8-8-2022

Audit And Feedback For Blood Glucose Point Of Care Testing

Faith A. Onwuka
University of St. Augustine for Health Sciences

Follow this and additional works at: https://soar.usa.edu/scholprojects

Part of the Critical Care Nursing Commons, Family Practice Nursing Commons, and the Other Nursing Commons

Audit and Feedback for Blood Glucose Point of Care Testing

Faith Onwuka, MSN, FNP-BC, APRN

School of Nursing, University of St. Augustine for Health Sciences

This Manuscript Partially Fulfills the Requirements for the Doctor of Nursing Practice Program

and is Approved by:

David Liguori, DNP, NP-C, ACHPN

Monica Donald, DNP, RN

Approved: August 8, 2022

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

Student Last Name: Onwuka	First Name: Faith	Middle Initial: A

E-mail: f.onwuka@usa.edu		

Title of DNP Project:

Audit and Feedback for Blood Glucose Point of Care Testing

My signature confirms I have reviewed and approved this final written DNP Scholarly Project.
DocuSign electronic signature or wet signature required.

Type Name in Blue Box Below	Signature	Date
DNP Project Primary Faculty: David Liquori, DNP, NP-C, ACHPN	▮▮▮▮▮▮▮	8/8/2022
DNP Project Preceptor: Monica Donald, DNP, RN	▮▮▮▮▮▮▮	8/8/2022
DNP Project Preceptor:		

Abstract

Practice Problem: Patient identification errors in point-of-care testing (POCT) is responsible for test results being missed or transferred to the wrong patient's chart. A hospital in Los Angeles County experienced a 50% compliance rate in patient barcode scanning prior to blood glucose POCT which affected the delivery of care.

PICOT: The PICOT question that guided this project was: Among emergency room nursing staff (P), how does the implementation of audit and feedback (I), when compared to random observations (C) improve compliance of patient identification with barcode scanning before performing blood glucose check (O) within ten weeks (T)?

Evidence: The evidence suggests that the implementation of an audit and feedback system decreases patient identification errors and improves staff compliance with POCT policies and procedures.

Intervention: The intervention utilized for the change project was an Audit and Feedback system whereby nursing staff were monitored for their compliance in the proper identification of patients through scanning patients' identification bands prior to blood glucose POCT. Feedback was provided to highlight any errors in patient identification.

Outcome: The project results demonstrate an increase in the rate of compliance from 50% to 83% after the implementation of audit and feedback.

Conclusion: The results of this project replicated the literature findings that the use of audit and feedback improve nurses' compliance with barcode scanning prior to performing POCT. The findings of the project were very beneficial to the hospital, as they strive to provide the best patient care.

Audit and Feedback for Blood Glucose Point of Care Testing

Point of care testing (POCT) is a form of testing in which the analysis takes place close to where the patient is physically located, usually at the patient's bedside (Shaw, 2016). There are multiple benefits associated with POCT. Consequently, it is popular in both outpatient and in-patient settings. A benefit of POCT is that it provides a faster test result than the test performed at the central laboratory (Shaw, 2016). POCT also facilitates a quick clinical and potentially life-saving decision-making process. This quick decision-making ability promotes quicker plans for home discharge. In addition, POCT usually requires less sample volume than similar tests performed at the central laboratory where blood draw may be required (Estock et al., 2018). It is therefore not surprising that POCT is the preferred test at various health care facilities. In 2022, the global diagnostic market for POCT will reach 40.50 billion (Lingervelder, 2019). This excellent market for POCT adds to the assertion that it is a well-accepted form of test and a standard for patient care in a variety of health care settings.

Blood glucose measurement is an example of a POCT used to monitor glucose levels of patients with or without diabetes. The effectiveness of blood glucose results is based on the accuracy of the test. However, maintaining the quality and accuracy of results when performing POCT requires proper patient identification. Improving the accuracy of patient identification has been identified by the Joint Commission as a patient safety goal for 2021, thus underscoring its importance (The Joint Commission, 2021). This goal will ensure that the patient gets the proper treatment and medicine.

As cited in Shaw (2016), 300,000 POCT were performed annually by approximately 2,400 clinical operators in Pittsburgh's Baystate health system. The volume of POCT that occurred and the associated potential errors emphasized the need for patient barcoding before

blood glucose checks. These potential errors include the use of the wrong patient identification. A wrong patient identification increases the risk of utilizing the blood glucose result of one patient for another (Snyder et al., 2012). In this case, the first patient might receive the treatment meant for another person. An audit of the Baystate health system showed that their glucometer operators did not confirm patient identifiers for 45% of the POC tests performed at Pittsburgh's Baystate health system (Shaw, 2016). Other errors identified in the study was not scanning patients' barcodes before checking their blood glucose. As cited in Shaw (2016), an audit of POCT glucose results reported that approximately 30% of results were not correctly written in the patients' charts. This study found that 12% of POCT glucose results were not recorded in the patient chart at all (Shaw, 2016). These reports emphasize the importance of consistently scanning patients' barcodes before checking their blood glucose.

Barcode scanning helps automate and potentially reduce the preanalytical errors caused by manually entering patient data (Price et al., 2018; Shaw, 2017). Therefore, improving compliance with policy and best practices is the motivator for barcoding patients before blood glucose checks. Unfortunately, the compliance rate with scanning patients before a POCT remains an ongoing issue in many healthcare settings (Liikanen & Lehto, 2013). This is also an issue at the facility where this project was implemented,

Audit and feedback is a strategy that encourages clinicians to make changes to their clinical practice. Accordingly, a clinician who receives information showing inconsistencies in their clinical practice will be motivated to improve. Audit and feedback is beneficial in enhancing staff compliance when following evidence-based practices and care protocols (Whalen et al., 2021). Additionally, it helps sustain practice changes in various clinical settings.

The project aims to increase the nurses' level of compliance in patient barcode scanning prior to POCT measurement of blood glucose.

Significance of Practice Problem

Diagnostic testing including POCT is very important in any setting where patient care is provided. POCT is key for obtaining valuable insight for quick decisions regarding treatment and referral (Lingervelder et al., 2019). To obtain the benefits of point of care tests, there must be the implementation of a quality assurance program. The quality assurance program will secure the accuracy of POCT results and maintain patient safety. POCT errors are problematic because instant medical actions are usually based on the results seen (Alreja et al., 2011).

In a study by Alreja et al. (2021), 19,269 glucose POCT were performed, and results demonstrated that 61.5 patient ID errors occurred on a monthly basis. This is an error rate of 0.319%. Errors in the data entry of patient identification (ID) can cause POCT results to be entered in the wrong patient's chart. This can not only affect patient care, but it can also impact both billing and compliance issues especially if there is no active patient account.

Studies show that implementing barcode scanning before checking a patient's blood glucose has reduced errors associated with glucometer use (Estock et al., 2018). Consequently, improving compliance with patient identification policy and best practices is the motivator for barcoding patients before blood glucose measurement. However, it seems impossible to attain zero error with barcode scanning because POCT device operators are not consistently scanning patients before performing measuring blood glucose (Liikanen & Lehto, 2013). At the project site facility, the emergency room nurses are responsible for the errors and fallouts associated with non-compliance with patients' barcode scanning. Therefore, an audit and feedback program was needed to increase the nurses' compliance with scanning patients' barcodes before

performing a POCT. Audit and feedback are useful strategies for implementing and sustaining practice changes anywhere patient care is provided (König et al., 2013).

PICOT Question

The PICOT question that guided this project was: Among emergency room nursing staff (P), how does the implementation of audit and feedback (I), when compared to random observations (C), improve compliance of patient identification with barcode scanning before performing blood glucose check (O) in ten weeks (T)?

The emergency room nurses in this facility were the targeted audience for the project. These nurses have the primary responsibility of checking the patients' point of care glucose level. An audit and feedback program was the intervention that was implemented in this project. It is a strategic tool that promotes compliance to nursing practices in various healthcare settings (König et al., 2013).

Random observation is the comparison of the project intervention. Random observation entails checking in on nurses, without notice, during blood glucose measurements to see if they are remaining compliant with the policy of the facility. Random observation is a strategy used to increase compliance with medical practices (Hagel et al., 2015). It could involve constant observation of the performer, which may not always be feasible (Diefenbacher et al., 2019).

The expected project outcome was to evaluate the efficacy of audit and feedback on the rate of compliance to scanning a patient's barcode before blood glucose measurement. The estimated time frame for this project was ten weeks.

Evidence-Based Practice Framework & Change Theory

The evidenced-based practice framework was the John Hopkins Evidenced-Based Practice Model (JHEBM) (Schaffer et al., 2013). This practice model represents the three steps that guides practicing nurse to practice change based on evidence (Schaffer et al., 2013). The first step is to identify the practice question. Recognizing the practice problem was achieved by understanding the facility's needs. The needs of the facility were identified through a needs assessment.

The second step of the JHEBM is identifying the best evidence to answer the PICOT question (Schaffer et al., 2013). At this stage, the evidence obtained during step one was reviewed. The John Hopkins appraisal tool was utilized to review the literature and evidence on the practice problem. This tool was used to evaluate the strength and quality of each study (see Appendices A and B).

The last step of the JHEBM entailed the implementation phase of the project (Schaffer et al., 2013). The evidence from the previous stage was translated into a practice change. An action plan was created that included obtaining the necessary support and resources for implementation. Next, the action plan was implemented. After that, the outcomes of implementation were evaluated and reported to the stakeholders at the facility.

In addition, Kotter's 8 step change model was the selected change model for this project (Friesen, 2016). This model illuminated the steps and key processes for creating a lasting change in any sector. The main goal of this project was to improve the nurses' rate of compliance to scanning patients' barcodes before blood glucose measurement. Kotter's change model provided the framework needed for creating sustainable change. It presented the necessary steps of implementing a change process (Friesen, 2016). This model was successful in various research

studies (Winslow et al., 2016). The Kotter's eight steps of change are creating a sense of urgency, building a guiding team, creating a vision for change, communicating the vision, enlisting a volunteer army, removing obstacles, creating short-term wins, keeping change going, and making change stick (Winslow et al., 2016).

Evidence Search Strategy

For the search process, keywords used were "point of care test," "audit and feedback," "audit," "feedback," "compliance," "barcode scanning," "patient identification." The inclusion criteria included "nursing staff," "point of care test," "rapid test," "audit and feedback," "articles within the last ten years," "systematic reviews" and peer-review articles." In addition, exclusion criteria included "articles that were not directly related to POCT" and "non-systematic review articles." The MeSH headings used in the proposal included "point of care testing" and "audit and feedback."

Databases searched included ProQuest, PubMed, CINHAL, Google scholar, Ovid and Cochrane Library. Furthermore, two Boolean operators: "AND" and "OR" were used in the search. The search resulted in phrases such as "point of care test" AND "patient identification," "point of care test" and "patient identification," "barcode scanning," OR "point of care testing." During the search, keywords such as audit and feedback were rearranged to ascertain additional studies. The rearrangement of subject terms resulted in different articles with each search. The use of "OR" instead of "AND is preferred. "OR" broadened the search and yielded a high number of results. The "OR" also helped to connect two or more similar words, ideas, and concepts (Portney, 2020).

One of the challenges in the search was finding primary articles on the topic. Several of the searches yielded secondary articles. However, looking at the reference section of those

secondary sources provided additional information. Other searches resulted in systematic reviews of various articles instead of primary articles on the topic. The initial limitation in the search result initiated the need for searching more databases. Furthermore, the selection of full-text articles in the search strategy also limited the results received. Consequently, full-text articles were removed from the search criteria to increase article choices.

Evidence Search Results

The initial search on CIHNAL, using the listed keywords, such as "point of care test," "audit and feedback, "blood glucose check," yielded 2337 articles. Ovid database, on the other hand, using "point of care test," "audit and feedback, yielded 5,143 articles. Using Pubmed "barcode scanning" "audit and feedback yielded 3,435 articles. SearchUSA yielded 14,051 articles for keywords, "audit and feedback" and "nursing staff."

In addition, after removing duplicate articles, 45 articles remained. With the application of inclusion and exclusion criteria, 30 articles were removed. This process resulted in 15 remaining articles. Next, full-text screening was performed, narrowing the remaining articles to 11. After data extraction, an additional 3 articles were removed from the list. This process resulted in 8 articles at the end of the evidence search (see Appendix C).

Regarding the level of research, the literature review showed the articles graded as Level I and Grade A from the Johns Hopkins Nursing Evidence-Based Practice. The evidence level and quality guide showed the best evidence-based literature because it consisted of mainly systematic reviews. The other grade level utilized included grade level 2 and grade level 3 of evidence.

Themes And Practice Recommendations

Lingervelder et al. (2019) examined the relationship between barcode scanning and the elimination of mistakes in laboratory testing and identification errors. The article recommended barcode scanning with laboratory specimens to prevent mistakes with patient identification. This article included a meta-analysis of 17 observational studies. Barcode scanning was considered a best practice in the clinical setting, given the high quality of evidence supporting it. However, the study was limited to a hospital setting. There was no evidence, however, that the recommendation would be applicable in non-acute or outpatient settings.

Whalen et al. (2021) identified a relationship between audit, feedback, and the improvement of compliance to an evidenced-based practice such as scanning of patient barcodes. One of the emerging themes is the timing of the feedback. The authors recommended that the result from the audit is shared with the individual nursing staff within 72 hours after the audit takes place. When the audit result is discussed immediately with the nurse, it makes it easier for the nurse to remember the audit scenario. Feedback given shortly after an audit, as opposed to prospective or retrospective feedback, has also been proven to yield a greater level of adherence to guidelines (Whalen et al., 2021).

All the studies were concerned about the sustainability of the practice change after implementing the intervention. The goal of audit and feedback intervention is to increase the nurse's compliance to scanning patients' barcoding before performing a POCT. However, it was mentioned that the nurses' rate of adherence to scanning patient's barcode declined after the implementation of audit and feedback as an intervention (Hutchinson et al., 2020). As a result, there was a need for sustainability of the change process after the implementation of the intervention.

A proposed strategy for dealing with the problem of sustainability lies in the knowledge of what drives someone to change. The Lewis behavioral change theory explains what motivates a person to change. This knowledge guides us on how to use audit and feedback to influence a person's behavior. According to Lewin's behavioral change theory, people will change if they see the need for it (Tuyet, et al., 2020). To make this intended change sustainable, nurses will need education on the benefits of scanning patients' barcodes before performing a glucose POCT. One of such benefits is patient safety and reduced errors. The reduction of errors can profoundly affect the organization's finances. An organization can lose substantial revenue due to potential lawsuits from mistakes from not scanning a patient's barcode before a blood glucose check.

Another theme that emerged from the research was the lack of evidence to support an individualized audit and feedback strategy in nursing practice. There was a consensus regarding the lack of consistent and generalizable positive impact of audit and feedback on the nursing population (Whalen et al., 2021). Hence, the recommendation for further research to be performed on the subject of audit and feedback. An additional recommended area of research was the need for a cost-effective way to provide audit and feedback because individualized audit and feedback has been demonstrated to be time-consuming, labor-intensive, and costly (Jolliffe et al., 2019). Such is especially true when the nursing staff is large and the implementation period lasts for a few months (Borgert et al., 2016). The recommendation is to conduct a team-level audit and feedback strategy instead of an individualized audit and feedback system (Borgert et al., 2016).

Reynolds (2020) demonstrated that audit and feedback was an effective strategy for promoting clinical practice guidelines. The author suggested that measures be taken so the

feedback component of the intervention is not lost in the process. A verbal or written feedback ensures that the feedback component is evident to the intended audience. In a separate study, Whalen et al. (2021) suggested to include the action plan or the expected outcome in the feedback component to eliminate confusion. Furthermore, research illuminated yet another recommendation, namely that the individual providing the feedback be known to the nurses (Reynolds, 2020). This individual can either be a peer or a supervisor (Reynolds, 2020). This suggestion was implemented in this project.

<div style="text-align:center">Setting, Stakeholders, and Systems Change</div>

Setting

The organization is an acute care facility with a bed capacity of 237. This facility is located in the city of Long Beach, California. It offers both emergency and in-patient care. The use of a glucometer to measure the patient's blood glucose level took place in all the units of this facility. Furthermore, non-compliance with patient barcoding before glucose measurement was also identified as a practice problem. Of note, the emergency room had the highest rate of non-compliance compared to the other hospital units. This may be related to the high rate of POCT testing orders. Consequently, the implementation of this project focused on the emergency room. The patients who were included in the project had an existing order for random blood glucose checks. On the other hand, patients with other forms of POCT were excluded from the project.

The mission of this facility is to offer timely and quality services for their patients through care with respect for one's physical, psychological, and spiritual well-being. The organizational leadership structure of this institution included a Medical Center Director and a deputy medical center director. There is a chief nurse executive and director of patient care. There are different managers heading various departments and units such as quality and safety,

risk management, human resources, and patient care services. The atmosphere at this facility was both positive and friendly. In addition, the employees of this institution were always willing to help each other. The project stakeholders included the chief nursing officer, the risk, quality and emergency department managers, the emergency department nurses, patients, and the patient's families

The issue of non-compliance in scanning a patient's barcode before performing a blood glucose measurement remained an ongoing issue at this facility. A lack of a sense of urgency contributed to non-compliance. Staff members were not always compliant with best practices or policy requirements. This facility fostered a culture of not holding employees accountable for non-compliance with protocols and policies. An example is the case of scanning patients before obtaining their blood glucose levels. Despite the policy mandate, nurses were found to be non-compliant. This underscored the urgency and the importance of this project in addressing the issue of non-compliance and patient safety. It is worth mentioning that leadership was aware of the atmosphere of nonchalance and are actively investigating strategies to address and mitigate the issue.

Swot Analysis

The purpose of a SWOT Analysis helps in identifying strengths and weakness of a practice environment (Dahl, 2021). It considers the strengths, weaknesses, opportunities, and threats of an organization. These factors are critical to the long-term survival of an organization. One of the internal strengths of this organization was strong and collaborative leadership. The leadership was composed of staff who were experienced and knowledgeable. The support of the administration was sustained throughout the implementation of this project. In addition, the proposed benefits of this project were expected to impact the whole organization positively.

Strong financial stability was another strength of the organization. The facility had affiliations with the federal government and also had substantial financial resources. This is a potential advantage for the implementation of this project both at the emergency room and also in the rest of the facility.

Regarding the weakness of the organization, there was a laid-back atmosphere. The current culture of the organization fostered nonchalance. The staff members believe that there is no accountability for their actions; and therefore, will not experience any consequences.

An organization's opportunities are the external factors that present areas of growth. An example of an opportunity is the diverse and talented group of employees that work at this facility. These employees can be trained in new ways of doing things. They can also quickly excel in their various departments. With the nature of the employees at this facility, the chances of this project succeeding were high. Another organizational opportunity was the availability of resources that can be allocated for the implementation and sustainability of this project.

The last part of the SWOT analysis are the threats. These external factors need to be monitored not to sabotage the project and the organization. A negative staff perception at this facility was an example of a threat to the organization. Outsiders believed that the employees were very laid back and non-compliant. There are also an increasing number of lawsuits from patients when they are not satisfied with the level of care they receive. These were all potential threats to the organization.

System Change

The implementation of this project brought a change at the unit level and the facility/hospital level. The emergency room currently had the highest level of fallouts and incidences. There was a change in culture and the rate of non-compliance with the

implementation of this project. In addition to the emergency room, other units where POCT blood glucose measurement took place implemented the intervention. These units also experienced non-compliance resulting from not scanning patients before checking their blood glucose levels. A positive impact from this project could potentially result in a positive effect on other units where blood glucometer checks occurred. This positive impact translated into money the facility could potentially save.

Implementation

Objective

The first step of the implementation process was to obtain approval from the University of St. Augustine Evidenced-Based Practice Project Review Council (EPRC). The following entity is the institutional review board (IRB) at the practicum site. The primary objective of this project was to increase the nurses' compliance rate to barcode scanning before patient's blood glucose measurement, using an audit and feedback program in ten weeks. The Doctor of Nursing Practice (DNP) student observed the nurse performing the glucose check to ensure that the nurses were compliant with policy and procedure. This formed the audit part of the intervention. At the time, when the nurse was audited for compliance, the nurse also received initial feedback about whether the nurse was compliant or not with the policy of proper patient identification before the measurement of blood glucose. If the audit was positive for compliance, education on the importance of patient barcoding was provided to the nurse immediately.

The second objective of this project was to have a 100% compliance rate in the staffs' compliance to the facility's policy of scanning a patient's barcode before checking their blood glucose. This will reduce the rate of patient misidentification associated with not scanning a patient's barcode before checking their blood glucose. The time frame for the achievement of this

objective was ten weeks. The project manager monitored the compliance rate to the policy of scanning patients before checking their blood glucose. The audit was conducted bi-weekly with direct observation by the project manager.

Furthermore, the third objective was the sustainability of the project. This project aimed to keep the practice change sustainable beyond the ten-weeks implementation period. A way to ensure practice sustainability was to include the process in the facility's policy (König et al., 2013). The current policy required nurses to scan the patients before measuring their glucose. However, the policy could be adjusted to include the need for monthly audits and feedback to monitor and increase the rate of compliance to the given policy. Audit and feedback positively impact the implementation and sustenance of practice changes, especially when the audit is recurrent (Reynolds, 2020).

Kotter's Change Model

Concerning Kotter's change model, the first step was to create a sense of urgency. This was based on the current issues seen from the high rate of non-compliance to the evidenced-based practice of scanning patients before checking their glucose. The high rate of non-compliance to patient barcode scanning before glucose check and the near misses resulting from non-compliance formed the basis for urgency for this project. Next was to build a guiding team. This guiding team included key stakeholders such as the laboratory personnel handling point of care testing, the quality department, members of the administration, and the nurses. The next step was to create a vision for change. The goal was to create a vision that everybody would buy into. The vision of the project was in alignment with the vision of the company, which was to provide their patients with world-class benefits and services by complying with the highest standards of compassion, commitment, integrity, excellence, professionalism, accountability, and stewardship

(US Department of Veterans Affairs, 2021). The next step was to communicate the vision. The goal was to communicate this vision in a language that the participants and other stakeholders would understand and relate to. The project's vision should express the heart of the project, which was to increase the rate of patient barcoding before glucometer check using audit and feedback.

The next step was to enlist a volunteer army. The army included people who would improve this project and move it forward. The members of this army included the nurse unit champions, family members, nurses, and various leaders. Furthermore, future obstacles were proactively handled by planning for unforeseen issues and future obstacles that might come up. An example of a potential obstacle is the nurses' anticipated resistance to change. Potential obstacles can be handled by educating the nursing staff on the benefits of scanning a patient's barcode before checking their blood glucose. By preempting these obstacles, strategies were put in place to overcome the obstacles before they came up. Next step was to create short-term wins. This entailed celebrating any kind of achievement/ wins, such as a noticeable increase in the rate of compliance to patient barcoding. This celebration acted as a form of encouragement to other project participants. Celebration is based on the principle of positive reinforcement. The celebration of short wins acted as a reinforcing stimulus following compliance to scanning patients' barcodes before glucose check. Such celebration made it more likely that the behavior would occur again in the future (Solomon, 2019).

The next step of the Kotter's change model was to sustain the acceleration. This kept the change going. Key stakeholders, such the nursing staff, who were positively making advancements in the project, were rewarded. The final step was to make the change project sustainable. After implementing the change project, the next step was to make every possible

effort to make sure the change remained sustainable. Sustainability meant that there was a continuation of barcode scanning before any blood glucose check by the nursing staff at this facility after implementing this project.

Project Details

The DNP student project manager took the lead role for this project in collaboration with the Emergency room manager, the laboratory personnel, and the quality manager. A key person in this project was the DNP student's preceptor, the risk manager. This risk manager helped identify the current problem as a change project. The DNP student assisted in the performance of audits few times a week for four weeks. The audit tool included a questionnaire with the nurse's first name only, the date, the shift, and whether the nurse scanned the patient before performing a blood glucose measurement. The goal was to protect the privacy of the nurses, by using only their first name. In the event that there were two nurses with the same first name, then the first initial of the last name was included for faster identification. The DNP student had the audit tool during nurse assessment to help facilitate the audit process. A total of 41 emergency room nurses were audited in real-time, at different shifts, over four weeks. It was important to capture the various shifts the nurses worked at the emergency room. The audit's goal was to obtain the level of compliance to the policy of scanning the patient barcode before checking their blood glucose. The project's data collection tool is in appendix D.

The next step was the feedback component. The DNP student was the first to relay the feedback to the nurses, verbally. As cited in Hutchinson et al., (2020), there is a positive relationship between the timing of the feedback and the impact on the proposed outcome. As the DNP student gave the oral feedback, nurses who were not compliant was educated on the need for proper patient identification. In addition, the nurses received feedback from their managers.

The role of the nurse manager as a leader on the unit helped to increase the nurses' receptivity to the feedback (Jolliffe et al, 2019). The ER manager relayed the audit findings to the nurses within 48 hours of receiving the audit results from the DNP student. The nurses' feedback from their manager was in a written form. It had the nurse's name and whether they complied with the unit policy based on the conducted audit. At the end of this brief feedback session, the nurses signed the written feedback. After signing, a copy of the feedback was given to the nurse. An increase in the compliance rate of patient barcoding before each blood glucose check was expected after implementing the intervention.

The power of audit and feedback as an intervention tool is best represented as a cycle. It started with a review of current clinical practice. A collection of the data before the introduction of the intervention showed the current rate of non-compliance. Next in the cycle was the setting of standards for care. The setting of standards occurred before the introduction of the intervention. Next was the monitoring of practice against these standards. This audit as a monitoring tool helped highlight the current practice at the facility. The final step was the analysis of findings. This consisted of comparing the pre-intervention and pre-intervention data of the rate of compliance to patient barcode scanning before a glucometer check. The data comparison was used to evaluate the impact of audit and feedback on the rate of adherence to patient barcode scanning before blood glucose measurement.

Budget

The goal was to bring the expenses of this project to a minimum. A way to reduce cost was to utilize the DNP student to debrief the nurses, educate them on the policy, and perform audit and feedback. There were no plans to use staff outside the facility. This helped to keep the expenses to a minimum (Table 1).

Results

The aim of this project was to measure the compliance rate of emergency room nurses to the practice of scanning a patient's identification band prior to checking their blood glucose. The purpose was to evaluate if the intervention of audit and feedback made any impact on the compliance rate. The project's group participants included the Emergency room nurses at the project facility. The nurses have the primary responsibility of checking the patient's blood glucose.

A detailed project proposal was developed and submitted to The University of St. Augustine for Health Sciences' EBP Project Review Council (EPRC). After approval was obtained, implementation of audit and feedback intervention took place over a ten-week period. During the implementation process, feedback served as both an educational and a reminder tool for the project participants to consistently scan the patients' identification bands prior to measuring their blood glucose.

Data Collection

Data regarding the patient's glucose was transmitted multiple times a day from the glucometer base directly to the laboratory. The data became available to the ancillary test coordinator as the glucometer was placed in the glucometer base. This data from the glucometer was transmitted to the laboratory department multiple times a day. The lab department also had first access to the project data before any other department.

An ancillary testing coordinator (ATC) captured the data for the rate of compliance in scanning patient barcodes before a blood glucose check. After data review, participants who were non-compliant cases were reported to the ER manager. Next, the nurses who were not compliant with the procedure of scanning the patients before measuring their blood glucose were

instructed to input the correct patient identifier. No further action was required if the nurse made the correction. However, if no corrections were made, the ATC enters the non-compliant cases into the internal data reporting system for further review.

HIPPA was maintained at all stages of the project. Measures were taken to ensure that unauthorized users did not have access to the data. Data was stored in a secured and locked location to prevent data breaches. Data storage was performed by the ER manager and the project manager throughout the duration of the project, whenever data was collected.

Data Analysis

Pre-intervention and the post-intervention data were analyzed using Intellectus Statisticus. A two-tailed one-sample t-test was used to compare the rate of compliance of scanning the patients' barcode before measuring the patient's blood glucose. The data provided the opportunity to evaluate the effectiveness of the audit and feedback intervention that the nurses received.

Statistical Analysis

A two-tailed one sample t-test was used to compare the level of compliance after the audit and feedback intervention. Although the results were not statistically significant ($p = 0.102$) the project demonstrated clinical significance. The overall compliance rate increased from a baseline of 50% pre-intervention to 83% post-intervention. This demonstrates the efficacy of audit and feedback as an intervention. The result of this statistical analysis is presented in table 3.

Outcome

The current rate of compliance for patient barcode scanning at this facility is among the nurses is currently about 50%. The goal of the project was to raise the level of compliance to 100%. After the implementation of audit and feedback, the rate of compliance was noted to

improve from 50% to 83%. While this is below the goal rate of 100%, it is still an improvement from the starting rate of compliance.

Financial

The financial benefits that come from this project being successful include the reduction of patient identification error with barcode scanning. The project reduced the incidences of having the wrong patient result being entered in the patient's chart. The occurrence of POCT errors creates costly problems for the organization since immediate treatment is normally ordered for the patient, based on what is entered in the medical record. The project reduced such occurrences from happening. There will be a notable POCT error reduction over time with consistent use of barcode implementation (Alreja et al., 2011). This translates into monetary savings for the facility. Without patient barcoding before a glucometer check, there is a higher chance that the wrong patient will receive the treatment meant for someone else. In addition, having a successful project eliminates the occurrence of compliance issues, which arises from the inability to bill a chart due to patient identification error (Liikanen, E., & Lehto, 2013).

Sustainability

A high rate of non-compliance to patient barcode scanning after this audit and feedback intervention, the use of another form of intervention might be necessary. However, there is an increase in the compliance rate from 50% to 83%. One strategy for sustaining this project is to continue a weekly audit and feedback of the nurses when they are performing the glucometer check. The staff will be more receptive to doing the right thing once they know that they will be held accountable for their actions. Health workers' motivation can impact health services delivery (Stefan et. al, 2020). Hence, the need to adopt some key points from Maslow's theory of

need hierarchy to motivate the nurses at this facility. In addition, the feedback component of the intervention shows the nurses how they are doing and the areas that need improvement.

Impact

The goal of this project was to improve the compliance level of emergency room nurses to patient barcode scanning, before glucometer check. The measured outcome showed that there was an increase in compliance level, after the use of audit and feedback. The implementation of audit and feedback was useful in implementing a practice change as opposed to the use of random observation (Borgert et al., 2016).

In addition, the intervention of feedback and audit can now be introduced to other departments at this facility where compliance to patient barcoding is a problem. This is based on the success of this project at the site emergency room. Throughout the project site, nurses have not been compliant with scanning the patient's barcode before checking their blood glucose. With the recorded increase in compliance rate at the emergency room, the intervention can be introduced to the other departments at the project site.

Regarding the sustainability of this outcome measure, an ongoing audit and feedback to maintain a high compliance rate. The sustainability of the project is necessary after the implementation comes to an end. There is a positive correlation between the intervention and the project outcome. Without a periodic audit and feedback, sustaining the project outcome could be challenging (Reynolds, 2020). Consequently, there is a need for either a monthly or quarterly audit and feedback, to ensure that the compliance rate of patient barcoding before glucometer check does not decrease over time. Another option is to collect more data in few months or a year, to see if their compliance rate is about the baseline of 50%, with no audit and feedback.

Limitation

The intervention of the project was only implemented in the emergency room department. However, the problem of non-compliance with patient barcoding before glucometer check is paramount in all the units in this facility. The emergency room is a small part of the hospital where patient care is delivered. The emergency room nurses are also a small participant size, as compared to all the nurses at this facility in other departments, who perform blood sugar checks. Consequently, the findings are not generalizable.

Implementing this feedback on a large number of people is costly. The participants of this current project comprised of only the emergency room nurses. To apply the outcome of this project to the broader facility, provisions need to be made to cover the cost of a timely audit and feedback.

Dissemination Plan

The project's outcome was disseminated in the form of a presentation. The presentation tools included Microsoft PowerPoint, storyboards, and posters. The audience for this presentation were the emergency room nurses, laboratory personnel, and the quality department manager. The process of dissemination is crucial to sustaining the change project. When the outcome and the results of the projects are properly disseminated, it helps others to truly understand the task (Harris et al., 2018). The presentation was organized and written out in a simple format, to prevent any confusion. The Emergency room unit champions oversaw the posters during the presentation at staff meetings. The poster presentation allowed staff members to follow along at a comfortable pace.

In addition, the project publication will be shared at the regional and national levels. Several organizations, such as the American Nurses Association (ANA) have both regional and

national chapters. This manuscript will be submitted for consideration in various organizations to get the message of this project out to other healthcare practitioners. In addition, the outcome will be disseminated in medical conferences across the country, such as Pri-Med and Medscape conferences.

Furthermore, there are plans to submit the manuscript to the American Journal of Medicine. The journal is based in the United States, and it is well-read by the medical community. Peers will review this publication. Furthermore, the goal is to follow the guidelines that have been set forth by the American Journal of Medicine to increase the chances of acceptance for this publication. The manuscript will also be submitted to the Scholarship and Open Access Repository website at the University of St. Augustine for Health Sciences (SOAR@USA).

Regarding the sustainability of this project, the result of the project were shared with the project participants and the stakeholders. This will advertise the positive results of this project and ensure its sustainability. Furthermore, the sustainability rate can be predicted using the level of project acceptability at this facility (Portney, 2020). A favorable attitude from the nurses and members of the administration towards the project will help ensure sustainability long after the implementation phase (see Appendix E).

Conclusion

The purpose of this project was to apply an evidenced-based practice intervention to reduce the rate of patient misidentification during glucometer checks in the emergency room. Glucose point of care testing is a widely used and efficient strategy to measure a patient's blood sugar in various clinical settings. However, there are risks associated with this point of care testing if the patient is not properly identified. The use of audit and feedback has been effective

in adopting and implementing evidence-based practices among clinicians. The evidenced-based

model used in this project is the John Hopkins evidenced-based theory model. In addition,

Kotter's change theory was adopted to express the various steps included in the change process.

Databases such as CINAHL, PubMed, and SearchUSA were used for the literature search. Based

on the result of this project, audit and feedback increased the compliance rate of the emergency

room nurses from 50% to 83% in scanning the patient's armband before performing a glucometer

check. This project will be sustainable and adopted by other units at the facility.

References

Alreja, G., Setia, N., Nichols, J., & Pantanowitz, L. (2011). Reducing patient identification errors related to glucose point-of-care testing. *Journal of pathology informatics*, 2, 22-23. https://doi.org/10.4103/2153-3539.80718

Borgert, M., Binnekade, J., Paulus, F., Goossens, A., Vroom, M., & Dongelmans, D. (2016). Timely individual audit and feedback significantly improves transfusion bundle compliance-a comparative study. *International Journal for Quality in Healthcare*. *28*(5), 601–607. https://doi.org/10.1093/intqhc/mzw071

Dahl, O. J. (2021). An Honest Assessment of Your Healthcare Practice: The SWOT Analysis. *Journal of Medical Practice Management*, *36*(5), 256–259.

Diefenbacher, S., Fliss, P. M., Tatzel, J., Wenk, J., & Keller, J. (2019). A quasi-randomized controlled before–after study using performance feedback and goal setting as elements of hand hygiene promotion. *Journal of Hospital Infection*, *101*(4), 399–407. https://doi.org/10.1016/j.jhin.2019.02.001

Estock, J. L., Pham, I.-T., Curinga, H. K., Sprague, B. J., Boudreaux-Kelly, M. Y., Acevedo, J., & Jacobs, K. (2018). Reducing Treatment Errors Through Point-of-Care Glucometer Configuration. *Joint Commission Journal on Quality & Patient Safety*, *44*(11), 683–694. https://doi.org/10.1016/j.jcjq.2018.03.014

Friesen, W. (2016). Change Management: A Key To A Successful Future. *Business Credit*, *118*(9), 42–43.

Hagel, S., Reischke, J., Kesselmeier, M., Winning, J., Gastmeier, P., Brunkhorst, F., & Pletz, M. (2015). Quantifying the Hawthorne Effect in Hand Hygiene Compliance Through

Comparing Direct Observation With Automated Hand Hygiene Monitoring. *Infection Control & Hospital Epidemiology*, *36*(8), 957-962. doi:10.1017/ice.2015.93

Hutchinson, A. M., Brotto, V., Chapman, A., Sales, A. E., Mohebbi, M., & Bucknall, T. K. (2020). Use of an audit with feedback implementation strategy to promote medication error reporting by nurses. *Journal of Clinical Nursing*, *29*(21–22), 4180–4193. https://doi.org/10.1111/jocn.15447

Jolliffe, L., Morarty, J., Hoffmann, T., Crotty, M., Hunter, P., Cameron, I. D., Xia Li, & Lannin, N. A. (2019). Using audit and feedback to increase clinician adherence to clinical practice guidelines in brain injury rehabilitation: A before and after study. *PLoS ONE*, *14*(3), 1–19. https://doi.org/10.1371/journal.pone.0213525

König, C., Plank, J., Augustin, T., Habacher, W., Beck, P., Frühwald, T., Pils, K., Sommeregger, U., Dovjak, P., Pinter, G., & Mrak, P. (2013). Effects of audit and feedback on Professional Practice in Geriatric Acute Care Units. *European Geriatric Medicine*, *4*(6), 394–400.

Liikanen, E., & Lehto, L. (2013). Training of Nurses in Point-of-care Testing: A Systematic Review of the Literature. *Journal of Clinical Nursing*. *22*(16), 2244–2252. https://doi.org/10.1111/jocn.12235

Lingervelder, D., Koffijberg, H., Kusters, R., & IJzerman, M. J. (2019). Point-of-care testing in primary care: A systematic review on implementation aspects addressed in test evaluations. *International Journal of Clinical Practice, 73*(10). https://doi.org/10.1111/ijcp.13392

Price, C. P., Smith, I., & Van den Bruel, A. (2018). Improving the quality of point-of-care testing. *Family Practice*, *35*(4), 358–364. https://doi.org/10.1093/fampra/cmx120

Portney, L. G. (2020). *Foundations of Clinical Research: Applications to Evidence-based Practice*. Fourth edition. F.A. Davis.

Reynolds, S. (2020). Using audit and feedback to improve compliance with evidence-based practices: Take a strategic approach to prevent lost opportunities for improvement. *American Nurse Today, 15*(10), 16–19.

Shaw, J., (2016). Practical challenges related to point of care testing. *Practical Laboratory Medicine,* 4. pp. 22-29

Shaw, J. (2017). The Dark Side of Point-of-care Testing. *Clinical Biochemistry, 50*(9), 466. https://doi.org/10.1016/j.clinbiochem.2017.03.003

Schaffer, M. A., Sandau, K. E., & Diedrick, L. (2013). Evidence-based practice models for organizational change: Overview and Practical applications. *Journal of Advanced Nursing, 69*(5).

Stefan, S. C., Popa, S. C., & Albu, C. F. (2020). Implications of Maslow's Hierarchy of Needs Theory on Healthcare Employees' Performance. *Transylvanian Review of Administrative Sciences*, 59, 124. https://doi.org/10.24193/tras.59E.7

Solomon Kurz, A. (2019). Want to see more behavior? Consider institutional-level positive reinforcement. *Journal of Contextual Behavioral Science*, 14, 29–31. https://doi.org/10.1016/j.jcbs.2019.08.006

The Joint Commission. National Patient Safety Goals. Retrieved from https://www.jointcommission.org/standards/national-patient-safety-goals

Tuyet Thi Tran, & Gandolfi, F. (2020). Implementing Lewin's Change Theory for Institutional Improvements: A Vietnamese Case Study. *Journal of Management Research. 20*(4), 199–210

US Department of Veterans Affairs. (2021). VA Long Beach Healthcare System. Retrieved from

    https://www.longbeach.va.gov

Whalen, M., Maliszewski, B., Gardner, H., & Smyth, S. (2021). Audit and Feedback: An

    Evidence-Based Practice Literature Review of Nursing Report Cards. *Worldviews on*

    Evidence-Based Nursing, *18*(3), 170–179. https://doi.org/10.1111/wvn.12492

Winslow, S., Cook, C., Eisner, W., Hahn, D., Maduro, R., & Morgan, K. (2019). Care delivery

    models: Challenge to change. *Journal of Nursing Management*. *27*(7), 1438–1444.

    https://doi.org/10.1111/jonm.12827

TABLE 1

Budget

EXPENSES		REVENUE	
Direct		Billing	
Salary and benefits	$455	Grants	$350
Supplies	$243	Institutional budget support	$350
Services	$120		
Statistician	$120		
Indirect			
Overhead	$105		
Total Expenses	1,043	Total Revenue	$700
Net Balance			$343

Table 2

Action Plan and Timeline

Task	Day/Week	Responsible Party
Present the project	Day 1	Myself: the project manager
Obtain Approval for the project	Day 2	Project Manager
Obtain approval to access the EMR	Day 4	Project Manager
Educate the nurses and ither stakeholders on the step by step	Week 5	Stakeholder, my preceptor and ED manager
Compiling the pre-intervention data	Week 6	Nurses
Starting performing audits of nurses while conducting point of care test, during different shifts in the ER	Week 6	Project manager
Compilation of data collected during the auditing phase	Week 7 to 10	Project manager
Conducting a post-intervention audit	Week 11-12	Project manager

Table 3

Two-Tailed One Sample t-Test for the Difference between compliance.

Variable	M	SD	μ	t	p	d
compliance	71.50	16.26	0.5	6.17	.102	4.37

Findings: Alpha value of .05, t (1) = 6.17, p = .102.

Note. Degrees of Freedom for the t-statistic = 1. d represents Cohen's d.

Appendix A

Summary of Primary Research Evidence

Citation	Design, Level Quality Grade	Sample Sample size	Intervention Comparison	Theoretical Foundation	Outcome Definition	Usefulness Results Key Findings
Liikanen, E., & Lehto, L. (2013). Training of nurses in point-of-care testing: a systematic review of the literature. *Journal of Clinical Nursing. 22(*15–16), 2244–2252. https://doi.org/10.1111/jocn.12235	Level 1 Systematic review	Six initiatives were analyzed from 5 healthcare settings	A literature search of electronic database. Articles that included interventions to improve the	The framework for the study was PEO (population, Exposure and outcomes	An improvement in the nurses competence level with devices after interventions	Training can improve a nurses' competence in a skill. More research needs to be done to in how improve a

			competence level for the use of POCT devices		like the use of posters	nurse' skill in POC. Nurses can be trained using a variety of methods.
Hutchinson, A. M., Brotto, V., Chapman, A., Sales, A. E., Mohebbi, M., & Bucknall, T. K. (2020). Use of an audit with feedback implementation strategy to promote medication error reporting by nurses. *Journal of Clinical Nursing, 29*(21–22), 4180. https://doi.org/10.1111/jocn.15447	Quasi-experimental implementation study Level 3	Enrolled nurses were 162	The nurses reporting medication errors voluntarily	Two frameworks: 1.The Promoting Action on Research Implementation in Health Services (PARIHS) framework 2. The theory of planned behavior	The rate of medication errors reported per month	The audit with feedback strategy did not heavily influence the voluntary reporting of the nurses to voluntary medication errors by nurses. This research adds to the evidence of the impact audit and feedback have on nurses

Ivers N, Jamtvedt G, Flottorp S, Young JM, Kristoersen DT, O'Brien MA, (2012). Audit and feedback: Effects on professional practice and healthcare outcomes. Cochrane Database Systematic Reviews. 2012;6(6)	Systematic review Level 1	30 studies on the subject were Included	Intervention is the use of audit and feedback. on the practice of healthcare professionals and patient outcomes	No clear definition of an framework	Impact of audit and feedback on the way healthcare professionals practice	Audit and feedback are very effective when performance is low and the provider of the feedback is a supervisor or a senior colleague and when it done often. However, there are cost associated with frequent audits.
Effectiveness of barcoding for reducing patient specimen and laboratory testing identification	Systematic review Level 1	17 observational studies	Are barcoding practices effective at	The use of the ASK theoretical	The use of barcoding as being effective	Barcoding is important is reducing errors

errors: a Laboratory Medicine Best Practices systematic review and meta-analysis. *Clinical biochemistry*, *45*(13-14), 988-998.		10 for patient specimen and 7 for point of care testing	reducing patient specimen and laboratory testing identification errors?	framework and the A 6 cycle systematic review method	in reducing the rate of errors associated with specimen and laboratory testing	of patient specimen and laboratory testing identification
Whalen, M., , B., Gardner, H., & Smyth, S. (2021). Audit and Feedback: An Evidence-Based Practice Literature Review of Nursing Report Cards. *Worldviews on Evidence-Based Nursing*, *18*(3), 170–179. https://doi.org/10.1111/wvn.12492	Level 2	8 articles	Does implementing an individualized audit and feedback report tool for nurses Improve compliance, adherence, and/or performance of nursing tasks	Johns Hopkins Nursing EBP Model	Evaluating if the use of audit and feedback can improve a nurse adherence to performing nursing tasks	The timing of the use of adherence and feedback is important in achieving the outcome

	Level 4	2 ICU	Audit and	There is	Outcome is	The use of
Borgert, M., Binnekade, J., Paulus, F., Goossens, A., Vroom, M., & Dongelmans, D. (2016). Timely individual audit and feedback significantly improves transfusion bundle compliance-a comparative study. *International Journal for Quality in Healthcare. 28*(5), 601–607. https://doi.org/10.1093/intqhc/mzw071	Experimental study	teams 125 nurses	feedback is the intervention The use of a monthly Audit and Feedback, on a team level versus using a combination of monthly A&F on team level plus timely individual feedback.	the use of the care bundle and the "All in one" approach	use bundle compliance as it related to blood transfusion	monthly Audit & Feedback at the team level with timely individual A&F had greater impact on compliance bundle, as opposed to the use of a monthly Audit & feedback,

						on team level alone

Appendix B

Summary of Systematic Reviews (SR)

Citation	Quality Grade	Question	Search Strategy	Inclusion/ Exclusion Criteria	Data Extraction and Analysis	Key Findings	Usefulness/Recommendation/ Implications
Liikanen, E., & Lehto, L. (2013). Training of nurses in point-of-care testing: a systematic review of the literature. Journal of Clinical Nursing. 22(15–16), 2244–2252. https://doi.org/10.11 11/jocn.12235	Level 1	1.Which POC tests are used when training nurses, where is the training delivered? 2 What kind of training is given to the nurses? 3 What are the results of training	Various database was searched ike CINAHL, The Cochrane Library, Medline	Inclusion criteria: Articles that deal with training of nurses in POCT. English and peer reviewed Exclusion criteria: 1.Articles that deal with Training other health professional.	Data extraction nvolve two researchers going through ooking at abstract and then full articles. Data was analyzed using statistical	Training can mprove a nurses' competence n a skill.	More research needs to be done to in how mprove a nurse' skill in POC

			(Ovid) and Scopus	2. Other activity in POCT. 3. Articles that are relevant	analysis, with PASW statistical software version 18		
Ivers N, Jamtvedt G, Flottorp S, Young JM, Kristoersen DT, O'Brien MA, (2012). Audit and feedback: Effects on professional practice and healthcare outcomes. Cochrane Database Systematic Reviews. 2012;6(6)	Level 1	1: Is audit and feedback effective for improving health provider performance and healthcare outcomes? 2. What key factors explain variation in the	Databases searched nclude Ovid, Crochrane, Medline, CINAHLEbsco, Science Citation ndex and Social	Inclusion criteria: complete manuscripts were used, to prevent uncertainty. Articles with the stated intervention were included.	Data extraction was done by two ndependent authors Studies were excluded	Audit and feedback are great tools to mprove practitioner compliance to a practice.	

		effectiveness of audit and feedback? 3.How does the effectiveness of audit and feedback compare to other interventions?	Sciences Citation.				
Hutchinson, A. M., Brotto, V., Chapman, A., Sales, A. E., Mohebbi, M., & Bucknall, T. K. (2020). Use of an audit with feedback	Level 3	Does audit with feedback promote voluntary medication error reporting by nurses?"	Cochrane reviews	Inclusion criteria: studies with audit and feedback on doctors studies with on the role of audit and feedback	Data from the control and non-control ward were collected retrospectively. Descriptive statistics,	Feedback by tself is not enough to make nurses report medication errors.	The use of a quasi-experimental design helped to minimize the external validity

implementation strategy to promote medication error reporting by nurses. Journal of Clinical Nursing, 29(21–22), 4180. https://doi.org/10.11 11/jocn.15447				on nurses ability to report/	especially the use of frequencies, were employed		The use of audit and feedback did not increase the rate of reporting of medication errors among nurses.
Effectiveness of barcoding for reducing patient specimen and laboratory testing identification errors: a Laboratory	Level 1	Are barcoding practices effective at reducing patient specimen and laboratory testing	PubMed, Embase and CINAHL	Articles included involved patient barcoding and laboratory testing.	23 eligible studies to begin, 6 were excluded due to poor study quality rating. A total of 17 studies were ncluded	Barcoding is effective in reducing patient specimen and aboratory	The use of barcoding before recommended as an evidence-

Medicine Best Practices systematic review and meta-analysis. Clinical biochemistry, 45(13-14), 988-998.		identification errors?				testing dentification errors in different hospital settings.	based "best practice.
Whalen, M., Maliszewski, B., Gardner, H., & Smyth, S. (2021). Audit and Feedback: An Evidence-Based Practice Literature Review of Nursing Report Cards. Worldviews on Evidence-Based	Level 2	Does implementing an individualized audit and feedback report tool for nurses Improve compliance, adherence, and/or	Coc hrane Library, the JBI Database, PubMed, and CINAHL	58 Articles were excluded because they did not answer the EBP question, leaving 9 articles	Articles were synthesized using the EBP model	There is a need for more research to be done in showing the effect of audit and feedback in nursing	There is a need for more research to be done.

Nursing, 18(3), 170–179. https://doi.org/10.1111/wvn.12492		performance of nursing tasks					
Borgert, M., Binnekade, J., Paulus, F., Goossens, A., Vroom, M., & Dongelmans, D. (2016). Timely individual audit and feedback significantly improves transfusion bundle compliance-a comparative study.	Level 4	To investigate the difference in effect on transfusion bundle compliance between two Audit and Feedback (A&F) strategies to implement the transfusion bundle	nclusion criteria nclude the CU unit	ICU nurses on two units were included	Data were collected prospectively from the electronic registration system (Patients Data Management System, PDMS). Student's t-test was used to	Feedback at the team evel with timely ndividual A&F had greater mpact on compliance bundle. On the other hand, the use of a	One of the imitation of this study was that it was not always easy to meet the nurse 72 hrs after, to give a feedback. Further research needs to be done on the

					measure the two	monthly	mpact of a
International Journal for Quality in Healthcare. 28(5), 601–607. https://doi.org/10.10 93/intqhc/mzw071					groups. Analysis was performed using the R version of foundation for statistical computing.	Audit & feedback, on team level alone had ess impact.	onger period of intervention. Also, the mpact that technology will have on owering the cost of ntervention.

Appendix C

PRISMA Literature Search Strategy Diagram
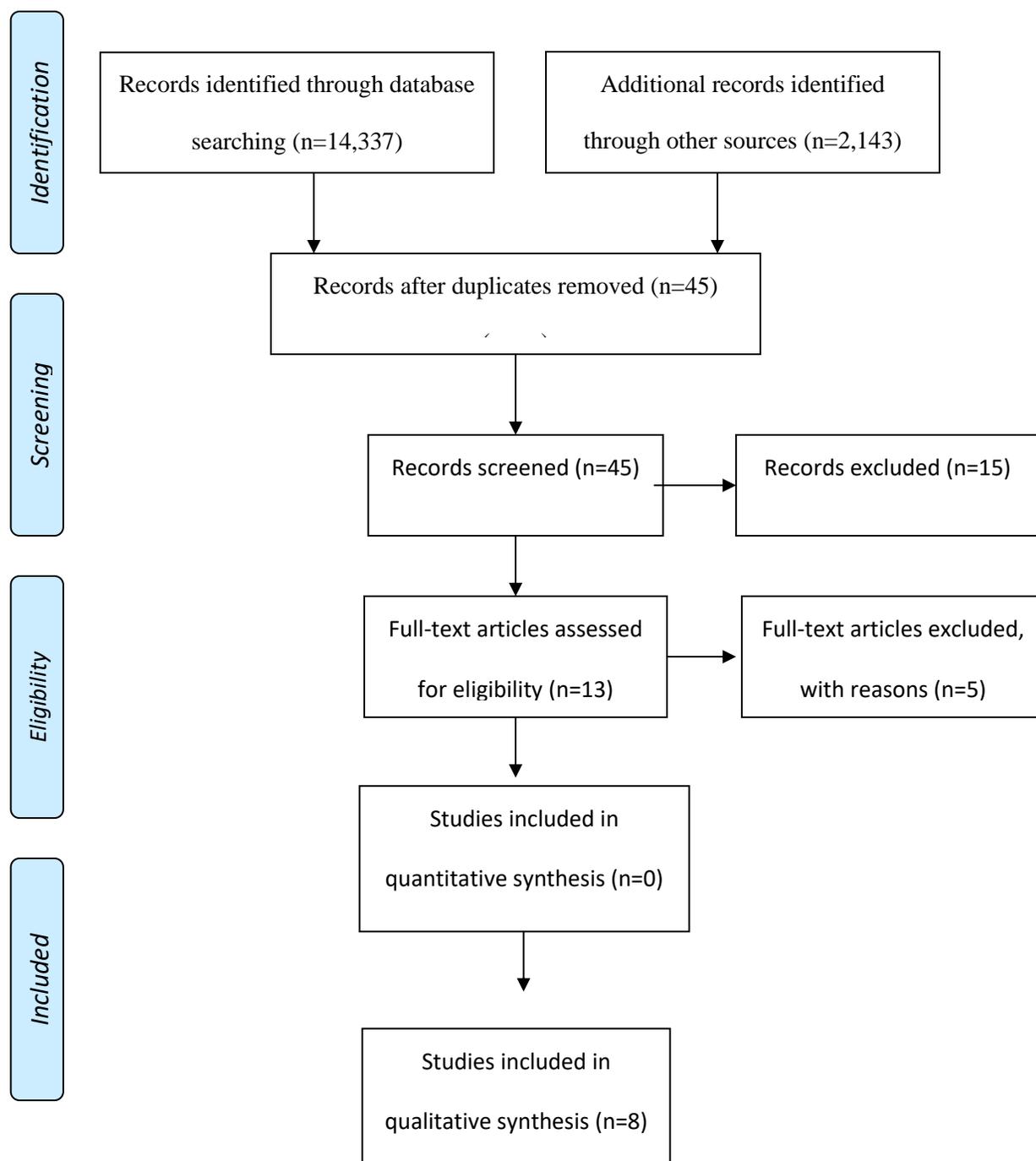
Appendix D

Post-Intervention Data Collection Tool

Name of Nurse					
Date					
Shift	0730-2000	0930-2200	1130-MN	1400-0030	1930-0800
Nurse scanned patient before glucometer check	Yes	No			

Signature of nurse: _____

Signature of auditor: _____

Appendix E

Project Schedule

Activity	NUR7801								NUR7802								NUR7803							
	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
Meet with preceptor	X	X	X	X	X	X	X	X	X	X	X	X	X		X		X		X			X		X
Prepare project proposal		X	X	X	X	X	X	X																
Activities: Obtain approval for the project		X																						
Educate the nurses and the stakeholders on step by step process of the project				X			x / x																	
Collecting preintervention data using current information										x	x													
Performing audits of nurses during point of																	x	x						

Activity	NUR7801								NUR7802								NUR7803							
	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
care tests																								
Audits and feedback at different shifts in the ER					X	x	x	x	x	x	x													
Compilation of data collected during the auditing phase						x										x								
Post intervention data collection/Dissemination																		x						

Activity	NUR7801								NUR7802								NUR7803							
	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15
Sustainability measures								x																
Meet with stakeholders						x					x							x	x					
Designating Unit champions							x																	
Data Analysis																	x	X						
Project Evaluation																				x	x			
Project presentation																						x		

Activity	NUR7801								NUR7802								NUR7803							
	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15	Week 1	Week 3	Week 5	Week 7	Week 9	Week 11	Week 13	Week 15