**Use of BCMA**

The use of BCMA is becoming increasingly prevalent due to the perceived benefits that it offers to both the patients as well as the medical pesonel. For the staff, it helps to reduce adverse drug events resulting from medication errors. Alternatively, it allows personell to promote beter patient outcome by eliminating possible staff error during ddrug administration. Therefore, this work will examine the role of BCMA in the elimination of medication errors within the Veteran’s Affairs facility. The work relies on severl data collection instruments such as surveys and evaluation metrics in the first section to determine the readiness of the facility for BCMA. Section B covers the current problems pertinent to BCMA within the facility. The literature provided in section C supports the objective of this project which is to reduce the number of medication errors within 6 months of use at the facility. Section D deals with the solution description which is the application of bCMA in the establishment. The change model in section E pertains to Duck’s change model which was chosen to assess the change process anticipated in the facility. Section F and G pertain to the implementation and the evaluation of the project which was achieved by constructing a ratio juxtaposing the rate of medication errors before and after implementation of the project.

**Organizational Culture and Readiness Assessment**

**Organization Survey Results**

The survey instrument chosen for the readiness assessment of the establishment for its readiness for the use of evidence based practice “Organizational Culture and Readiness for System Wide Integration.” (Melnyk & Fineout-Overholt, 2014). The primary reason for the assessment of the facility is to ascertain its readiness to facilitate EBP as a standard for practice.  Moreover, assessment is vital for a clearer comprehension on what needs to be improved within the facility for EBP to become readily implementable.

**Low Scores**

Some metrics scored lower such as: the congruence of the mission statement and EBP. The establishment’s mission is to provide for those who have borne the battle and their widows and orphans.

**High Scores**

The higher scores related to the observable dependence on EBP in the facility treatment plans as seen through its commitment to the use therapy to meet the psychological wants of the Veterans (Karlin & Cross, 2014). It can hence be concluded that the organization is moderately equipped for the implementation of EBP.

**Facilitators**

The willingness of the administrators as well as the staff in the adoption of EBP is a significant determinant in the adoption of EBP at the VA. The rationale behind this is that the staff and leadership at the facility are well educated on the efficacy of EBP.

**Integrating Clinical Inquiry**

To this effect clinical inquiry would be best placed when used in the research stage of EBP (Brownson, Colditz, & Proctor 2017). In doing so, fundamental questions concerning clinical practice may be asked and answered comprehensively while at the same time expanding the data that the organization possesses (Helfrich, Li, Sharp, & Sales 2009).

**Problem Description**

**Background**

While the facility has tremendously added to the capacity of Veteran-oriented healthcare it has failed to curb the cases involving medication errors. Conjunctively, these medication errors create a burden for the facility that adversely affects the VA hospital finances as well as its staff and patients. It is understood that medication errors are not only those that pertain to the wrongful prescription of medicines, but also those that involve other processes within the drug administration process such as the use of the proper route of administration, involving the right patient, administering drugs at the right time and so on. (Institute of Medicine, 2006). The primary reason that this matter needs to be resolved is because of the health risks that errors can cause Veterans.

The whole premise of BCMA systems is that nurses do not occupy positions that would promote the erroneous administration of medications without scanning a patient armband and verifying the five ‘rights’ for medication delivery. A 2014 report suggests that adverse drug events alone have accounted for slightly over 500 deaths in the previous four years across the entirety of VA facilities in the USA. According to Harrington et al. (2013), the use of bar code medication administration could greatly promote positive patient outcomes while simultaneously reducing the facility’s exposure to liability.

**Stakeholders and Change Agents.**

Veterans receiving treatment from the facility are the primary stakeholders in this project. The reasoning behind this is that the Veterans stand to lose the most in cases of medication errors as it may lead to adverse reactions which may cause further health complications, and sometimes death (IoM, 2006). The application of BCMA would ensure that Veterans’ records are accurate which would subsequently reduce the chances of medication errors.

The other stakeholders/agents of change in the matter are the nurses, and other medical personnel in the institution. By relying on BCMA, nurses can hope to experience a significant reduction in medication errors and subsequently adverse drug events (Samaranayake et al., 2014)

The final stakeholder is the executive leadership of the VA facility due to its responsibility to provide patients with excellent healthcare. According to Voshall, Piscotty, Lawrence & Targosz (2013) the use of BCMA systems should hence reduce the risk of liability for the leadership due to the safety parameters set by the system.

The other important stakeholders are the nurse managers who oversee a variety of functions including patient medication. Per Samaranayake et al. (2014), by using BCMA systems it is anticipated that the nurse managers should achieve better accuracy with regard to the administration of medication on the unit.

**PICOT Question.**

The major issue pertains to whether the initiation of a bar code medication dispensing process will reduce the medication error rates. Hence, this project will be driven by the PICOT format (Melnyk & Fineout-Overholt, 2014).

P= Veterans.

I= implementation of bar code medication administration.

C= current medication error rate.

O=a reduction in the rate of medication errors.

T= six months after the commencement of the project.

**Purpose**

The primary purpose of this project is to first promote patient’s safety. In doing so the project is anticipated to achieve lower patient mortality resulting from adverse drug events (IoM, 2006).

**Objectives**

The objective of the project is to reduce medication errors by removing nurses from positions where they are more likely to make such errors, as well as empowering them with the right tools and knowledge to improve patient safety and outcomes through the bar code system which would facilitate safer drug administration (IoM, 2006).

**Rationale**

The issue of medication errors within the organization has become a pressing matter due to the potential loss of life involved. The importance of using the BCMA system lies in the fact that it facilitates assuring the medication five rights are followed for every medication dispensing event.

**Literature Support**

**Search**

The scholarly articles databases were accessed to find the necessary information required in supporting the literature for this research. The database that was used includes Jstor, ProQuest and EBSCOhost. Data collection of the evidence showed that medication errors create a burden for the facility that adversely affects patients, finances, and staff.Search terms and keywords included veteran administration, heuristic evaluation, nursing informatics, barcode medication, administration system, usability, acute care, BCMA system, and location of care, were used.  Inclusion criteria was less than 10 years old and the main theme of BCMA. The search resulted in five studies for review for this project.

**Review Summary**

According to Harrington et al. (2013), bar code medication administration usage could greatly decrease the facility’s exposure to liability whereas concurrently encouraging positive patient outcomes. Per the primary research study undertaken by Morriss et al. (2009), the implementation of BCMA offers an opportunity for the nurses, and other medical personnel to improve health outcomes such as reducing adverse events associated with medications administered to a patient. In Voshall et al. (2013), states that executive leadership also has an important role in minimizing medication errors through reducing the liability risk because of its responsibility in providing patients with ample healthcare. According to Samaranayake et al. (2015), Nurse Managers who oversee several functions including patient medication, normally accomplish better accuracy through use of BCMA in relation to medication administration.

Using an evidence-based worksheet, the research carried out a gap examination on bar-code medication administration in the acute care locale. Quality enhancement initiatives were implemented based on the results from the original gap analysis, and subsequently a reassessment of identifying potential development of the acknowledged gaps.

The quality enhancement initiatives clearly demonstrated that prevention of medication errors in veteran health facilities through the evidence-based approaches concentrated on the use of BCMA. BCMA systems may minimize medication errors, though technical problems are very common.

**Strength and Weakness of the Studies**

This study with regards to the proposed research provides an extensive information on how BCMA could assist in the decline of medication errors and consequently, Adverse Drug Events (Siew, 2017). One weakness of studies is they failed to account for some factors such as resistance to change from the staff as well as the patients? Moreover, the studies are limited to a particular populace; the variables are not distributed in the entire populace, hence only helpful to that specific population. However, the studies exhibit strength in their analysis of BCMA in the context of hospitalized patients given that the study non-hospitalized patients would lead to widely varying conclusions concerning the efficacy of BCMA.

**Proposed Solution**

The intended solution for the outcome cited in this work is the implementation of the BCMA system with the facility.

**Organizational Culture**

The organizational culture of the institution is one of careful progression. This was primarily determined via the use of the “Organizational Culture and Readiness for System Wide Integration” instrument provided in Melnyk & Fineout-Overholt (2014). According to Helfrich et al. (2009) and the data collected during the survey of the staff as well as its administrative personnel indicates that the staff was extremely receptive to the use of EBP, specifically BCMA to improve patient outcomes.

**Expected Outcomes**

The outcome expected is to reduce medication errors in the facility. Moreover, the number of adverse drug events resulting from medication errors is expected to decline significantly within the six months of application of BCMA. A better sentence would be: Additionally, BCMA will significantly reduce the risk of nurses making medication errors (Giomuso et al., 2016).

**Methods to Achieve the Outcome**

The nurses and relevant staff will be well trained on the use of BCMA and the importance of a reduction of medical errors in the facility.

**Barriers to Implementation**

The most significant barrier to the implementation of BCMA within the facility is the resistance by the staff in the adoption of new medical technology. It is evident that the staff will want to use processes that they are used to. The most convenient way to overcome this barrier is to provide adequate support mechanisms such as education and resources that make it easier for the staff to adopt BCMA.

**Outcome Impact**

It is expected that by reducing medication errors will increase patient safety and promote a better outcome for the hospitalized patients at the facility (Hain & Kear, 2015).

**Change Model**

Duck’s change curve model is particularly useful in the assessment of evidence-based practice (EBP) regarding the application of bar-code medication administration (BCMA). The rationale behind this claim lies in the fact that this change model concerns the assumptions that are mandatory or suitable in order for the desired change to occur within the organization (Melnyk & Fineout-Overholt, 2014). Among the assumptions highlighted by this change model is that the change process is highly emotional which makes an emotional perspective fundamental if the change is to occur as intended. Moreover, Duck’s change curve model is also paramount for the implementation of BCMA, because the model seeks to highlight the stages of implementation that have a higher likelihood of failure. These stages include stagnation, preparation, implementation, determination, and fruition.

**Stagnation**

Stagnation is the initial stage in the chosen change model. It is at this stage that the individuals responsible for development should begin their assessment of the personnel within the facility. This serves to understand the cause of the facility’s stagnation regarding the application of BCMA. It is normal for nurses as well as other medical personnel at the facility to feel comfortable at this stage which has been cited as one of the most pressing reasons for stagnation (Melnyk & Fineout-Overholt, 2014). Per Giomuso et al. (2016), it has been argued that nurses at this stage may also not feel any sense of urgency or alternatively, they may be exhausted from hyperactivity resulting from depressing organizational actions such as failure or poor execution of initiatives. The development team will seek to end this stage of the model by taking action.

**Preparation**

It is important that the implementation team take the emotional state of the personnel within the facility into account. Since a negative emotional state may be a hindrance, it is vital that the team ascertains what the relevant staff at the facility are willing to do to facilitate successful implementation (Melnyk & Fineout-Overholt, 2014). This may be achieved through individual assessment of the nurses and other professionals at the facility.

**Implementation**

Implementation is the stage when the personnel will be assessed for their readiness in the implementation of BCMA. Milestones will also be set at this stage. This may be done through the planning of educational workshops which are meant to increase nurse’s capacity in the installation of BCMA. At this stage, it is important to identify how the staff will benefit from the intervention application (Melnyk & Fineout-Overholt, 2014). Since the major gains for the staff are the skills gathered from running and maintaining a BCMA system, the development team should communicate the importance of this skillset to the nurses via the forums cited previously.

**Determination**

Determination is the fourth stage of the chosen change model, and it is concerned with the assessment of the implementation so far. The major obstacle at this stage is a lack of visible change which may cause a drop in motivation (Melnyk & Fineout-Overholt, 2014). According to Bohenkamp et al. (2014), since it is at this stage that the implementation process faces the highest likelihood of failure, it imperative that the team meets at least one of the milestones or risk losing staff motivation to fatigue.

**Fruition**

Fruition is the fifth stage of the Duck’s change model and it entails the observation of positive outcomes. At this stage, it is expected that patients at the facility will have begun to experience better health outcomes to the implementation (Malik, McKenna, & Griffiths, 2017). Additionally, as the staff becomes more acquainted with the BCMA process there will be surge in confidence while executing professional tasks thereby reducing resistance to implementation (Harrington et al., 2013)

**Implementation Plan**

**Subjects**

The VA facility where this project will be implemented is in a semi-rural region in the mid-south. The facility provides care for approximately 55,000 veterans with multiple levels of complexity (Karlin & Cross, 2014). The application of bar-code medication administration (BCMA) in the facility is for hospitalized patients.  Since the effective application of BCMA requires a change in organizational culture (Kelly et al., 2016).

**Timeline**

The project planning is expected to take ~~up~~ approximately four months while the project itself is expected to take up to six months before visible results can be observed (see appendix timeline).  The first step in this phase will be to collect relevant information concerning the staff’s current knowledge on BCMA. This data will be useful to provide insight concerning the staff’s beliefs about BCMA.

The second step in the implementation process will be to identifying experts who will provide training on BCMA. This stage will take approximately one month.

The third and final step will be the support stage where the experts will present their professional findings concerning BCMA with the staff over a period of one month. Per Lawton et al. (2012), this step will take the form of forums that can be held jointly within the facility for better efficiency.

**Solution Process and Resources**

The process for this project involves establishing a team of experts that will be in charge of educating both the management, and the staff concerning the use of BCMA. According to Kelly et al. (2016), at this stage, the team will primarily be concerned with the collection and dissemination of relevant information as a means to gauging the staff’s stand on BCMA. More importantly, wages or service fees for these experts, and support staff should be considered (see budget in appendix)

The major cost will arise primarily from the wages payable to the team. And from the provision of data collection tools. The team will be limited to eight individuals for efficiency.

**Solution Methods and Instruments for Data Collection**

The survey will be administered approximately three times i.e. before, during, and after training. Another instrument that will be used to measure the efficacy of the project is the number of medication errors before and after training.

**Intervention Process**

The initial stage of the intervention will pertain to the provision of relevant training to both the expert team as well as the staff. Moreover, the proposed solution will be delivered via a multi-faceted approach comprising of training via forums.

**Data Collection Plan**

All data pertaining to the medication error rate will be collected by the expert team. The data will be collected by assessing the number of medication errors before and after the introduction of BCMA in the facility.

**Feasibility of the Implementation Plan**

The plan is feasible because the technology has already been purchased and for every dollar invested in the implementation plan, the facility is expected to save significantly more than it would spend mitigating the issues that emanate from the older medication system. Implementation cost is significantly lower than the costs from medication errors and resulting adverse drug events (Early et al., 2011).

**Facilitators, Barriers, and Challenges**

The facilitators in this scenario are the facility’s management because they are ultimately responsible for signing over the funds that are required for the implementation of this project. According to Seibert et al. (2014), the major barriers to implementation are mainly staff resistance to the technology.

**Maintenance**

Per Harrington et al. (2013), it is important to ensure that BCMA procedures are being followed, and a staff that fails to do so will be reprimanded while those who exhibit ~~better~~ BCMA use should be rewarded. Reprimands will take the form of suspensions, sacking or removal of work privileges in depending on the severity of the error.

**Outcome Metrics Evaluate the Project Objectives**

According to Nanji et al. (2009), decreasing medication errors would ascertain the efficacy of the intervention. This is in line with the project objectives which aim to reduce medication errors. The data collected indicates that the use of BCMA within the facility significantly reduces the number of medication errors (Kelly et al., 2016). This metric was achieved by dividing the number of drug administrations by the number of medication errors. The resulting ratio was almost negligible suggesting that the process is highly effective.

**Validity, Reliability, and Applicability**

The validity, applicability and reliability of the process is strong due to the easy evaluation of the relevant metrics (Poon et al., 2010). For instance, the number of medication errors before and after the intervention can be measured by dividing the number of drug administrations by resulting medication errors to come up with a sufficient ratio.

**Adjustment Strategies**

The purpose of the project is to train teach the nurses how to use BCMA and subsequently reduce the number of medication errors within the facility. The program is computerized system which means that there are limited adjustment strategies. (Al Mustafa, Khan, & Hussain 2018) Staff that fails to use the BCMA parameters will be reprimanded by reporting them to the relevant authorities in the facility.

**Implications for Practice and Future Research**

Per Kelly et al. (2016), the success of the project should show that with a well-trained and educated staff, BCMA may be used to achieve reduced medication errors within a relatively short period.

**Conclusion**

Given the evident advantages that BCMA provides to veterans within the facility it is certain that its efficacy significantly promotes patient outcome. By training the staff on the use of BCMA it is anticipated that the number of medication errors and resulting ADE’s will drop significantly. Therefore, the model proposed in this work stands to benefit other establishments should it be applied because all patients, veteran or otherwise should benefit from the best healthcare practices available.

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