could hinder the generalizability of the study.	handover approach. The literature noted a recent move towards adopting patient- centered care approaches in clinical settings and the many benefits associated with this style of care. Study strengths included a large, diverse population and detailed assessments of patient experiences of communication	There was a potential non-response bias, and the findings may not be generalized.
and thus minimal amount of time was required to fill in the worksheet. The worksheet could easily be modified and applied to other units in the hospital. Attaining education on how to use the reports was helpful to the physicians, not only in improving their communication but also on how they were able to administer	Earlier identification and correction of potential errors during BSR may have improved the quality of patient care. Nurses	Through bedside shift reports as well as the elimination of chances of skipping by the oncoming nurses improved patients' satisfaction. Nurses could assess the	This study proved that implementing bedside handover resulted in a patient-centered approach. This study generated further knowledge about rural	Based on the study, the bedside shift reports also helped to promote nurses' level of accountability in their tasks besides improving the patients' experience.

improvement in patients' satisfaction.	increase in availability and degree of openness to questions between outgoing and oncoming nurses, which has been associated with	emotional and psychological needs more easily.	contributed insight into the importance of handover implementation method - areas that are not widely documented in the existing literature.	
	improved communication and quality of care.			
Lincoln & Nicole (2016)	Cairns, Dudjak, Hoffman, & Lorenz (2013)	Evans, Grunawait, McClish, Wood, & Frise (2012)	Johnstone, M. J., Hutchinson, A. M., Rawson, H., & Redley, B. (2016)	Usher, Cronin & York (2018)
Pilot Study	Non- experimental	Non- experimental	Qualitative descriptive approach	Randomized Controlled Trial
Level I	Level IV	Level IV	Level I	Level II
1B	1C	2A	1B	1A
The purpose of this evidence-based project was to increase the accuracy of communication during nursing handoff by implementing a structured approach to bedside handoff I-PASS with SAFETY to enhance patient safety and satisfaction. All RN staff	To promote a decrease in near misses, incomplete information, and zero sentinel events through involving the patient in shift handoff.	To evaluate the effect of bedside handoff reports on a nurse to nurse communication and collaboration. Sample (n=100)	To explore and describe the strategies nurses used to facilitate engagement with families of older immigrant NESB patients hospitalized for EOL care	Evaluating the Influence of a Standardized Bedside Handoff Process in a Medical-Surgical Unit
received video	bedside report	Sample (II–100)	sample of 22	performed 15

training and	was measured		registered nurses	random
attended staff	on a 23-bed		was recruited	observations
meetings where	inpatient unit.		from four	before the
evidence from the	•		hospitals in	implementation
current literature			metropolitan	of the project
was reviewed.			Melbourne and	1 3
Implementation			regional	
involved utilizing			Victoria.	
I-PASS, a			Inclusion criteria	
standardized			were holding	
verbal handoff			current	
format with a			registration as a	
written tool, and			nurse (division	
SAFETY, an			1); practicing in	
innovative			a Victorian	
bedside handoff			hospital;	
acronym, was			provided care to	
created at this			older NESB	
hospital to			immigrant	
organize bedside			patients aged 65	
handoff into a			years and older;	
consistent			admitted to	
structure with a			acute care	
checklist.			services for	
			EOL care.	
			Twenty-two	
			nurses recruited	
			to the study: 11	
			worked in	
			medical-surgical	
			wards and	
			critical care,	
			eight worked in	
			acute palliative	
			care, and three	
			worked in the	
			aged care sector.	
Compliance was	Indicators,	A pre-	The findings	An evidence-
assessed using a	including	implementation	presented in this	based project was
standardized audit	end-of-shift	survey was	article derive	performed in a
tool. Nurses were	overtime, call	distributed	from a larger	medical-surgical
surveyed for their	light usage,	among the nurses	study	unit and consisted
perceptions of the	nurse	to assess their	investigating the	of development,
new processes six	perceptions,	perception and	decision-making	implementation,
months	and the	satisfaction with	strategies used	and evaluation of
postimplementatio	change in the	the current nurse	by registered	a standardized

n. Selected	process,	shift handoff	nurses when	bedside handoff.
questions from the	impacted	process	caring for older	The project
Hospital	patient	1	immigrants of	included
Consumer	satisfaction.		NESB	surveying nurses,
Assessment of			hospitalized for	a web-based
Healthcare			EOL care, but	educational
Providers and			which could not	program, and
Systems			be considered	observations
(HCAHPS) were			within the scope	using the SBAR
evaluated			of the original	(T) competency
0,010000			report	checklist tool.
			Top or v	Data were
				analyzed for
				trends.
Based on unit-	Results	Upon	Data suggested	Independent t
level HCAHPS	indicated	implementation	that, in general,	tests were used to
data, there was a	over- time	of the bedside	the participants	compare the
50% increase in	decreases or	shift reports, the	used four key	results of the
the question	decreases	survey indicated	strategies to	MSR scale pre
"Staff Does	insignificantl	increased staff	actively engage	and
Everything to	y after the	satisfaction,	families of	postimplementati
Help with Pain," a	implementati	prioritization, and	NESB	on results
16.7% increase in	on of bedside	decreased time	backgrounds in	revealing a
the "Nurses listen	handoff	spent giving and	EOL care,	statistically
carefully to you"	reports. The	receiving a	notably:	significant
question, an 8.3%	nursing over	report.	"listening to and	improvement in
increase in the	shift time was	Additionally,	understanding	the nurses'
"Nurses, explain	reduced by 10	improved	the family,"	overall
things in a way	minutes per	communication	"encouraging	perceptions of
you understand"	day. Evidence	indicated	family members	shift report
question and an	strongly	increased	to speak first,"	preimplementatio
8.3% increase in	supported that	collaboration	"ascertaining the	n ($M = 7.31$, SD
patients' "Rating	the bedside		family's	= 1.18) versus
1 -	shift report	among nurses.	•	postimplementati
the hospital a nine	increased		decision-making model," and	on $(M = 6.60, SD)$
or ten" during the three-month pilot	nurse		"dealing with	= 1.44) of the
period. The fall	satisfaction.		angst," with the	project ($t = 2.05$,
*	saustaction.		latter	1 0
rate, although variable,				df = 55, p, .05). In addition, there
decreased 51%			encompassing the additional	was significant
				improvement in
from 6.11 per			sub-strategies of "redressing	the nurses'
1,000 patient days			naive views	
pre-pilot to 2.97				perceptions of standardized
per 1,000 patient			about the dying	bedside handoff
days over six			process" and	
months.			"dealing with	versus the usual

The authors	The authors	All the authors	intergenerational differences in values and beliefs about EOL decision-making and care EOL care, but which could not be considered within the scope of the original report. Bedside shift report was identified as an essential tool in ensuring that the families felt their loved ones were completely taken care of.	hand-off pre (M = 19.34, SD = 3.65) versus post implementation (M = 17.44, SD = 3.34) of the project (t = 2.05, df = 53.56, p, .05).
agreed that while pilot data showed global improvements in the unit, researchers concluded that it is important to focus postimplementatio n on the sustainability and hardwiring of those processes that would further improve patient experience and satisfaction on the unit.	noted some of the advantages associated with bedside shift reports, such as improved report efficiency, teamwork, nursing accountability, and report accuracy; enhanced individual patient care and documentatio n practices; satisfaction with patients being involved;	agreed that bedside shift reports resulted in increased staff satisfaction, prioritization, and decreased time spent giving and receiving a report.	appreciated several strategies, including the role of bedside shift reports, in making the patients feeling involved in the treatment process.	agreed that the project demonstrated an improvement in the nurses' perceptions of shift report. The shift report subscale suggested that nurses on the unit felt better prepared to care for their patients and perform their job following the implementation of bedside shift reports.

The success of the pilot led to the hospital-wide implementation of the standardized approach of integrating IPASS and SAFETY for nursing bedside handoff and verbal reports.	visualizing patients and the ability to prioritize care, and improved discharge or transition of care. Only three studies were found to have a sample size greater than 100 patients that directly measured the patient experience with nurse bedside shift report by distributing surveys to patients and determining that the overall patient perception of	One of the main strengths of the project was the large sample used, thereby avoiding biases of the information obtained.	A limitation of the component of the study reported was that it has had as its focus the views and accounts only of nurses involved in the EOL care of older NESB immigrant patients and their families.	Visible leadership during a shift change was a key strength of this project. Unit- based nursing leadership was available 24 hours per day to address any concerns during the trial of the new process. Unit-based nurse leaders communicated the importance of an effective bedside handoff to nurses
A	perception of the process was positive		Number	to nurses regularly during interdisciplinary rounds, staff meetings, and shift starters. Another key strength of the project was the early identification of nurses who served as change champions on various shifts.
Apart from an increase in nurse	Handoffs are dependent on	Increased staff satisfaction,	Nurses, who are at the forefront	The study identified the role
merease in hurse	acpendent on	sansiacion,	at the folenone	rachimed the fole

communication	the	prioritization, and	of caring for	of BSR in
and patient	communicatio	decreased time	patients at the	improving patient
experience, the	n style and	spent giving and	hospitals, can	satisfaction and
study also	skill of	receiving report	make a profound	in helping the
indicated the	healthcare	did not eliminate	difference in	care providers
positive impact of	providers in	the chances of	how patients and	attain the targeted
bedside shift	addition to	skipping a patient	their families	outcomes.
reports on	the	by the oncoming	experience the	
declining adverse	experience	nurse but	treatment	
events.	and	improved nurse	process. Many	
	knowledge of	to nurse	of the strategies	
	both	communication	stated in this	
	individuals	and collaboration.	study could be	
	and often	These aspects	implemented	
	result in	positively	effectively by	
	process	affected the	deploying	
	inconsistencie	delivery of	bedside reports.	
	s.	treatment care,	Aspects such as	
	Additionally,	thereby	a deeper	
	the reports	improving patient	understanding of	
	help to	satisfaction.	the patients'	
	minimize		needs and	
	sentinel		emotional	
	events.		support were	
			mainly possible	
			through the	
			reports.	

Appendix B

SWOT Analysis

Internal Forces (Project)	External Forces (Organization or
	Environment)
 Strength Knowledgeable and dedicated physicians/nurses Operational efficiency/productivity Availability of technology An abundance of resources within the organization Best practices (e.g., EBP) 	 Opportunities Improve financial viability Potential to be a Top 100 Hospital Professional development of physicians/nurses Improve patient flow and volume
 Weaknesses Increase the turnover of nurses and physicians Lack of experience from nurses and physicians Staff re-training Time constraint 	 Threats High competition from other organizations Maintaining clinical excellence and quality care Other hospitals offering higher rates of pay for physicians and nurses

Appendix C

EPRC Permission Letter

University of St. Augustine for Health Sciences Doctor of Nursing Practice Program Evidence-Based Practice Review Council 1 University Blvd. St. Augustine, FL 32086

2/26/20

Dear Victoria Ogundeko,

Your proposal titled [For hospitalized adult patients (P), does the implementation of nursing bedside handoff report (I) compared to desk handoff report improve patient satisfaction scores (O) in 2 months (T)?] has been reviewed by the University of St. Augustine for Health Sciences Doctor of Nursing Practice Evidence-Based Practice Review Council (EPRC) and determined to:

____ meet the requirements for research as defined in the Federal Register. You must adjust the proposal to reflect the DNP program requirements and resubmit for additional review. Work closely with your faculty member during this process.

_X__ not meet the requirements for research as defined in the Federal Register. Your proposal reflects an evidence-based practice change project. The proposal must be implemented as submitted (changes are not permitted). You may proceed to obtain approvals from the facility where the project will be implemented. Implementation may not begin until you are notified in writing by faculty that you may implement the project.

Questions regarding the USAHS approval process should be addressed to Dr. Douglas Turner at DTurner@usa.edu. Questions regarding the facility approval process should be addressed to course faculty.

Sincerely,

Douglas Turner

Douglas M Turner, PhD, DNP, RN, CNE, NE-BC, NEA-BC



From Dr. EM Garcia & Prof. Roland Santos

4929 Van Nuys Blvd.

Sherman Oaks, CA 91403

Email: emgarcia@primehealthcare.com rsamos2@primehealthcare.com

Date: February 04, 2020 Institutional Review Board

University of St. Augustine for Health Sciences

700 Windy Point Dr.

San Marcos, CA 92069

Dear USAHS IRB.

Permission Letter

This is to inform you that Victoria Ogundeko has been granted permission to conduct an evidence-based, quality improvement project at Sherman Oaks Hospital based on the evidence-based, quality improvement project proposal "Improving patient satisfaction score through bedside shift report." This project is to be conducted according to the ethical standards applicable to Sherman Oaks Hospital and in deliberation with the facility Internal Review Board (IRB) specification for evidence-based, quality improvement project.

The IRB will be informed promptly of any harm towards any participants of the project as a result of that individual participation in the project. The approval letter is valid for one year from the start date of project. The outcome of your evidence-based, quality improvement project is to be shared with other members of healthcare team at Sherman Oaks Hospital and a copy of the written manuscript at the facility for future reference.

For further information please do not hesitate to contact Dr. Garcia & Prof. Santos at 805-558-8560 and 818-653-0681 respectively

Sincerely,

Roland L. Sarabs, MSN, BSN, RN

Chief charsing officer

EM V, Gardio, PAD, DNP, DHEd, MSN, MBA, MAEd, APRN, NP-C, CNOR, CSSM,

FACLING FLAAN

Administrator

4929 Van Nays Blvd. Sherman Oaks, CA 91405 Phone: (818) 981-7111 Soving Hospitals. Saving Lives. Saving Jobs. A Member of Prime Healthcare

Appendix D

Project Budget

EXPENSES		REVENUE	
Direct	\$120	Billing	\$130
Salary and benefits	\$0	Grants	\$40
Supplies	\$80	Institutional budget support	\$300
Services	\$10		
Statistician	\$500		
Stationery	\$20		
Transportation	\$50		
Indirect	\$60		
Overhead (electricity, etc.)	\$10		
Total Expenses	\$850	Total Revenue	\$470
Net Balance = \$380			

Appendix E

Schedule

TASK	DATE		
Nursing EBP project review council at	02/30/20		
USAHS approval			
Approval letter from the facility	03/30/19		
Meeting with key stakeholders	04/03/20		
Project Design	04/17/20		
Structure and conduct staff training	05/12//20 - 06/12/20		
Implementation and data collection	06/14/20 - 07/14/20		
Data analysis and dissemination of results	07/16/20 - 08/14/20		

Appendix F

In-Patient Assessment of Healthcare [I-PAHC] Survey

Survey # Hospital Name: Department:	Ward:			
Age: Date:				
Male \square_1 female \square_2	Never	Sometimes	Usually	Always
 During this hospital stay, how often did <u>nurses</u> treat you with courtery and respect? 	2□	2□	₃ □	۵,
During this hospital stay, how often did <u>nurses</u> listen carefully to you?	,0	ı.	,□	.0
3. During this hospital stay, how often did <u>nurses</u> explain things in a	-0	,0	.0	۵
way you could understand? 4. During this hospital stay, how often did doctors/health officers treat	,0	-,0		Д
you with courtesy and respect? 5. During this hospital stay, how often did doctors/health officers listen				
carefully to you? 6. During this hospital stay, how often did doctors/health officers	,D	10	,□	,0
explain things in a way you could understand?	,0	,0	,0	.0
I could distinguish between doctors/health officers and nurses.	₇ D	70		.0
8. During this hospital stay, how often was the room you were sleeping in kept clean?	,0	2□	,□	ο,
During this hospital stay, how often was the area around you quiet at night?	,□	η	эП	ω,
 During this hospital stay, how often did staff make sure you have enough personal privacy? 	₂ □	ı_	ı□	.0
11. During this hospital stay, did you experience any pain?	, ☐ Yes .☐ No, Skip 12 & 13			
12. During this hospital stay, how often was your pain well controlled?	,0		ıΠ	.0
13. During this hospital stay, how often did staff do everything they could to help you with your pain?	,0	₂ □	ı,□	,0
14. During this hospital stay, were you given any medication that you had not taken before?	, □ Yes □ No. Skip 15 & 16			
15. Before giving you any new medication, how often did staff tell you what the medicine was for?	,0	,0	,□	,o
16. Before giving you any new medication, how often did staff describe possible side effects in a way you could understand?	η	₂ □	,□	.0
17. Were you given information in a way you could understand what symptoms or health problems to look out for after you leave the hospital?	ı□ Yes	₂□ No		
18. Was it easy to find your way around the hospital?	.□ Yes	-□ No		
19. Is this your first time being treated at this hospital?	Ves No Cannot remember			
20. On a scale of 0-10 (0 being the worst hospital, 10 being the best				
hospital), how would you rate this hospital?	0 1 2 3 4 5 6 7 8 9 10			
makes from many language and makes	Worst hospit	zł		Best hospital
21. Would you recommend this hospital to your friends and family?	-0	.0	-0	.0
	Definitely	Probably no	Probably	Definitely
	no	r rosesty no	yes	yes
22. Did you have to pay for this hospital stay?	₁□ Yes	₃□ No, Skip C	(23	
23. Do you consider this hospital stay too expensive?	₁□ Yes	₂ □ No		
24. How would you rate your overall health?	₁□ Poor	₂□ Fair	₃□ Good	₄□ Excellent
25. What is the highest grade or level of school that you have completed?	□ Illiterate □ Reading & writing ability, no formal education □ 1"-8" grade □ 9" - 12" grade □ Diploma and above □ Other			

Permission to use this tool I-PAHC survey for the project was granted by the author, Dr. Bradley, on May 28, 2020.