

MEDICATION RECONCILIATION EDUCATION IN AN OUTPATIENT MENTAL  
HEALTH CLINIC

by

Kengne Fosso

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As members of the DNP Project Committee, we certify that we have read the DNP project prepared by Kengne Fosso, titled Medication Reconciliation Education in an Outpatient Mental Health Clinic and recommend that it be accepted as fulfilling the DNP project requirement for the Degree of Doctor of Nursing Practice.

*Sara J. Edmund*  
\_\_\_\_\_  
Sara J. Edmund, DNP, RN, FNP-C, PMHNP-BC  
Date: Nov 8, 2021

*Lindsay Ann Bouchard*  
\_\_\_\_\_  
Lindsay Ann Bouchard, DNP, RN, PMHNP-BC  
Date: Nov 8, 2021

*Shawn Patrick Gallagher*  
\_\_\_\_\_  
Shawn P. Gallagher, PhD, PMHNP-BC, PMHCNS-BC, FNP-BC  
Date: Nov 8, 2021

Final approval and acceptance of this DNP project are contingent upon the candidate's submission of the final copies of the DNP project to the Graduate College.

I hereby certify that I have read this DNP project prepared under my direction and recommend that it be accepted as fulfilling the DNP project requirement.

*Sara J. Edmund*  
\_\_\_\_\_  
Sara J. Edmund, DNP, RN, FNP-C, PMHNP-BC  
DNP Project Committee Chair  
College of Nursing  
Date: Nov 8, 2021



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## ABSTRACT

**Purpose:** This quality improvement project aimed to enhance providers' and staff's knowledge about the importance of medication reconciliation (MR) at an outpatient mental health clinic called Bella Vista Integrated Health. It also aimed to increase their confidence in performing MR.

**Background:** Medication errors are the third leading cause of death in the United States. Medication errors are considered preventable and are often the result of improper MR. Studies support that MR is an effective way of recognizing medication discrepancies and preventing medication errors. The Joint Commission recognized the need to perform MR and identified it as their patient safety goal #8. The MATCH (Medication at Transition and Clinical Handoffs) toolkit (Appendix D) is an evidence-based toolkit developed with the support of the Agency for Healthcare Research and Quality (AHRQ) to enhance the workflow process of MR in an organization.

**Methods:** This DNP project consisted of an educational program which included a PowerPoint presentation to teach providers and staff about the importance of an accurate MR. The educational material included a pretest and a posttest to evaluate the participants' knowledge about MR. The pretest questionnaire tested the participants' baseline knowledge, and the posttest reevaluated their knowledge after they viewed the educational presentation and assessed their confidence level. A total sample N=12 responded to the invitation and eight participants completed the pretest and posttest.

**Results:** This project was successful in improving provider's and staff's knowledge about the importance of MR. There was an improvement in both knowledge and confidence in MR. The

pretest average score was 8/10. The posttest average was 9.63/10. Five participant's posttest scores improved after they viewed the PowerPoint presentation whereas two participants' scores remained the same in the pre and posttest. On a scale of 0 – 5, with '5' being as confident as possible, five participants reported '5' for their confidence level with MR.

**Conclusion:** This project was successful in improving providers' and staff's knowledge about the importance of MR. This type of educational program can be an effective tool for teaching staff about the importance of MR, and increasing their confidence in performing MR.

## INTRODUCTION

Between 1983-1993, approximately 8,000 people died from medication errors in the United States (US) (Kohn et al., 2000), whereas 7,000 to 9,000 people currently die each year from medication errors (Tariq et al., 2020). The increased prevalence of medication errors in the US has become a significant problem in the outpatient setting, where 87% of patients experience medication errors (Assiri et al., 2018). The high volume of psychiatric medication prescriptions and increased outpatient clinical encounters are risk factors for medication errors in the outpatient psychiatric setting (Medscape, 2007). Medication errors have also had a financial impact on the health care system. In outpatient settings, the associated cost per medication error in 2000 was approximately \$1,900, with a total cost of \$887 million nationally (Wolcott et al., 2006). The Joint Commission (TJC) supports the importance of medication reconciliation in reducing medication errors (The Joint Commission [TJC], 2020).

Varied attempts have been made to reduce medication errors. Some strategies have been shown to be successful. However, medication errors continue to be a concern in many healthcare settings. The Institute of Medicine (IOM) encourages organizations to implement strategies to reduce medication errors (Wolcott et al., 2006). Medication reconciliation (MR) is a cost-effective strategy for significantly reducing medication errors (McCarthy et al., 2016). This quality improvement (QI) project aimed to expand providers' and healthcare staff's knowledge about the importance of medication reconciliation, present a tool for reconciliation guided by the Medication at Transition and Clinical Handoffs (MATCH) toolkit (Appendix D), assess confidence levels, and address barriers to utilization of the tool in the Bella Vista outpatient psychiatric clinic. Bella Vista is one of the eight outpatient clinics of Bayless Integrated

Healthcare located in Arizona. The MATCH toolkit will guide the educational program. In addition to potentially increasing provider's and staff's knowledge, this project will also provide a resource on how this outpatient clinic can effectively implement the process of medication reconciliation.

### **Background Knowledge and Significance**

In the US, approximately one-third of adults take more than five medications per day (Agency for Healthcare Research and Quality [AHRQ], 2019). As psychiatric patients navigate through the healthcare system, patients must know their medical and psychiatric history and their current list of medications. Unfortunately, patients are not always reliable managers of their own medication regimes, and errors related to incomplete or inaccurate medication lists can lead to serious illness and, at times, death. Psychiatric illnesses are chronic conditions that often require a multidrug regimen; however, the frequent inability of the patient to name all the medications they are taking can lead to medication errors during prescribing (Persell et al., 2007). Errors made by prescribing providers due to misinformation from patients or other providers can lead to adverse drug events (ADEs), resulting in patient harm or death, and nearly half of these incidents of ADEs are preventable (AHRQ, 2019). Due to the complexity of the US healthcare system and the increasing number of available drugs, the risk of medication-related errors has increased in recent decades (Kohn et al., 2000).

### **Medication Errors**

Medication errors are the third leading cause of death in the US and are viewed as preventable (Food and Drug Administration [FDA], 2019). Medication errors are defined as “any preventable event that may cause or lead to inappropriate medication use or patient harm while

the medication is in the control of the healthcare professional, patient, or consumer” (NCCMERP, 2021). Medication errors may result from medication discrepancies, which include differences between the medications the patient actually takes and medications documented in the patient's medical record (Akram et al., 2015).

Approximately 60% of medication errors occur during admission, transition, or discharge, and these are usually a result of improper medication reconciliation (Kreckman et al., 2018). Incomplete medication history is often associated with the absence of information related to a medication strength, dose, or drug form. It is also common for a home medication list to lack information regarding over-the-counter or complementary medicines (Duguid, 2012). 27% of prescribing errors occur because of an incomplete medication history (Duguid, 2012). In outpatient settings, ADEs account for approximately 125,000 hospital admissions each year in the US (health.gov, 2020). Studies support the importance of the medication reconciliation process as an effective way to prevent medication discrepancies, medication errors, and adverse drug events (Almanasreh et al., 2016).

### **Medication Reconciliation**

In 2005, The Joint Commission (TJC) recognized the need to perform medication reconciliation to prevent medication errors and adverse drug events and identifies it as their patient safety goal #8 (NPSG.03.06.01) (TJC, 2020). MR is defined by TJC as the process of obtaining a current list of medications a patient is taking, documented in a form called “one source of truth” that is accessible to team members involved in medication management, and checking against new orders for medications discrepancies (TJC, 2020).

The definition of MR provided by the Institute for Healthcare Improvement (IHI) is the “process of creating the most accurate list possible of all medications a patient is taking — including drug name, dosage, frequency, and route — and comparing that list against the physician’s admission, transfer, and/or discharge orders, with the goal of providing correct medications to the patient at all transition points within the hospital” (IHI, 2021b). While the IHI and TJC provide consistent definitions, Mekonnen et al. (2016) also reports that the process should include a comparison of the medications currently in use to the medications listed on the current medication list while recognizing and documenting any discrepancies.

### **Medication Errors in Psychiatric Settings**

Given multiple-drug regimens and the complexity of mental health conditions, the potential for medication discrepancy is more significant among psychiatric patients (De las Cuevas & Sanz, 2004). Psychiatric patients are more likely to take more than one medication to treat their mental illness and other comorbid conditions (Simoons et al., 2016). They are more likely to receive medications from a variety of providers and pharmacies with little or no coordination between them; therefore, they are at greater risk for ADE’s leading to medication reactions, emergency room visits, hospitalizations, and even death (marine et al., 2017). The IHI, TJC, and the National Institute of Clinical Excellence (NICE) encourage medication reconciliation in healthcare organizations. However, the medication reconciliation process can be challenging as many US health care systems are fragmented in nature, which is especially true in psychiatric settings (Storm et al., 2019).

### **Barriers in Outpatient Mental Health Settings**

In the psychiatric setting, improper systemic self-regulation may contribute to errors in medication by failure to mandate a proper medication reconciliation process (Procyshyn et al., 2010). Many organizations find it challenging to effectively implement medication reconciliation due to a lack of a straightforward process, lack of agreement on the roles of staff members, duplication of information collected, and a lack of standardized tools (Barnsteiner, 2008). Given that many patients in psychiatric and ambulatory settings have chronic diseases as well, the need for an accurate medication list is all the greater (Barnsteiner, 2008).

### **Role of Advanced Practice Registered Nurses (APRNs) and Doctoral Prepared Nurse Practitioners (NPs)**

To meet the demands of the growing population and healthcare service for all citizens, the American Association of Colleges of Nursing (AACN) has recognized the important role Advanced Practice Registered Nurses (APRNs) and Doctor of Nursing Practice (DNP) prepared nurse practitioners (NPs) play in providing services to a wide range of patients with different health problems in the medical and mental health settings (Hathaway et al., 2006). APRNs and DNP-practitioners play an essential role in reducing healthcare costs, increasing patient access to healthcare settings, and promoting holistic care (Hathaway et al., 2006). DNP-prepared nurses and APRNs also play a role in reducing and resolving medication errors during patient transitions. One study supports the role APRNs play during medication reconciliation (Young et al., 2015).

Psychiatric mental health nurse practitioners (PMHNP) play an important role in medication reconciliation by effectively working in collaboration with other interdisciplinary

providers to ensure that psychiatric patients' medications are reconciled when patients are seen in the outpatient mental health setting. PMHNP also play a leadership role in the ever-changing healthcare field to promote effective change in the healthcare system. They help explore new approaches to improving patient care, improving outcomes, and increasing staff satisfaction.

### **Local Problem**

In the US, approximately 1 in 5 adults between the ages of 40-79 will use at least five medications simultaneously at some point in their life (Hales et al., 2019). Between 1996 and 2006, the likelihood of prescription of two or more psychotropic medications increased from 42.6% to 59.8% (Mojtabai & Olfson, 2010). Advanced age and taking multiple medications are associated with an increased risk of medication errors (Duguid, 2012). Patients with mood and anxiety disorders have the highest rate of combining two or more medications to treat their condition (Mojtabai & Olfson, 2010). In addition, comorbidities are also risk factors for medication errors (Assiri et al., 2018).

In 2015, 20.1 deaths per 100,000 people occurred in Arizona due to drug poisoning, placing Arizona 18th highest in the nation (Arizona Department of Health Services [AzDHS], n.d.). Psychiatric polypharmacy (using two or more medications to manage one psychiatric disorders) is common in treating many psychiatric disorders (Kukreja et al., 2013). Psychiatric polypharmacy can increase the risk of drug-to-drug interactions, leading to increased medication side effects or ADEs (Kukreja et al., 2013). For example, combining valproate and carbamazepine could instigate valproate to increase the carbamazepine level leading to neurotoxicity (Kukreja et al., 2013). In addition to their psychiatric issues, many patients may also have medical diseases, which puts them at a higher rate of polypharmacy (Mojtabai &

Olfson, 2010). People with comorbid diseases are at higher risk of medication errors than people with psychiatric polypharmacy (Assiri et al., 2018).

Bayless Integrated Healthcare provided care to at least 175,000 patients per year from childhood to adulthood with complex mental and medical issues in their eight clinics. Like other Bayless Integrated Healthcare clinics, Bella Vista clinic provides primary and behavioral health services for individuals from age 16 to frail elders. Many patients seen at Bella Vista clinic have complex psychiatric and medical issues. Given that this clinic provides care to patients with complex comorbid health issues, polypharmacy and the significant risk of medication errors are serious concerns.

### **Bella Vista Clinic**

Bella Vista clinic is an integrated outpatient practice in North Phoenix. Most patients seen in this clinic suffer from psychiatric or medical illnesses or both. Most are low-income and Medicaid recipients. Poverty is closely correlated to reduced educational achievement (Van der Berg, 2008). Therefore, health literacy may be a factor increasing their risk for medication mismanagement. Limited health literacy can impact patients and providers when attempting to reconcile medications as patients sometimes do not know their medication names, and taking multiple medications presents an additional challenge (Persell et al., 2007).

Patients seen in outpatient settings can often have complex conditions and comorbid diseases, which require them to see multiple providers (Keogh et al., 2016). The complexity of the healthcare system in the US makes it less likely that providers in the outpatient setting will take the time required to reconcile patients' medications during the visit, which could lead to medication discrepancies or adverse drug events (Keogh et al., 2016). At Bella Vista, Medical

Assistants (MAs) collect the list of medications the patient is taking before the appointment. MAs do not have any medical background or training in pharmacology. In addition, this process is not well-defined by providers or other medical staff. There seems to be redundancy in obtaining patient medication lists during admission because providers sometimes also get the list of medications themselves. Based on providers' reports at this clinic, documentation of a patient's medication list occurs in different places in the patient's medical record, increasing the likelihood of medication errors. Some providers at Bella Vista also report that medication duplication is more likely to occur in patients taking more than five medications due to patients' limited health literacy and confusion between medications' names.

There are multiple individuals involve in the medication reconciliation process, which leads to duplication of data. Both the MAs and providers gather the medication histories and document the information in different parts of the medical record. Very often, the different medication histories are not compared, and discrepancies are not resolved. After conversations with providers and staff, it was identified that this clinic could benefit from an educational program on the importance of medication reconciliation. Awareness of the importance of medication reconciliation by providers may allow providers and MAs to obtain an accurate list of patient's medications upon admission and during follow-up appointments.

### **Intended Improvement**

There are knowledge gaps between providers and staff regarding the importance of MR and their responsibilities during MR (Health Services Advisory Group [HSAG], n.d). Variation and lack of clear ownership of who can collect patient's medication information can lead to poor confidence and diminished patient quality of care. Studies show that an educational program can

help enhance staff's knowledge and improve their performance and enthusiasm during MR (Ramjaun et al., 2015).

One study assessing the staff knowledge of the MR process found that 30% of the staff were not confident in conducting MR in an in-patient setting during admission but after an educational program, 80% of participants reported improving their medication reconciliation procedure (Lester et al., 2019). This study shows that educational programs increase staff and providers' confidence in their MR efforts. The MATCH toolkit supports the need for an educational program to educate providers and staff about the importance of MR (AHRQ, 2012). Consequently, at Bella Vista Clinic, providers and staff could benefit from an educational program about the importance of medication reconciliation. They will be offered options to increase their knowledge about the reconciliation process as well.

### **Project Purpose**

The purpose of this quality improvement (QI) project was to increase providers' and staff's knowledge of the importance of medication reconciliation, present the MATCH toolkit, and assess confidence levels and barriers related to the utilization of the tool.

MATCH is an evidence-based toolkit (Appendix D) developed by the Agency for Healthcare Research and Quality (AHRQ) to enhance the workflow process of medication reconciliation in an organization (Gleason & Brak, 2012). It contains a 7-step process that includes 1) obtaining the leadership's support, 2) determining the project team and scope, 3) designing an MR process, 4) implementing the process in a pilot study, 5) staff education guidance, 6) evaluating and assessing the process, and 7) determination of barriers for medication reconciliation (Gleason & Brak, 2012). This toolkit was initially developed to be

implemented in the in-patient setting; however, it has successfully been implemented in ambulatory and outpatient settings (Gleason & Brak, 2012). The toolkit provides tips and examples on handling specific situations and how an organization can effectively improve its MR process. A link to access the MATCH toolkit is included in Appendix D.

### **Project Question**

Will an evidence-based educational program increase providers' and staff's knowledge about the importance of the medication reconciliation process in an outpatient psychiatric clinic and improve their confidence in conducting MR?

### **Project Aims and Objectives**

This project aimed to increase providers' and staff's knowledge about the importance of medication reconciliation and its impact on patient health outcomes. By completing the educational program providers and staff would also have increased confidence in managing MR. It also identified barriers to the use of the MATCH toolkit. This knowledge may help reduce medication errors and ADEs in this outpatient clinic, and the assessment of barriers may provide insight into effective implementation processes. The following are the objectives of this project:

Objective 1: Provide an educational PowerPoint to providers and staff on the importance of reconciling patients' medications.

Objective 2: Administer a pretest and posttest questionnaire to participants to evaluate if there was an increase in providers' and staff's knowledge on the importance and the process of medication reconciliation, their confidence levels, and any identified barriers to a MR process.

## **Theoretical Framework**

### **Rogers' Diffusion of Innovation Theory**

The theoretical framework that drives this project is Diffusion of Innovation Theory (DOI). When new ideas are brought to an organization, it can take varying amounts of time for the concept to be implemented and adopted by different individuals in the organization (Kaminski, 2011). New ideas or processes are not typically adopted simultaneously by all of those within the system. This framework attempts to explain how new processes are communicated within an organization or a network and whether or not the innovations are accepted (Kaminski, 2011). For example, when a new idea occurs, some individuals could be reluctant to change their daily routine, and those people have different characteristics than those who adopt a change earlier. The DOI theory is one of the more popular theories used as a guide for the implementation of new ideas in the healthcare setting (Lundblad, 2003; Sahin, 2006). This framework has also been utilized in varied settings and disciplines such as history, politics, communications, public health, technology, education, history, etc. (Sahin, 2006).

Rogers believed that change consists of a sequence of events and occurs over time (Rogers, 2003). Understanding these different patterns can help identify the critical variables involved in the process and diffusion of change effectively. Rogers developed the DOI theory in 1962 and posited that the basic structure underlying how changes can be adopted and disseminated within a system is influenced by key elements: innovation, communication, time, and social system (Lundblad, 2003). Rogers defines innovations as ideas, objects, behaviors, or concepts within a system that are perceived as new (Robertson, 1967). Diffusion is defined as how an idea moves across a system (Robertson, 1967). When innovations are developed, the rate

at which they diffuse depends on the communication channel and the system's structure. Also, individual perceptions of the change differ across the system (Rogers, 2003). Many healthcare settings have used this theory as a framework to help guide the implementation of new ideas within their organization (Berwick, 2003).

### **Diffusion of Innovation Key Elements**

#### ***Innovation***

Innovations are new ideas or practices that are perceived as new in a setting.

#### ***Communication***

Communication is how the change moves from one individual or unit to another.

#### ***Time***

Time passing is necessary during the adoption phase; innovations are typically not adopted quickly or simultaneously.

#### ***Social Systems***

There is a combination of influences, both internal and external, that affect innovation (Rogers, 2003).

While attempting to raise awareness (communication) about the importance of a medication reconciliation process at an organization such as Bella Vista, one can use the elements of diffusion of innovation to support the process. The current medication reconciliation process at Bella Vista has been found to be suboptimal; therefore, the DNP student innovated with an evidence-based educational program to educate the providers and staff on the process. Educating about gaps in the current practice could also address uncertainties about the innovation and examine barriers to effective medication reconciliation practices. Emphasizing

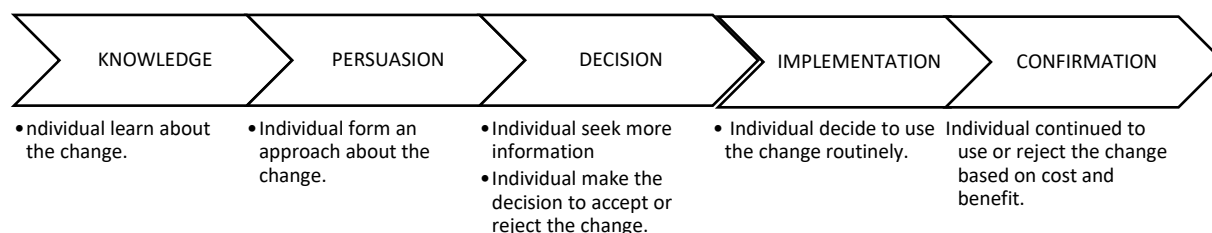
the importance of this process could reduce uncertainty about its utility and increase the likelihood that the facility will decide to adopt a new approach and the communication will spread (Rogers, 2003).

### **Rogers Model of Fives Stages and the MATCH toolkit**

Rogers also discusses the Model of Five Stages in the Innovation-Decision (Figure 1) process as a way to understand an individual's uncertainty and how they proceed to alter their knowledge about a change until the change occurs (Sahin, 2006). The DNP student used this model as a guideline to reduce staff uncertainty about the process of medication reconciliation while also discussing its advantages, which may increase knowledge. The five stages include knowledge, persuasion, decision, implementation, and confirmation and are described in Figure 1.

**Figure 1**

*The Model of Five Stages Applied to the Innovation-Decision Process for Implementing the MATCH Toolkit*



Medication reconciliation may seem complex; however, in the initial knowledge phase of the innovation-decision process, the DNP student evaluated providers' and staff's baseline knowledge on medication reconciliation. The second stage of the innovation-decision process involved educating providers and staff on the importance of medication reconciliation. The third phase assessed whether staff's knowledge about medication reconciliation had increased. Once

well established, the adopters will hopefully see the countless benefits of MR in preventing medication errors, improving the provider's workflow, and eliminating redundancy. The fourth stage reassessed if providers' and staff's knowledge have increased knowledge about the importance of medication reconciliation. Lastly, in the confirmation stage, extra support was provided for late adopters to prevent rejection of the innovation. During all phases, the DNP student used PowerPoint presentations (Appendix E), emails, and questionnaire results as a communication channel to emphasize the need for change.

When attempting to include innovation in an organization, one must ask why some innovations are adopted while others are rejected. Rogers explains that five specific characteristics can facilitate the adoption of innovations (Kaminski, 2011). These were considered when staff were educated about the importance of medication reconciliation. These characteristics are compatibility, trialability, relative advantage, observability, and complexity (Kaminski, 2011). These five characteristics can be further explained as follows: adopters prefer to have a clear view of the results (observability), the innovation must show potential benefits relative to the current practice (comparative advantage), the new idea must be in alignment with the organization or system's values, needs and previous ideas (compatibility), the effort required to use the innovation must be less than the previous practice (trialability), and finally the new idea must be simple and easy to use (complexity) (Kaminski, 2011).

The DNP student anticipated that if more providers and staff became aware of the importance of an effective medication reconciliation process, then a change in practice might follow. For those who have successfully integrated the change, continued encouragement to reconcile their patients' medication was provided. The process may then be more familiar and

spread amongst providers until a saturation point is achieved. At this point, the new knowledge will hopefully be nearly universally accepted at the Bella Vista Clinic.

## Literature Synthesis

### Evidence Search

A literature search was conducted using databases including PsychINFO, PubMed, and Google Scholar. In the PubMed database, the keywords utilized for the systematic search were “*medication reconciliation*,” “*medication errors*,” “*mental health*,” and “*outpatient*.” The search included articles published in the English language. The search terms were “*Medication Reconciliation AND Medication reconciliation*” [MeSH Terms], which yielded 1,184 results, using the advanced search. After removing duplicated articles, the result yielded 1,124 articles. Further restricting the search to articles published between 2016 and 2021 yielded 605 results. Requiring the words “*mental health*” reduced this to three articles. Replacing “*mental health*” with “*psychiatric*” yielded 27 results. Finally, another search was done with the following criteria: “*medication discrepancies*” [All Fields] OR “*reconciliation discrepancies*” [All Fields] OR “*medication reconciliation*” [MeSH Terms] OR “*medication reconciliation*” [All Fields] AND “*impact*” [All Fields] OR “*health outcomes*” [All Fields] OR “*Health Impact Assessment*” [MeSH] AND systematic[*sb*] this yielded 13 articles. The DNP student selected all 43 articles from these three searches for further review (Appendix G).

In the PsychINFO search engine, the keywords “*medication reconciliation*” and “*medication discrepancy*” were selected. The literature search was restricted to full articles published in English between 2016 and 2021, resulting in one article suitable for further review.

In Google Scholar, a search for “*medication reconciliation in mental health outpatient setting*” and articles published between 2016 and 2021 yielded 5,540 articles. After reading few abstracts and ensuring that the article’s full text was accessible, the selection was narrowed to articles discussing MR in the outpatient setting, and three articles were selected.

Of the 43 selected articles from PubMed, one article from PsychINFO, and the three articles from Google Scholar, a total of 15 articles are cited in this project. These articles were selected because they were relevant to the project topic and discussed medication reconciliation in the outpatient setting. These articles are pilot studies, cross-sectional studies, and systematic reviews. Only articles discussing medication reconciliation and the outcome were included in the literature synthesis. Articles that did not have human participants or were only available without the full text were excluded.

Three themes emerged from the literature review: reducing medication errors and medication discrepancies, improved patient care and clinic efficiency, and barriers to reconciliation.

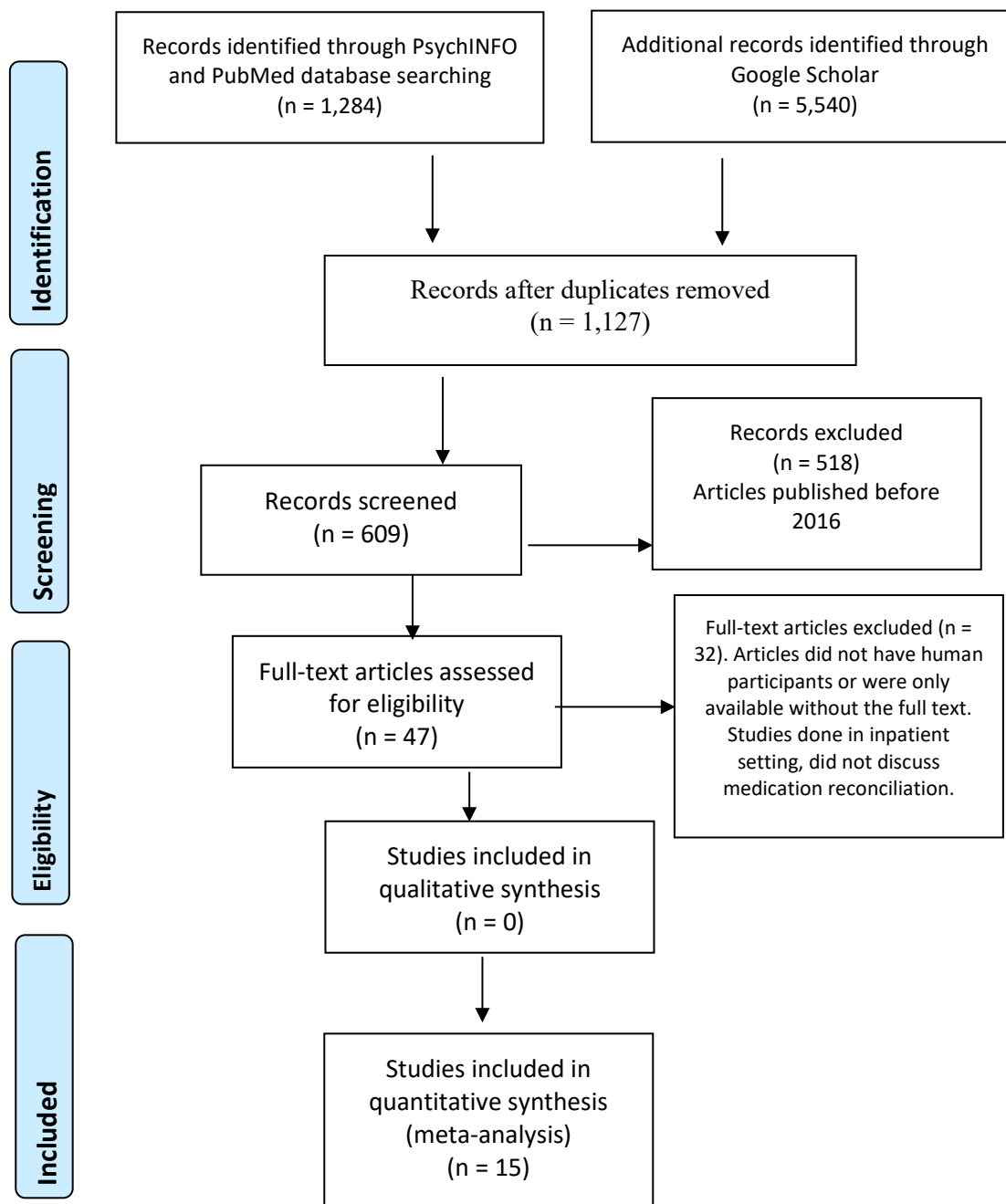
### **Reducing Medication Errors and Medication Discrepancies**

The process of medication reconciliation is shown to be beneficial in preventing medication discrepancies because it allows healthcare providers or other healthcare professionals to identify medication discrepancies during the process of transition in both in-patient and outpatient settings (Almanasreh et al., 2016; Armor et al., 2016; Chiewchantanakit et al., 2020; Choi et al., 2019). Some studies show that medication reconciliation helps in reducing health care utilization by 22%, potential adverse drug events (ADEs) by 10%, and preventable ADEs by

25% (Cheema et al., 2018). These studies show that pharmacists can do this MR process effectively (Cheema et al., 2018).

**Figure 2**

*Literature Review PRISMA Flow Diagram*



A systematic review of medication reconciliation studies shows that many hospital settings have medication discrepancies in their medical records (Cheema et al., 2018). In a study where 43 patients recently discharged from a hospital were seen in a primary care setting, pharmacists recognized 124 potential ADEs and 171 medication discrepancies in those patient's electronic medication records and hospital medication lists (Armor et al., 2016). Many authors also find that coordination with the pharmacy in performing MR reduces adverse drug events (Cheema et al., 2018; Choi & Kim, 2019; Gillani et al., 2020; Mekonnen et al., 2016; Thiruchelvam et al., 2017). One pilot study in an outpatient cancer center shows that when student pharmacists conducted medication reconciliation, they found that at least 88% of patients had medication discrepancies in their medical records (Ashjian et al., 2015). This study also shows that 11.4% of the patients had medication-related problems, causing drug-drug interaction (Ashjian et al., 2015). A systematic medication reconciliation study shows that when pharmacists perform medication reconciliation, the likelihood of medication discrepancy is reduced by 68% (Choi & Kim, 2019). This process is primarily beneficial for patients with comorbidities taking more than one medication.

### **Improved Patient Care and Clinic Efficiency**

Another benefit of medication reconciliation is that it allows patients to participate in their treatment and become more aware of their medications (Choi et al., 2019). One study found that patients involved in medication reconciliation are less likely to miss their appointments (Choi et al., 2019). Lack of appointment adherence is a common issue in mental health settings, especially in rural or underserved areas (Rural Health Information Hub, 2020). Additionally, when a pharmacist's medication reconciliation documentation is available to providers before the

visit, providers reported reducing the time spent reviewing patients' medication lists (Choi et al., 2019). A pilot study conducted in an ambulatory specialty practice found that effective collaboration between healthcare personnel during medication reconciliation can improve practice from 70% to 90% and providers' practice performance from 62% to 91% (Keogh et al., 2016).

### **Barriers to Medication Reconciliation**

Unfortunately, there is no standardized approach to conducting medication reconciliation during transitional care, admission, in-patient settings, or while transferring to outpatient settings (Almanasreh et al., 2016). Given the lack of communication between healthcare providers during the transition of care, there is an elevated risk for medication errors (Armor et al., 2016). To ensure patient safety, a standardized approach may prove helpful to ensure patient safety. One study recognized that medication reconciliation effectively reduces medication errors in ambulatory care and outpatient settings, but comparatively less so in hospital admissions (Chiewchantanakit et al., 2020).

Some systematic review studies find that medication reconciliation has little or no effect in improving patient outcomes or preventing adverse drug events in the long term (Guisado-Gil et al., 2020; McNab et al., 2018; Redmond et al., 2018). In these systematic literature reviews, the authors find a lack of consistency in results concerning how much medication reconciliation reduces healthcare utilization, emergency room visits, length of hospital stays, and readmission (Guisado-Gil et al., 2020; McNab et al., 2018; Redmond et al., 2018). Still, a global view of the literature findings indicates that the positives findings of these literature syntheses outweigh the negative.

A few studies find that medication reconciliation done before a patient's initial visit to a mental health clinic allows healthcare staff to identify and resolve medication discrepancies (Ashjian et al., 2015; Choi et al., 2019; Simoons et al., 2016). One study evaluates the effect of an educational program on the importance of MR on resident physicians in an outpatient pain clinic (Neufeld et al., 2013). This study shows that there is an increase in resident physicians' compliance with MR post-intervention by 89.4% compared to pre-intervention (Neufeld et al., 2013).

The finding from the literature shows that most studies support that MR can reduce potential and preventable ADEs and medication discrepancies. In addition, these studies suggest that including healthcare personnel such as providers, nurses and pharmacists is essential as those individuals have some knowledge of pharmacology and can resolve discrepancies. Given the importance of a well-done MR process, including a standard medication reconciliation form can help maximize the sharing of patient medication history with other personnel.

### **Strengths of the Literature**

Steps were taken to broaden the literature search, increasing the number of articles returned while preserving the relevance of the articles. The *Johns Hopkins Levels of Evidence* (2018) helped categorize the strength of the articles used in this review. Most articles were systematic review studies, pilot studies, or literature reviews. Most were at levels II and III. Level II articles include evidence from both randomized control trials and quasi-experimental studies, and level III articles also include non-experimental evidence, such as qualitative studies and systematic reviews (Dang & Dearholt, 2018).

The literature search for this review included multiple keywords in addition to “*medication reconciliation*.” There was no constraint on the type of clinical setting. Some studies’ clinical setting was the emergency room (Choi & Kim, 2019), others were in the primary care setting, whereas some authors completed their study in outpatient mental health settings (Choi et al., 2019). Another strength of this literature review is that studies included are not limited to the US; for example, Simoons et al. (2016) conducted their study in the Netherlands (Simoons et al., 2016). This provides evidence that the utility of medication reconciliation is not dependent on some peculiarity of the US healthcare system.

### **Limitations of the Literature**

The reviewed studies had several limitations. Some had a small population size, which was not large enough to represent the general population. For example, Armor et al. (2016) only had 43 participants, and Choi et al. (2019) only had six participants. In addition to the population size, some studies’ duration was not long enough to determine the long-term effects of medication reconciliation in preventing adverse medication events (Ashjian et al., 2015; Simoons et al., 2016). Another limitation is the lack of standardized tools or medication list forms used in most studies. For example, some studies used the *Gold Standard Medication List*, whereas others used a different medication list tool (Almanasreh et al., 2016). Another limitation of this literature synthesis was that most articles were written in English and published between 2016 and 2021.

### **Gaps in the Literature**

A systematic review study discusses issues not sufficiently addressed by the studies, where more work is needed. One such gap in knowledge is the lack of solid evidence for whether

medication reconciliation reduces medication discrepancies and medication errors (Guisado-Gil et al., 2020). Nevertheless, many studies find medication reconciliation effective in reducing medication duplication in in-patient settings when done well. Considering that this review is concerned with the outpatient mental health setting, another issue is that relatively few studies are done in outpatient settings and even fewer in mental health. Therefore, more studies need to be done to determine medication reconciliation's usefulness in outpatient mental health settings.

## **METHODS**

### **Project Design**

This DNP project was a quality improvement (QI) project with an educational PowerPoint, pretest, and posttest design. A survey software program called Google survey was used to distribute and analyze the test responses. The DNP student initially collected data regarding the providers and staff's baseline knowledge about the MR process and demographic data. Providers such as psychiatrists, nurse practitioners, and staff such as medical assistants were emailed a pretest questionnaire, including demographic information and questions related to MR, to assess their baseline knowledge about medication reconciliation. Providers and staff were then provided with a 13-slides PowerPoint presentation on the importance of MR. The presentation discussed the process of MR as well as an evidence-based toolkit called MATCH and how it can improve the process of medication reconciliation in this clinic.

The DNP student anticipated that the educational material would expand providers' and staff's confidence in utilizing the MATCH tool at this clinic as well as expanding their knowledge about the importance of MR in reducing medication errors. After providers and staff viewed the PowerPoint presentation, they were asked to take a posttest. The posttest included

three open-ended questions to evaluate the provider's and staff's barriers to utilizing the MATCH toolkit and reconciling their patients' medication. The open-ended questions also gave an opportunity to providers and staff to discuss any possible barriers that could prevent them from effectively reconciling patients' medication. Overall, the purpose of the posttest was to reevaluate the providers' and staff's knowledge about MR after the educational program was provided and assess confidence levels and barriers. Participants had 10 days to view the educational PowerPoint and take the pretest and posttest questionnaires.

This project aimed to improve provider's and staff's knowledge and confidence level about MR. The DNP student anticipated that the educational material would increase providers' knowledge and confidence. As Rogers explained, the rate at which a new idea is adopted depends on the innovation, adopters, communication channels, and social system (Sahin, 2006). The DNP student anticipated that the educational PowerPoint will be an effective communication channel to propagate the intent to change the process of MR. The DNP student hoped that after these ideas for improving MR spread among clinical personnel, over time, more and more providers and staff will adopt the changes and make use of them.

### **Model for Implementation**

The Institute for Healthcare Improvement (IHI)'s triple aims state that healthcare organizations should improve patients' health while reducing costs and improving the patient experience (IHI, 2020). To that end, healthcare organizations should be willing to change.

To promote change in organizations, IHI has established a Model for Improvement (MFI) framework (IHI, 2021) (Figure 3). The MFI is a tool to hasten and guide quality improvement (QI) in an organization. The QI model enables one to develop, test, and implement the change

leading to improvement. The DNP student first addressed the MFI's three fundamental questions and used the Plan-Do-Study-Act (PDSA) cycle to test the change (Figure 4). The PDSA helped the DNP student analyze how providers' and staff understanding of medication reconciliation improved.

### **The Three Fundamental Questions of the MFI**

#### ***Aims***

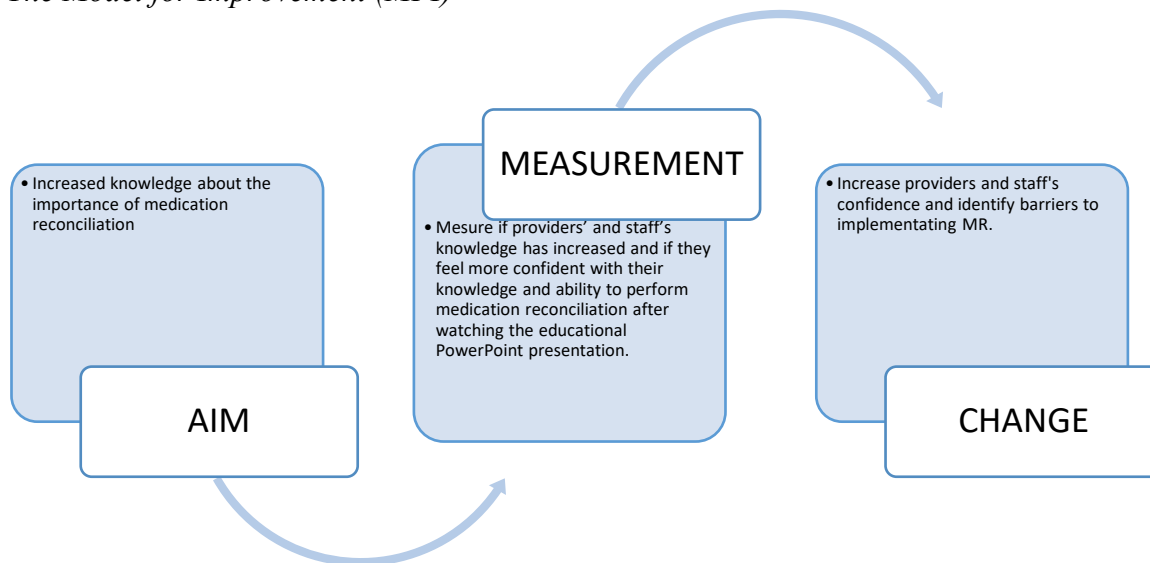
This refers to the aim of the project. The QI project aimed to increase providers' and staff's knowledge on the importance of conducting medication reconciliation by providing an educational intervention.

#### ***Measures (For Outcomes)***

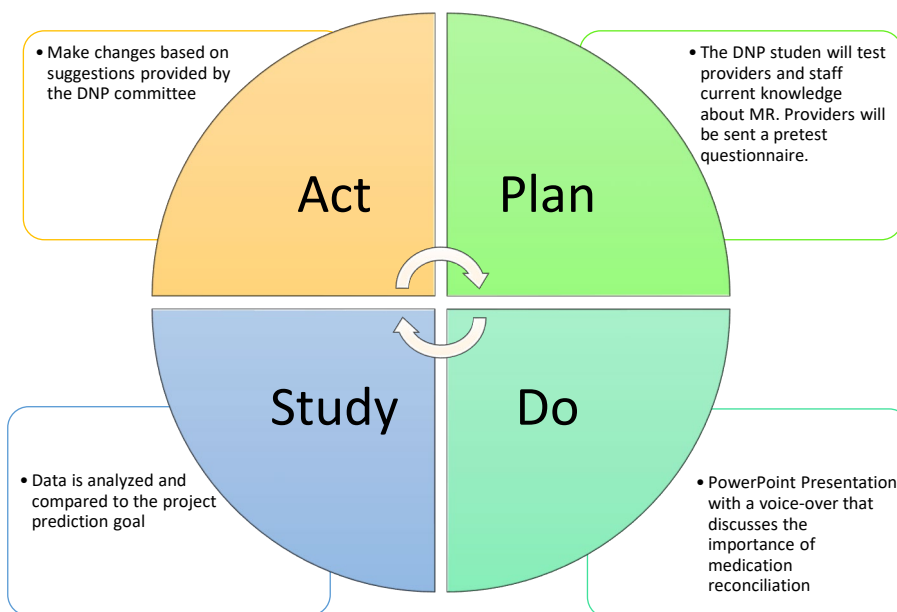
The DNP student used a quantitative measure to assess if providers' and staff's knowledge has increased and if they feel more confident with their knowledge and ability to perform medication reconciliation after watching the educational PowerPoint presentation. Data analysis consisted of comparing pretest and posttest data of staff's perceptions about medication reconciliation. In the posttest, intent to utilize a new medication reconciliation toolkit was assessed. The participants were involved as follows: providers and staff were asked to watch a brief PowerPoint presentation. After viewing the presentation, they were asked to take a posttest questionnaire to assess the change in their knowledge about medication reconciliation.

#### ***Change Made***

The change is for the providers and staff at Bella Vista to understand the importance of accurately performing medication reconciliation, increase their confidence level in performing MR and identify barriers to implementing the MATCH toolkit.

**Figure 3***The Model for Improvement (MFI)***Plan-Do-Study-Act (PDSA) Cycle**

The second part of this project included the Plan-Do-Study-Act (PDSA) cycle. PDSA cycle is a four-step process commonly used for quality improvement. It consists of testing the change in the actual work setting (IHI, 2021a) (Figure 4).

**Figure 4***Plan-Do-Study-Act (PDSA) Cycle****Plan***

The first step is the planning phase. The DNP student asked the questions: who, what, when, and where? In this phase, the objective and possible predictions of the test are stated. The student collected data related to providers and staff current knowledge about MR. Providers were sent a pretest questionnaire via Google survey where they were asked about their current understanding of medication reconciliation. Data from the pretest were collected via Google survey.

***Do***

The second step (Do) of this project is the implementation phase. Providers and staff who completed the pretest were emailed a PowerPoint Presentation with a voice-over that discusses the importance of medication reconciliation. After raising providers' and staff's knowledge,

providers and staff hopefully felt more confident about MR. After viewing the PowerPoint presentation, participants took a posttest to assess their understanding again.

### ***Study***

In this third phase, data were analyzed and compared to the project prediction goal. This analysis determined whether the educational program (PowerPoint) increased providers' and staff's knowledge about the importance of MR. The DNP student carefully analyzed the results and determine what information was helpful and what information was not useful in the presentation. The student identified barriers to the change and evaluated providers' suggestions. The results of the project were presented to the DNP committee members, chief providers, and staff (Appendix H).

### ***Act***

In this last phase, changes are made based on the results of the test. The DNP student made changes based on suggestions provided by the DNP committees. It is possible that most providers will still not see MR as useful in improving patient care. In that case, the student modified the PowerPoint and chose a different strategy for educating providers about the importance of MR.

## **Setting and Stakeholders**

### **Setting**

Bella Vista is located near downtown Phoenix, Arizona. This clinic provides services to patients suffering from psychiatric and medical illnesses in the Phoenix metropolitan area. Given the virtual care services offered in this organization, services can be provided to patients from the entire state of Arizona. Bella Vista is an integrated care organization where underserved patients

can receive psychiatric, medical, and addiction treatment. Patients receive services through a collaborative team of healthcare professionals, physicians (MD), providers (PA, NP, DNP), and therapists. Given that most providers and staff are able to work remotely, this project setting platform was mainly remote, and participants viewed the educational PowerPoint in an asynchronous manner.

### **Stakeholders**

Gaining stakeholder support is essential for the success of a QI project. Stakeholders are individuals who are directly influenced by the project and who can contribute to the success or failure of the QI (Silver et al., 2016). There are different types of stakeholders such as the day-to-day leader, the technical expert, and the clinical leader. When forming a quality improvement team, gaining stakeholders' support as well as taking into consideration each member's role is important (Silver et al., 2016). The DNP student was identified as the team lead or day-to-day leader. The DNP student was responsible for the day-to-day management of the educational material and participation of providers and medical assistants. Providers and medical assistants were identified as technical experts who are directly involved in the process of MR and who will benefit from this educational program. The clinical leader was the clinic manager who understood the importance of this QI project in improving patient care and reducing medication errors.

Recognizing the potential stakeholders such as providers, MAs and clinic supervisor is important for the success of a QI project (Silver et al., 2016). Stakeholders were presented with the importance of MR and the need for a collaborative approach during this process. In addition,

discussing the possibility of increasing staff confidence in reconciling medications was a facilitating factor in requesting their support in this project.

### **Planning the Intervention**

The project implementation was from September 13th through September 24th, 2021. Before implementing this project, a signed site agreement was obtained (Appendix A). In addition, the student received Institutional Review Board (IRB) approval at the University of Arizona on August 16th, with the IRB protocol # 2108124589 (Appendix A). This project was implemented through an online platform, given that most providers are providing telehealth.

This QI project occurred in three steps: the pretest, intervention, and posttest. Prior to the pretest, participants were asked to read and accept a disclosure statement describing the project and the voluntary nature (Appendix B). Each participant had access to the pretest where demographic information was obtained, to the PowerPoint presentation and to the posttest. They were thanked for their time and participation after the tests were completed. The project was done in an asynchronous learning format and is further described in the project process section below.

### **Participants and Recruitment**

Professional team members at this location are family medicine physicians, internal medicine physicians, physician's assistants (PAs), nurse practitioners (NPs), psychiatrists, pediatricians, clinical therapists, and medical assistants (MAs). There was one intake specialist in the psychiatric setting, one psychiatrist, one nurse practitioner (NP), one primary care physician's assistant, and three psychiatric physician's assistants. All the providers and staff worked in collaboration to ensure effective patient care. Potential participants included in this

project were providers who are managing patients' medications and MAs, who are employed at Bella Vista Clinic. All participants were at least 18 years old, read and understood English, and had at least a high school degree. Individuals excluded from this project were therapists, intake specialists, and individuals who are not managing patients' medications.

Participants were recruited via emails sent by the DNP student. Two weeks before the implementation date, on August 30th, the clinic supervisor sent the DNP student's invitation email, project flyer (Appendix C) and the disclosure (Appendix B) form to all potential participants, providers, and MAs via a staff group email. The emails sent to participants contained the project flyer and the disclosure form. The clinic supervisor supported this project by encouraging staff during Bella Vista's monthly meeting to participate in the project. The project flyer contained information about the project objective, the date and time of the intervention, and a brief description of the planned intervention. The DNP student's contact information, phone number, and email address were included in the flyer so participants could contact the DNP student if they have questions. Also, participants were encouraged to provide their work email address if they planned to participate. To recruit as many participants as possible, another email was sent one week before the implementation day and again one day before the implementation day. The recruitment process was done two weeks before the first day of the intervention.

### **Project Process**

On the first day of implementation, September 13th, 2021, participants who showed their interest in the project, and who provided their work email address received a second email containing the educational materials. The educational materials included the pretest link,

PowerPoint presentation with voice over, the posttest link and the copy of the disclosure form. Participants were asked to first take the pretest to evaluate their baseline knowledge about medication reconciliation. Once they completed the pretest, they were asked to watch the PowerPoint presentation which was attached to the email. The PowerPoint presentation contained 13 slides with voice-over. After viewing the PowerPoint presentation, participants were asked to click on the posttest link and complete 10 ten multiple-choice questions. Three open-ended questions were added in the posttest to identify barriers to implementing medication reconciliation and the MATCH toolkit. Participants were informed that the project would be open for ten days.

One week after the project started, a reminder email was sent to all potential participants to encourage those who had not yet participated to submit their survey before the submission deadline, September 24th. Another reminder email was sent again one day before the project ended.

### **Consent and Ethical Considerations**

Ethical considerations are relevant given that human subjects are involved. Before implementing a QI project, one must request an Institutional Review Board (IRB) authorization prior to conducting the project on human participants. The IRB authorization is required to ensure that participants' rights, welfare, and privacy are protected during the research activities (U.S. Food & Drug Administration, 2019). To ensure alignment with the ethical principles of implementing a QI project, this project was submitted to the Institutional Review Board (IRB) for revision and approval at the University of Arizona. Recommendations from the research

ethics board helps to ensure that justice, beneficence, and respect are maintained when conducting a QI project.

### **Justice**

Justice is the ability to treat others fairly, provide resources reasonably and respect individuals' rights and morality (Dixon, 2017). In this QI project, all participants received the same pretest and posttest regardless of their race, sex, or demographic background. In addition, all participants were provided with the same educational materials.

### **Beneficence**

Beneficence is the ability to act in a way that benefits others and prevents harm (Dixon, 2017). This QI project aimed to enhance providers' and staff's knowledge, which could lead to an improvement in providers' and staff's confidence in reconciling patient medications and a reduction in medication errors and ADEs. In addition, providing educational skills could improve the MR process in this clinic and participants' performance. The risks associated with this QI were minimal, given that participants took a pretest and posttest questionnaire in addition to viewing a PowerPoint presentation.

### **Respect**

In the present context, respect means allowing individuals to make sound decisions concerning their lives or health (Dixon, 2017). No one should unfairly influence participants' decisions. Participants should have the right to accept or decline to participate without fear of punishment (Dixon, 2017). In this QI project, participants had the opportunity to accept or decline their participation, or they had the choice to withdraw from the project at any time without fear of punishment. Participants were informed that their responses will be strictly

anonymous and that the results of the test will only be used for this project. Participants were also informed that they can choose not to answer specific questions if they don't feel comfortable. Participants were provided with the ethics information for implementing a QI project and were informed of how all data will be stored. Participants were assured that their email addresses will not be shared with any commercial entities.

### **Data Collection**

Google survey software program was used to send and collect responses. Data were collected in the form of pretest and posttest results from a single group. The surveys were sent via email and participants had 10 days to access the link. Before the pretest was taken, the DNP student collected demographic data of participants such as age, gender, education degree and years of experience. The pretest and posttest contained the same multiple-choice questions and were prepared with guidance from the MATCH toolkit (Gleason & Brak, 2012). The DNP student adapted questions from other QI projects and studies on MR (Lemay et al., 2019). The tests included information from the PowerPoint presentation that was reviewed by an expert. In addition to multiple-choice questions, the posttest had a 5-point Likert scale type open-ended questions to assess the participants' understanding of the process of MR, their confidence level, and possible barriers to implementing MR. The DNP student compared mean scores on the pretest with scores on the posttest.

### **Data Analysis**

The demographic information and score changes were analyzed using descriptive statistics. The variables concerning demographic information are categorical. The Likert scale items were analyzed to assess changes in knowledge with respect to MR. Results were described

in terms of the improvement in test scores for each participant between the pretest and posttest in terms of the mean, standard deviation, median, and range of scores. Each participant's pretest was matched with their posttest based on the time of pre and posttest submission. In addition, each respondent sent an email to the DNP student with their date and time of completion of the pre and posttests. Google Spreadsheets was used to match and organize the test results. The pairing of tests is unambiguous since each posttest time is earlier than the subsequent pretest time.

Test questions were binary variables (correct or incorrect), and a paired samples t-test was used to compare the pretest and posttest scores. This comparison determined whether the educational program on the importance of MR was effective in increasing knowledge. If the p-value for the improvement in scores is greater than 0.05, then the educational presentation will be considered effective. The most salient results are presented graphically in tables and bar charts. The results were made available via the clinic website through an executive summary (Appendix H).

Likert scale questions assessing the confidence level after viewing the presentation are shown in a histogram. Responses to open-ended questions were assessed regarding potential barriers to the implementation of the MATCH tool kit and medication reconciliation. They were described qualitatively in terms of common themes and representative quotes.

## **RESULTS**

After IRB approval was received by the DNP student, the implementation process started on August 30th with recruitment. The clinic supervisor sent an email invitation containing the flyer and disclosure form to all the providers and staff at the clinic. Twelve individuals

responded to the email invitation and provided the DNP student with their work email address, where they received the educational materials. Inclusion criteria were that participants must be at least 18 years old, read and understand English, and have at least a high school degree. Exclusion criteria were being a therapist, intake specialist, or not managing patients' medications. All participants were over the age of 18 and had at least a high school degree. All participants were involved in patients' medication management. Because all responders meet the criteria for the selected population, no participants were excluded.

Participants in the project were either providers or staff at the clinic. Overall, eight participants completed the pretests and posttests out of the 12 participants who received the educational materials. Among the eight participants, four were females, and four were males. Four were ages 36-50, two were ages 18-35, and two were over 51 years old. Four participants had doctorate degrees, two had a master's degree, one had a bachelor's degree, and one had a high school degree. Most participants (62.5%) had less than six years of practice experience, 12.5% had between 6-10 years in practice, and 25% had more than 10 years of practice experience.

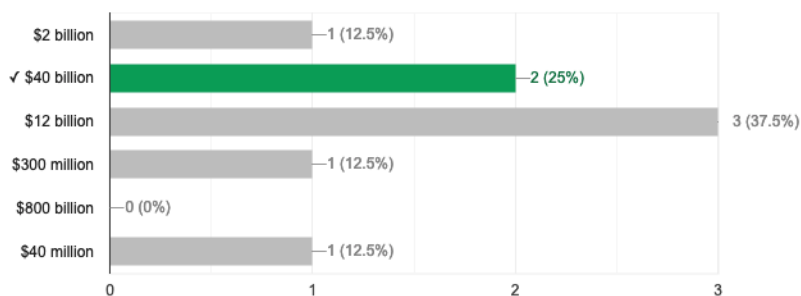
The average pretest score was 8/10. The most frequently missed question was question 5, which asked about the yearly healthcare cost associated with medication errors in the US. Only two participants out of eight answered the question correctly in the pretest (Figure 5). The pretest median was 9/10 points, and the participants' scores ranged from 4 to 9 points where one participant scored 4/10, one scored 7/10, one scored 8/10, and five scored 9/10.

## Figure 5

### *Pretest Answers to Question 5*


5) What is the estimated cost to the US healthcare system associated with medication error each year?

2 / 8 correct responses

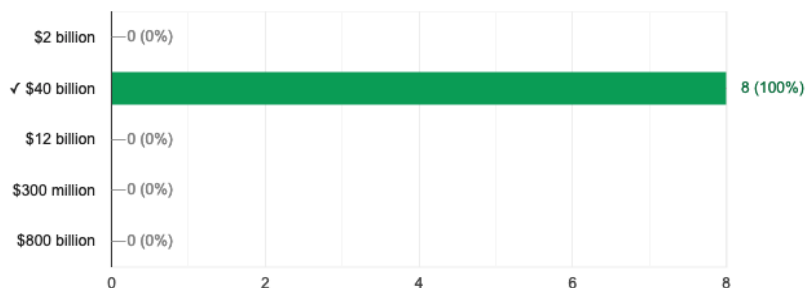


The average score for all participants on the posttest was 9.63/10, and the median was 10/10 points. The posttest scores from all participants ranged from 9 to 10 points, where three participants scored 9/10, and five participants scored 10/10. Question 5 had by far the greatest improvement with only two participants answering correctly on the pretest and all of eight of them getting it right on the posttest (Figure 6). Table 1 provides the complete wording of the questions and the number of participants who answered the question correctly.

**Figure 6***Posttest Answers to Question 5*

5) What is the estimated cost to the US healthcare system associated with medication error each year? 

8 / 8 correct responses

**Table 1**

*Knowledge Assessment Comparing the Correct Answer Percentages for Each Question in the Pretest and Posttest*

Number (%) of Participants with Correct Answer

Question	Pretest (N=8)	Posttest (N=8)
1) Medication reconciliation is ...	7 (87.9)	8 (100)
2) When should medication reconciliation be done?	7 (87.9)	8(100)
3) What can happen if medication reconciliation is not performed?	7 (87.9)	7 (87.9)
4) What percentage of medication errors occur during admission, transition, or discharge?	5(62.5)	8(100)
5) What is the estimated cost to the US healthcare system associated with medication errors each year?	2(25)	8 (100)
6) Which organization mandates medication reconciliation?	8(100)	8(100)
7) Failure to reconcile patient medications can cause all <b>except</b> :	7 (87.9)	8(100)
8) Which of the following is <b>not</b> part of the three-step of medication reconciliation process?	7 (87.9)	8(100)
9) Medication reconciliation is important because	7(87.9)	7(87.9)
10) What is MATCH?	7(87.9)	7(87.9)

When asked whether the PowerPoint presentation was effective in increasing participants understanding about medication reconciliation, most participants answer “yes” and provided reasons why the presentation was useful to them. When asked about potential barriers to effectively reconciling patients’ medications, three participants identified time as a barrier. One participant identified “*time constraints, lack of documentation during the transfer of services*” as barriers from implementing MR. Two participants identified a “*lack of communication*” between providers as another barrier. One participant identified “*polypharmacy, multiple providers, multiple pharmacies*” as barriers, and another participant identified “*time and workflow*” as barriers.

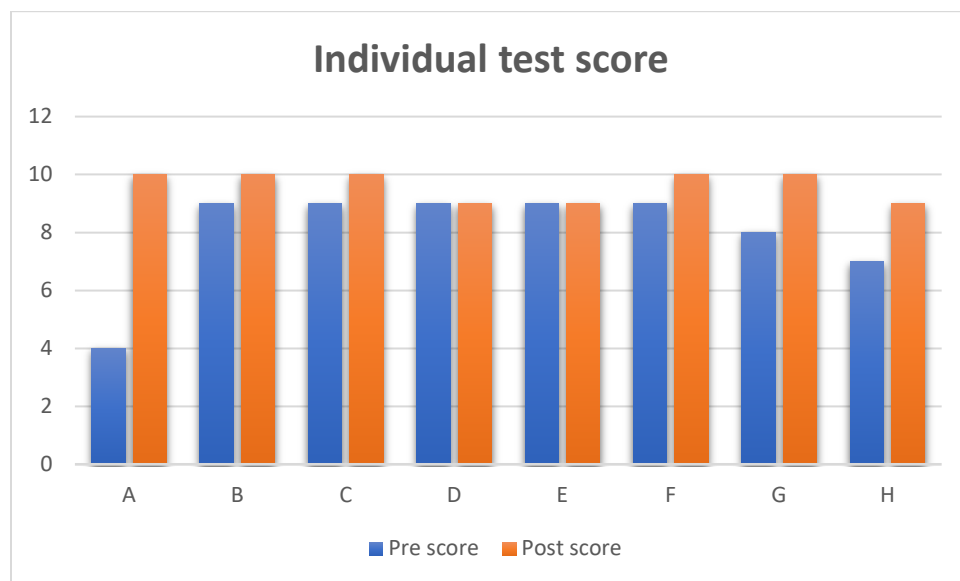
When asked about potential barriers for utilizing the MATCH toolkit at the clinic, four participants identified time as a barrier. One participant identified “*EHR integration*” as a barrier; one participant stated, “*Time and assigning responsibility for implementing the toolkit when employees may already be stretched too thin*” could be a barrier to implementing this toolkit. Another participant reports that “*changing office culture to accommodate new procedures*” could be a barrier to implementing the MATCH toolkit. These responses allow one to identify different barriers to reconciling patients’ medications and implementing a new toolkit. Analysis of the open-ended questions can assist the project director in identifying possible solutions to the barriers. Table 2 provides the complete wording of each participant's response.

**Table 2***Outcome of the Presentation, Barriers for Medication Reconciliation and MATCH Toolkit*

<i>Individual</i>	<i>Has your understanding of medication reconciliation increased due to this presentation? Why or why not?</i>	<i>What are potential barriers to effectively reconciling patient medications at this clinic?</i>	<i>What are some potential barriers for utilizing the MATCH toolkit in this clinic?</i>
<b>A</b>	No	N/A	Not sure
<b>B</b>	Yes, I did not know the statistics. It stresses the importance of implementation	Time	EHR integration
<b>C</b>	Yes, it clarified the cost associated with lack of reconciliation.	Time constraints, lack of documentation during transfer of services	Time constraints, changing office culture to accommodate new procedures
<b>D</b>	Yes. I didn't understand the high cost of poor medication reconciliation.	As discussed in the PowerPoint, the two potential barriers I see are the lack of communication and who is responsible for initiating medication reconciliation.	Time and assigning responsibility for implementation of the toolkit when employees may already be stretched too thin.
<b>E</b>	Yes	Patient's not disclosing ALL their meds	Time
<b>F</b>	Yes, learning stats and details on impacts is so helpful	Polypharmacy, multiple providers, multiple pharmacies	Access
<b>G</b>	Yes. More information about how often it can be missed.	Time, Workflow	Time
<b>H</b>	Yes	Education	n/a

**Project Outcomes****Knowledge Assessment**

Each participant was assigned an alphabetical letter during data analysis. There was an improvement in score when comparing individual pretest and posttest scores and the average group score. Two individuals got the same score on the pretest and posttest, and the remainder scored higher on the posttest (Figure 7).

**Figure 7***Individual Pretest and Posttest Score*

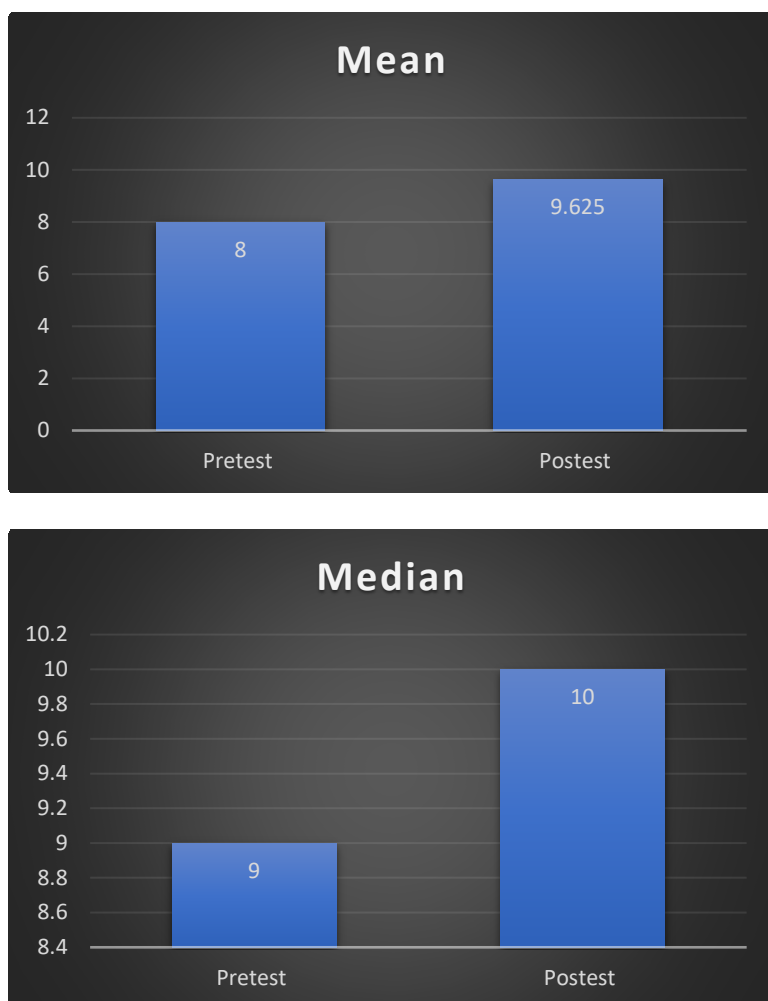
Mean and median scores on the posttest were significantly higher than on the pretest (Figure 8). This indicates that there was an improvement in knowledge due to the educational program. As with the mean test score, the difference in the median score was also greater than ‘0’ (Table 3).

The *t*-test with two dependent means and a two-tailed hypothesis was used to calculate the *p*-value. A *t*-test is “a type of inferential statistic used to determine if there is a significant difference between the means of two groups, which may be related in certain features” (Hayes, 2021 ). The *p*-value is the probability that the null hypothesis is true, or how likely it is that the observed increase in test scores occurred by random chance (Anonymous, 2021). The null hypothesis in this case was that the educational presentation had no effect. A *p*-value less than 0.05 was chosen to show evidence that the null hypothesis should be rejected and that the alternative hypothesis (that participants learned from the presentation) should be accepted. In this

project, a  $p$ -value of 0.04813 was calculated. Since this is less than 0.05, it is interpreted that the educational material is likely effective in improving knowledge among the participants (Table 3).

### Figure 8

*Pretest and Posttest Mean and Median*



**Table 3**

*Comparison of Pretest and Posttest Results Among Participants Who Completed the Tests*

	<b>Pretest</b>	<b>Posttest</b>	<b>Difference (Pretest-Posttest)</b>	<b>p-value</b>
Mean (sd)	8 (1.8)	9.63(0.5)	1.63	0.04813
Median	9	10	1	0.04813

\*Paired t-test  $p < .05$ , two-tailed. \* *sd* - standard deviation

### **Confidence Levels, and Barriers for MR and Implementing the MATCH Toolkit**

When evaluating participant's confidence levels, 62.5% (five participants) felt confident about performing medication reconciliation after watching the PowerPoint presentation (Figure 9). Most participants responded "yes" to the question, "*Has your understanding of medication reconciliation increased due to this presentation? Why or why not?*" One participant responded "no". Most participants expressed feeling more confident about the process of MR after their viewed the educational PowerPoint.

The learning outcomes measured from this project when comparing the pretest and posttest scores suggest knowledge acquisition, an increase in knowledge, and an increase in confidence in participants after they viewed the PowerPoint presentation. Participants also identified barriers to implementing the MATCH toolkit in their future practice. This project demonstrates that an educational program can positively impact knowledge levels about the importance of MR in providers and staff in an outpatient clinic.

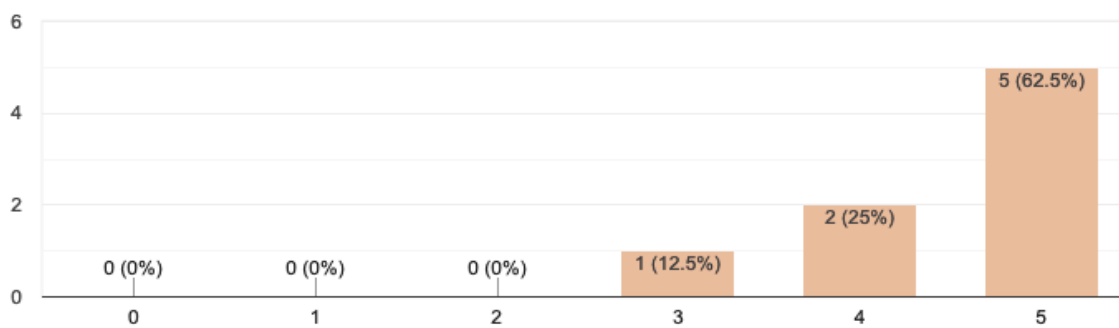
**Figure 9***Participants' Confidence Levels*

Individual	A	B	C	D	E	F	G	H
Confidence Level (0-5 scale)	4	5	5	4	5	5	5	3

11) Confidence level: On a scale of 0 – 5 with 0 being not confident at all and 5 being as confident as possible, rate your confidence in the Medication Reconciliation Process.



8 responses



## DISCUSSION

This project purpose was to increase providers' and staff's knowledge about the importance of MR and to increase their confidence in performing MR. This project successfully reached its goal based on the change in scores between the pretest and posttest group score and individual score. The knowledge increase was achieved using the PowerPoint presentation and was evaluated using the pretest and posttest group scores and individual score. Most participants reported that the education increased their understanding of MR. In addition, most participants were able to identify potential barriers to effectively reconciling patient medications and barriers to utilizing the MATCH toolkit. Overall, this project was successful in increasing providers' and staff's knowledge about the importance of medication reconciliation, improving their confidence

with MR, and allowing providers and staff to identify barriers for reconciling patient medications and implementing the MATCH toolkit.

Medication reconciliation is a complex process at Bella Vista clinic. There is not a straightforward process for MR, nor is there a standard form for MR. Per the literature, taking multiple medications is associated with medication errors, and medications reconciliation has been shown to prevent medications discrepancies and medication errors (Duguid, 2012). The Joint Commission (TJC) recognizes medication reconciliation as their patient safety goal #8, and all health organizations should attempt to reconcile patients' medications during every encounter with the patient (The Joint Commission, 2020). The MATCH toolkit provides a step-by-step processes organization can use to improve their MR procedure. The MATCH tool is publicly available, and it can be used or reprinted without obtaining permission (Gleason & Brak, 2012).

This project was successful in improving providers' and staff's knowledge about the importance of MR. Question 5, which concerned the cost of medication errors, had the most significant improvement. This question had the lowest percentage score (25%) in the pretest; however, all participants answered correctly on the posttest. Five participants scored 10/10 in the posttest after watching the PowerPoint presentation, whereas no one scored 10/10 in the pretest. Based on this, it is very likely that the PowerPoint presentation helped participants improve their scores on the posttest.

Most participants reported that the PowerPoint presentation was useful in increasing their knowledge about MR. The post-intervention Likert scale result indicates that 62.5% of participants reported feeling "100% confident" about performing MR. A preassessment of participants' confidence levels would have been useful in determining whether this intervention

increased their confidence level. It is essential for providers and staff to feel confident about performing medication reconciliation for this process to occur. After viewing the presentation, most participants were also able to identify potential barriers for reconciling patient's medications and implementing the MATCH toolkit.

### **Summary**

The purpose of this QI project was to increase knowledge and confidence level about MR for providers and staff in an outpatient psychiatric clinic and present the MATCH toolkit, which can be used to improve medication reconciliation at the clinic. The educational program appeared to successfully improve providers' and staff's knowledge about the importance of MR based on the change in scores between the pretest and posttest. Participants included providers and MAs. The DNP student developed a PowerPoint presentation that included a voice-over. The PowerPoint presentation discussed the MATCH toolkit as a useful tool to help improve the process of medication reconciliation in an organization. Participants' test scores improved after watching the PowerPoint presentation and many reported an increase in confidence in reconciling patient medications after they viewed the PowerPoint presentation. In addition, many found that this educational project was informative and expressed appreciation for it.

### **Strengths**

A strength of this project was that it was done in an asynchronous manner where participants could choose to take the tests and watch the PowerPoint presentation on their own schedule. Most providers and staff at this clinic have different work schedules, and because of the COVID-19 pandemic, most providers and staff work from home and make virtual appointments. Based on a discussion with the clinic supervisor, it is often difficult for providers

and staff to attend scheduled meetings and educational programs because of their different work schedules. Given the busy schedules of most staff and providers at this clinic, the asynchronous learning platform seems to be a successful way to get them involved in an educational program because of the flexibility in taking the tests and reviewing the PowerPoint presentation at any time.

Another strength of this project is that the PowerPoint presentation had a voice-over, which enhanced the slide's content and provided additional information. Busy adults often prefer content they can listen to or watch without long quiet, stationary sessions in front of the computer (Perkins, 2018). Learning styles and preferences vary from person to person. Adults learn best when they can relate to the learning materials (Russell, 2006), and visual materials can facilitate that. Visual learners learn best by seeing the learning material to process it. Utilizing such visual aids can facilitate learning better than written material alone (Ahmed, 2013). The PowerPoint had a slide with diagrams that allowed participants to visualize the information. Another strength of this project is that it has relatively few pre and posttest questions, which may prevent test fatigue in participants. Questionnaires with too many items can cause fatigue in responders resulting in inaccurate answers. It is preferable for questionnaires to take 10-20 minutes (Choi & Pak, 2005), and this was the case for the questionnaires in this project. Another strength of this project was that the DNP student had support from the clinic supervisor and she encourage staff to participate in this project. Eight providers and medical assistants chose to participate even though no reward was offered.

## **Weaknesses**

A weakness of this project was the total population size. Only eight participants responded to this project which does not represent a majority of the staff at this clinic. Despite the multiple reminders emails the DNP student sent to encourage potential participants to take the tests, relatively few providers and staff participated in this project. To increase the sample size, one might better engage stakeholders by dedicating more time to discussing the project with them. Also, one must clearly communicate the manageable time commitment involved and identify other stakeholders who could be more available to participate in the project such as interns and new hires (AHRQ, 2019).

Another weakness of this project was that pharmacists were not included. Many studies identify pharmacists as qualified staff for performing MR; however, many outpatient settings, such as Bella Vista, do not have pharmacists on-site (Armor et al., 2016; Ashjian et al., 2015; Cheema et al., 2018; Choi & Kim, 2019).

## **Interpretation**

The expectation from this project was to increase providers and staff knowledge about the importance of medication reconciliation. An additional expectation from this project was to increase providers' and staff's confidence levels with MR, identify barriers for reconciling patients' medications and utilizing the MATCH toolkit. The findings from this project indicated a positive change in knowledge based on the pretest and posttest scores for each participant. Many providers reported that they felt confident about the process of medication reconciliation, and many participants identified barriers from reconciling patients' medication and barriers to implementing the MATCH toolkit. Some studies find that providers are often aware of the

importance of medication reconciliation; however, barriers from implementing this process include time constraints, as most participants reported in this project (Boockvar et al., 2011). Addressing these barriers while increasing providers' knowledge about the importance of medication reconciliation could improve the process of MR and patient health outcomes.

### **Implications for Practice, Education, Research and Policy**

#### **Impact of the Project at Bella Vista Clinic**

This educational program provided useful tools such as the medication reconciliation form obtained from the MATCH toolkit that providers and staff could use during admission and follow-up appointments at Bella Vista clinic. Bella Vista clinic is one of the eight clinics of Bayless Integrated Healthcare. Individual clinics can add specific policies applied in their facilities and include case scenarios of medication errors and examples of forms used for medication reconciliation. In addition, this educational PowerPoint can be used as an educational aid in other Bayless clinics to improve knowledge about effective medication reconciliation. Additionally, this project could benefit this practice in assessing barriers to the reconciliation of patients' medications during admission and follow-up. The educational material could be modified to discuss potential barriers at the specific clinic and propose options for managing the barriers.

#### **Education**

A descriptive presentation is imperative to present these educational materials effectively. An experienced session facilitator may choose to edit or redesign content for local needs and institutional policies. For example, some facilities have defined medication reconciliation

templates in their EHRs. Participants reported that the educational module was effective and useful and requested copies of the PPT so they could refer to it in the future.

### **Research and Policy**

The American Nurses Association (ANA) supports the need to improve the process of medication reconciliation, and nurses play a role in promoting this process. DNP prepared students play a role in optimizing the quality of healthcare delivery, and their development and implementation of QI projects are an essential component of their practice. Properly designed and implemented QI projects provide a platform for positive change in health care delivery.

DNP students can also play a role in influencing policy and in changing organizations' protocols to improve care. In the present case, the policy change consists of the implementation of a standardized medication reconciliation form at Bella Vista clinic.

### **Limitations**

There are several limitations to this project. First, this project is a quality improvement (QI) project, not a research project, therefore it is not meant to be generalizable. The goal of this QI is to improve the healthcare service and quality of care at Bella Vista, Bayless Integrated Healthcare. Secondly, the results of this project do not represent all the providers and staff involved in MR in this clinic, given the sample size of eight participants. In addition, the time constraint to implement this project was a limitation. Many people contacted the principal investigator (PI) after the project was complete and those people could have participated if the deadline was not missed. The timely implementation posed a challenge to the quality of this project as the DNP student only allowed 10 business days for participants to take the tests and view the presentation. Finally, this project occurred during the COVID-19 pandemic, most

providers were working from home, and the burden of the pandemic may have discouraged them from participating in this QI project. A larger participation group could have yielded a more significant result between the pretest and posttest results. Perhaps an in-person educational session or reward for participation, such as a gift card, could have encouraged more staff to participate in this quality improvement project.

Another limitation is that the flyer (Appendix C) was sent via group email. Many providers may be overwhelmed with high levels of announcement emails, so they may have passed over the project flyer and the reminder emails, assuming they were relatively unimportant like other announcement emails they received. When reminder emails were sent to participants, some promised to take the pretest and posttest but did not follow through. The DNP student did not divide participants into subgroups; all participants received the same educational material regardless of their educational level. The educational level could have influenced the overall results as most participants had either a doctoral or master's degree, and only two had a bachelor's and high school degree. Anonymizing participants may have made it more likely for participants to be honest and feel less concerned about being judged for incorrect answers.

### **DNP Essentials Addressed**

The Doctor of Nursing Practice (DNP) degree is a terminal degree in the nursing discipline. It is designed to prepare DNP students to apply innovation and evidence-based practice in clinical settings and to play a leadership role. The American Association of College of Nursing (AACN) have developed eight foundational essentials that summarize the competencies and core knowledge that DNP prepared students must acquire in their program regardless of their

specialty (American Association of Colleges of Nursing, 2006). Four of these essentials were met during the completion of this QI project.

### **DNP Essential II – Organizational and Systems Leadership for Quality Improvement and Systems Thinking**

This essential was met when the DNP played the leadership role during the implementation of this QI project. Although the aim of this QI project is to increase providers and MA's knowledge on the importance of MR, the long-term goal is to improve patient outcomes and reduce medication errors (Edwards et al., 2018).

### **DNP Essential III – Clinical Scholarship and Analytical Methods for Evidence-Based Practice**

This essential was met when credible literature findings about the benefits of medication reconciliation were translated and applied into clinical settings. Studies support the effectiveness of MR in reducing medication errors in both inpatient and in ambulatory settings. The MATCH toolkit is an evidence-based toolkit that has been shown to improve the process of MR in various settings. Presenting this toolkit to the Bella Vista clinic will allow stakeholders to consider improving their current process of MR and use this evidence-based tool to support their process. This project also analyzes the effect that an educational program has in improving providers and MA's knowledge on the importance of MR.

### **DNP Essential V – Health Care Policy for Advocacy in Health Care**

This essential was met when this project achieved its goal of presenting the MATCH toolkit, which this clinic can adopt to improve its medication reconciliation process. This essential was also met by the DNP student attempting to influence healthcare policy and showing

how care is delivered in an organization. This project showed that an evidence-based educational program could effectively improve providers' and staffs' knowledge about the importance of medication reconciliation and increase their confidence levels in performing medication reconciliation.

### **DNP Essential VI – Interprofessional Collaboration for Improving Patient and Population Health Outcomes**

DNP Essential VI was met when the DNP student practiced leadership and participated in an interdisciplinary team during the implementation of the project (Edwards et al., 2018). This project identifies MAs and providers as essential staff in the process of medication reconciliation, and effective collaboration between these individuals is essential in improving the process of medication reconciliation and patient safety. The DNP-prepared student demonstrated leadership skills by recognizing the Bella Vista organization's concerns and by leading this QI project while using effective communication skills to communicate with other healthcare professionals. The DNP student provided scholarly evidence to discuss the importance of medication reconciliation in reducing medication errors and involving patients in their care.

### **Conclusions**

This project's purpose was to increase providers' and Staff's knowledge and confidence in MR and introduce the MATCH toolkit to them. A PowerPoint presentation discussed how providers and staff could accurately conduct medication reconciliation in an outpatient setting in an evidence-based manner. The key findings from the pretest and posttest results were that there was an increase in test scores after the participants watched the PowerPoint presentation. Most participants reported a better understanding of the importance of medication reconciliation. Some

felt the PowerPoint was important in increasing their knowledge about the importance of MR as well as their confidence in performing MR, although one reported “*no*” it didn’t improve their knowledge. One participant expressed appreciation for this project because it increased his knowledge about medication errors’ financial impact on the US healthcare system. This project shows that a well-structured educational program can help increase providers’ and MA’s knowledge about the importance of medication reconciliation, increase their confidence level in performing MR, and possibly cause more staff members to appreciate the financial impact medication errors have in the healthcare setting.

### **Plan for Sustainability**

This project could be sustained by providing this clinic with the educational PowerPoint and the MATCH toolkit so that they can continue to use these resources to increase knowledge about the importance of medication reconciliation at Bella Vista. The pretest and posttest results can be presented to the stakeholders to demonstrate the impact of the educational program. The results from the tests show that the information from the PowerPoint presentation improved providers’ and MA’s confidence levels about medication reconciliation. This clinic could benefit from considering the potential barriers to effective MR identified by the staff.

### **Plan for Dissemination**

Because the educational material consists of a PowerPoint presentation, it can easily be shared with other clinics. Stakeholders can encourage providers and staff in different clinics to watch the presentation as a continuing education course to reinforce their knowledge about the importance of medication reconciliation. In addition, Bayless can utilize the MATCH toolkit to improve their medication reconciliation process in other Bayless clinics. Finally, an executive

summary can be provided to the clinic's stakeholders to show this project helped providers and staff better understand MR, identify barriers for reconciling patients' medications and identify possible barriers to implementing the MATCH toolkit (Appendix H). This project also allows providers and staff to feel more confident about performing MR.

### **Funding**

No funding was received for this project.

APPENDIX A:  
SITE APPROVAL/THE UNIVERSITY OF ARIZONA INSTITUTIONAL REVIEW BOARD  
AUTHORIZATION LETTER

**BAYLESS INTEGRATED HEALTHCARE**  
**BELLA VISTA CLINIC**  
**3620 North 3<sup>RD</sup> Street**  
**Phoenix, AZ 85012**

July 14, 2021

University of Arizona Institutional Review

Board c/o Office of Human Subjects

1618 E Helen St

Tucson, AZ 85721

Please note that Ms. Kengne Fosso, UA Doctor of Nursing Practice student, has permission of the Bayless Integrated Healthcare, Bella Vista Clinic to conduct a quality improvement project at our facility for her project, "Medication Reconciliation in an Outpatient psychiatric Health Clinic"

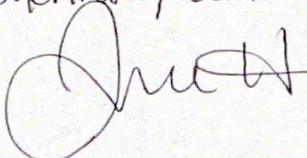
Ms. Kengne Fosso will conduct a survey of health care providers at Bayless Integrated Healthcare, Bella Vista Clinic. She will recruit providers through email. The email will provide a description of the project, what they will be asked to do, the time involved, and a link to the online survey. Ms. Fosso's activities will be completed by December 17<sup>th</sup>, 2021.

Ms. Fosso has agreed to provide to my office a copy of the University of Arizona Determination before she recruits participants. She will also present aggregate results to the providers at their monthly staff meeting.

If there are any questions, please contact my office.

Signed,

Clinic President

Jessica Holiday PMHNP-BC  
psychiatry Clinical Manager  
 PMHNP-BC



Human Subjects  
Protection Program

1618 E. Helen St.  
P.O.Box 245137  
Tucson, AZ 85724-5137  
Tel (520) 626-6721  
<http://hgw.arizona.edu/compliance/home>

**Date:** August 16, 2021  
**Principal Investigator:** Kengne Fosso  


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**Protocol Number:** 2108124589  
**Protocol Title:** MEDICATION RECONCILIATION EDUCATION IN AN  
OUTPATIENT MENTAL HEALTH CLINIC  


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**Determination:** Human Subjects Review not Required

**Documents Reviewed Concurrently:**

**Data Collection Tools:** *KFosso\_PretestPosttest.docx*

**Data Collection Tools:** *MATCH Toolkit.pdf*

**HSPP Forms/Correspondence:** *KFosso\_Determination\_2.pdf*

**Informed Consent/PHI Forms:** *KFosso\_Disclosure form\_2.docx*

**Other Approvals and Authorizations:** *Advisor Confirmation Email (1).pdf*

**Other Approvals and Authorizations:** *KFosso\_Site\_Authorization Letter\_BAYLESS INTEGRATED  
HEALTHCARE, BELLA VISTA.docx*

**Participant Material:** *KFosso\_Participants\_Reminder Email.docx*

**Participant Material:** *KFosso\_Participants\_Second\_Email.docx*

**Participant Material:** *KFosso\_Staff\_Education\_PowerPoint.pptx*

**Recruitment Material:** *KFosso\_Educational\_Program\_Flyer.docx*

**Recruitment Material:** *KFosso\_Recruitment\_Email.docx*

**Regulatory Determinations/Comments:**

- Not Research as defined by 45 CFR 46.102(l): As presented, the activities described above do not meet the definition of research cited in the regulations issued by U.S. Department of Health and Human Services which state that "Research means a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge. Activities that meet this definition constitute research for purposes of this policy, whether or not they are conducted or supported under a program that is considered research for other purposes. For example, some demonstration and service programs may include research activities. For purposes of this part, the following activities are deemed not to be research."

The project listed above does not require oversight by the University of Arizona.

If the nature of the project changes, submit a new determination form to the Human Subjects Protection Program (HSPP) for reassessment. Changes include addition of research with children, specimen collection, participant observation, prospective collection of data when the study was previously retrospective in nature, and broadening the scope or nature of the study activity. Please contact the HSPP to consult on whether the proposed changes need further review.

APPENDIX B:  
CONSENT DOCUMENT (DISCLOSURE FORM AND CONSENT FORM)

### Disclosure form

My name is Kengne Fosso RN-BSN, and I am currently a graduate student at The University of Arizona, in the Doctor of Nursing Practice program, with emphasis on Psychiatric Mental Health Nursing Practice. I am conducting a quality improvement project using a pretest-posttest design to assess the staff knowledge about the importance of medication reconciliation. I am inviting psychiatric health providers and medical assistances to participate as they play an important role in reconciling patients' medication.

**The primary purpose of this project is to increase providers' and staff's knowledge of the importance of medication reconciliation guided by the MATCH (Medication at Transition and Clinical Handoffs) toolkit.**

Participation in this project is voluntary. The members have the right to refuse to participate, give information, and withdraw from the educational session at any given time. Please remember that the questionnaire response will remain anonymous.

If you choose to take part in this project, you will be asked to complete three significant steps:

- **Step one:** Please complete an anonymous *pretest online survey* about medication reconciliation. This is to be completed *before* starting the recorded PowerPoint presentation.
- **Step two:** Watch the 13-slides recorded PowerPoint presentation with voice over. The content will cover the following objectives: Background information about how medication error affect patient health outcome. The impact of medication error in the health system and how medication reconciliation can be conduct. What are the common barriers of medication reconciliation in psychiatric health settings and what need to be done? Finally step used in the MATCH toolkit on how to improve the process of medication reconciliation in a facility is provided.
- **Step three:** Please complete an anonymous *posttest online questionnaire* about the medication reconciliation. This is to be completed *after* watching the recorded PowerPoint presentation.

It will take approximately seven minutes to complete the described questionnaire. There are no foreseeable risks associated with participating in this project, and you will receive no immediate benefit from your participation. Responses are anonymous.

If you choose to participate in the project, participation is voluntary, refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw at any time from the project. In addition, you may skip any question that you choose not to answer. By participating, you do not give up any personal legal rights you may have as a participant in this project.

For questions, concerns, or complaints about the project, you may call Kengne Fosso RN-BSN, DNP-PMHNP student at 602-366-9682 or email [kfosso@email.arizona.edu](mailto:kfosso@email.arizona.edu)

Thank you for your time and consideration.

Warm Regards,

Kengne Fosso RN-BSN, DNP-PMHNP student

APPENDIX C:  
RECRUITMENT MATERIAL (RECRUITMENT FLYER)

# Medication Reconciliation and MATCH toolkit

**Presenter:** Kengne Fosso RN-BSN, DNP-PMHNP Student

**Where:** Online platform. PowerPoint education, pretest, and posttest questionnaires will be sent to participants via email.

**When:** September 13-14, 2021

**Objective:** Reinforce knowledge about the importance of medication reconciliation in psychiatric health and discuss the MATCH toolkit

**Recruiting:** Psychiatric providers and medical assistances

**Time to complete online education:** TBD

A 13-slide prerecorded education PowerPoint will be sent to psychiatric providers and medical assistances to discuss the importance of medication reconciliation. Staff will be asked to complete a pretest and posttest questionnaire to evaluate their knowledge gained from the presentation. The education PowerPoint will be sent via email, where participants will have ten business days to access the PowerPoint and complete the pre and posttest questionnaires. All participant's information will be confidential.

APPENDIX D:  
EVALUATION INSTRUMENTS (MATCH TOOL KIT LINK/DEMOGRAPHIC  
INFORMATION/PRETEST/POSTTEST/OPEN-ENDED QUESTIONS)

<https://www.ahrq.gov/sites/default/files/publications/files/match.pdf>

**Demographic Information** (administered during pretest)

## 1. Age

(1) 18-35      (2) 36-50      (3) >51

## 2. Gender

(1) Female      (2) Male      (3) Other

## 3. Highest Level of Education

(1) High School Degree (2) bachelor's degree (3) Masters      (4) Doctorate

## 4. Years in Practice

(1) 0-5      (2) 6-10      (3) >10

## PRETEST

- 1) Medication reconciliation is:
  - a) Telling the patient all the medications they are taking.
  - b) Validating the list of medications by checking that at least 50% of providers approve of them given the patient's medical condition and history.
  - c) Obtaining, verifying, and documenting a list of the patient's current medications and comparing this list to the medication orders.
  - d) Making sure the pills in the patient's medication bottle are the same as before.
- 2) When should medication reconciliation be done?
  - a) On admission
  - b) At a follow-up appointment
  - c) At discharge
  - d) A and C
  - e) All the above
- 3) What can happen if medication reconciliation is not performed?
  - a) Medication duplication, medications errors, medication discrepancies, and hospitalizations can occur.
  - b) Patients will be more involved in their treatment.
  - c) Patient health conditions will be improved quickly.
  - d) Organizations could be punished.

- 4) What percentage of medication errors occur during admission, transition or discharge?
  - a) 60%
  - b) 20%
  - c) 10%
  - d) 50%
  
- 5) What is the estimated cost to the US healthcare system associated with medication error each year?
  - a) \$2 billion
  - b) \$40 billion
  - c) \$12 billion
  - d) \$300 billion
  - e) \$800 billion
  
- 6) Which organization mandates medication reconciliation?
  - a) The Occupational Safety and Health Administration (OSHA).
  - b) The Center for Disease Control (CDC).
  - c) The Joint Commission on Accreditation of Healthcare Organizations (JCAHO).
  - d) The Institute for Healthcare Improvement (IHI).
  
- 7) Failure to reconcile patient medications can cause all **except**:
  - a) Medication duplication.
  - b) Organization financial impact.
  - c) Worsening of mental health conditions.
  - d) Patients becoming more involved in their treatment.

8) Which of the following is **not** part of the three-step of medication reconciliation process?

- a) Clarification (Making sure the medication and dose are accurate).
- b) Reconciliation (Documenting every single change and making it aligned with other medication information).
- c) Observing (Making sure patient takes all medications by mouth).
- d) Verification (Obtaining accurate medication history).

9) Medication reconciliation is important because

- a) It is easy to implement in most healthcare organizations.
- b) It helps reduce medication discrepancies in outpatient settings.
- c) It prevents an individual from getting sick.
- d) It is mandated by the FDA.

10) What is the MATCH?

- a) An informed consent form to implement medication reconciliation in an organization.
- b) A medication reconciliation form developed to collect patient medication information.
- c) A toolkit to enhance the workflow process of medication reconciliation in an organization.
- d) A medication questionnaire to give to patients.

11) Confidence level: On a scale of 0 – 5 with 0 being not confident at all and 5 being as confident as possible, rate your confidence in the Medication Reconciliation Process.

0      1      2      3      4      5

## POSTTEST

- 1) Medication reconciliation is:
  - a. Telling the patient all the medications they are taking.
  - b. Validating the list of medications by checking that at least 50% of providers approve of them given the patient's medical condition and history.
  - c. Obtaining, verifying, and documenting a list of the patient's current medications and comparing this list to the medication orders.
  - d. Making sure the pills in the patient's medication bottle are the same as before.
- 2) When should medication reconciliation be done?
  - a. On admission
  - b. At a follow-up appointment
  - c. At discharge
  - d. A and C
  - e. All the above
- 3) What can happen if medication reconciliation is not performed?
  - a. Medication duplication, medications errors, medication discrepancies, and hospitalizations can occur.
  - b. Patients will be more involved in their treatment.
  - c. Patient health conditions will be improved quickly.
  - d. Organizations could be punished

- 4) What percentage of medication errors occur during admission, transition or discharge?
  - a. 60%
  - b. 20%
  - c. 10%
  - d. 50%
  
- 5) What is the estimated cost to the US healthcare system associated with medication error each year?
  - a. \$70 million
  - b. \$40 billion
  - c. \$6 billion
  - d. \$300 billion
  
- 6) Which organization mandates medication reconciliation?
  - a. The Occupational Safety and Health Administration (OSHA).
  - b. The Center for Disease Control (CDC).
  - c. The Joint Commission on Accreditation of Healthcare Organizations (JCAHO).
  - d. The Institute for Healthcare Improvement (IHI).
  
- 7) Failure to reconcile patient medications can cause all **except**:
  - a. Medication duplication.
  - b. Organization financial impact.
  - c. Worsening of mental health conditions.
  - d. Patients becoming more involved in their treatment.

8) Which of the following is **not** part of the three-step of medication reconciliation process?

- a. Clarification (Making sure the medication and dose are accurate).
- b. Reconciliation (Documenting every single change and making it aligned with other medication information).
- c. Observing (Making sure patient takes all medications by mouth).
- d. Verification (Obtaining accurate medication history).

9) Medication reconciliation is important because

- a. It is easy to implement in most healthcare organizations.
- b. It helps reduce medication discrepancies in outpatient settings.
- c. It prevents an individual from getting sick.
- d. It is mandated by the FDA.

10) What is the MATCH?

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- c. A toolkit to enhance the workflow process of medication reconciliation in an organization.
- d. A medication questionnaire to give to patients

11) Confidence level: On a scale of 0 – 5, with 0 being not confident at all and 5 being as confident as possible, rate your confidence in the Medication Reconciliation Process?

0      1      2      3      4      5

**Open-ended questions**

- 12) Has your understanding of medication reconciliation increased due to this presentation?  
Why or why not?
- 13) What are potential barriers to effectively reconciling patient medications at this clinic?
- 14) What are the potential barriers to utilizing the MATCH toolkit?

APPENDIX E:  
PARTICIPANT MATERIAL (POWERPOINT PRESENTATION)



# MEDICATION RECONCILIATION

By Kengne Fosso  
RN-BSN, PMHNP student



1

## Introduction

- 60% of medication errors occur during admission, transition, or discharge.
- 30% of medication errors can cause harm to patients.
- 250,000 annual deaths were related to medication errors in 2016.
- 1 in 5 adults between the ages of 40-79 have used at least five medications simultaneously at some point in life.

(Duguid, 2012; Hales et al., 2019; Kreckman et al., 2018)

2

## Objectives

- Identify components of an accurate medication reconciliation
- Identify benefits of medication reconciliation
- Identify challenges associated with medication reconciliation
- Identify steps to improve medication reconciliation in the clinic

3

3

## Risks Factors and Significance of Medication Errors

- Risk factors
  - Taking multiple medications
  - Advanced age
  - Chronic disease such as psychiatric disease
  - Comorbid disease
- Medication errors are an economic burden.
  - Associated costs reach approximately \$40 billion to the health care system each year.
  - Worsening of health conditions
  - Increased hospitalizations

(Tariq et al., 2020 ; NCCMERF, 2021)

4

4

## National Patient Safety Goal #8 (NPSG)

(NPSG.03.06.01)

1. Obtain an accurate medication history of all the medications the patient is currently taking when he or she is admitted to the hospital or is seen in an outpatient setting.
  - Information should include prescribed schedule and as-needed medications.
  - Obtain information from patient or other sources.
2. Obtain medication name, dose, route, frequency, purpose.
3. Compare current medications with prescribed medications and identify discrepancies.
4. Provide patient with an updated list of medications at the end of the outpatient encounter.
5. Explain the importance of medication information management.

(The Joint Commission, 2020)

5

5

## Benefits of Medication Reconciliation

- Reduce Adverse Drugs Events (ADEs)
- Reduce medication discrepancies
- Reduce hospital admissions
- Improve patient safety
- Encourage patient to participate in their treatment

(McCarthy et al., 2016; Choi et al., 2019)

6

6

### **Benefits of Medication Reconciliation**

- Can detect up to 85% of medication discrepancies[1]
- \$146,250 annual net savings at a Minnesota hospital[1]
- 2,382 harmful medication errors avoided per year in 2005 at the University of Wisconsin Hospital and Clinics[2]
- Annual net savings/cost avoidance of 11.4 million at the University of Wisconsin Hospital and Clinics[2]

[1]Model by Steven Meisel at the Fairview Health Services in Minneapolis, Minnesota

[2]Model by Steve Rough (pharmacy-obtained medication history and reconciliation) at the University of Wisconsin Hospital and Clinics  
(Gleason & Brak, 2012)

7

7

### **Barriers to Medication Reconciliation**

- No clear ownership in this process
  - MA, nurse, APRN, doctor
- No standardized medication reconciliation form
- Intake complexity (time)
- Patient (poor historian)
- Difference in EHR systems
- Limited studies in outpatient settings

(Barnsteiner, 2008)

8

8

## MATCH TOOLKIT

- Evidence-based toolkit developed with the support of the Agency for Healthcare Research and Quality (AHRQ)
  - 1) Gain leadership's support
  - 2) Determine project team and scope
  - 3) Design a medication reconciliation process
  - 4) Implement the new process in a pilot study
  - 5) Educate and train staff
  - 6) Evaluate and assess the new process
  - 7) Determine any barriers to medication reconciliation

Website

<https://www.ahrq.gov/sites/default/files/publications/files/match.pdf>

9

(Gleason & Brak, 2012)

9

## Medication Reconciliation Process

- Define clear ownership in this process
  - Encourage communication between healthcare staff
- Develop a process
- Adopt or develop a standard medication reconciliation form
- Engage patient in the process

10

(Gleason & Brak, 2012)

10

## Medication Reconciliation Process

- Define clear ownership in this process
  - Encourage communication between healthcare staff
- Develop a clear process of reconciling patient's medications
- Adopt or develop a standard medication reconciliation form
- Engage patient in the process

Patient Name: \_\_\_\_\_  
MR#: \_\_\_\_\_  
Date: \_\_\_\_\_  
Fin #: \_\_\_\_\_

[Insert your Organization's Logo Here]

Your Current Medication List (Name \_\_\_\_\_)

Please complete the following information. A registered nurse will review this list and update it, if needed, when you arrive for your surgery, procedure, or test.

ALLERGIES: None \_\_\_\_\_ (please check none) or list:

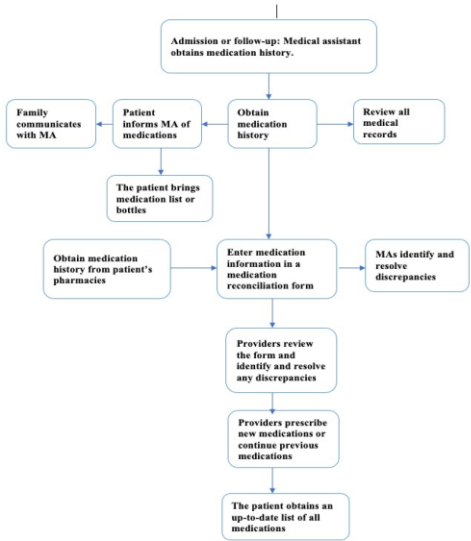
Source of Allergy	Reaction	Source of Allergy	Reaction
Example: Penicillin	Hives	3.	
1.		4.	
2.		5.	

Medication	Strength	Dose	Frequency	Route	Last Dose Taken
<small>List the names of any medications you are taking. Please include any over the counter medicines (including vitamins, minerals, and herbal supplements). Also include any medications you hold for your procedure.</small>	<small>List the strength of each tablet, capsule, etc.</small>	<small>How much are you taking?</small>	<small>How often do you take the medication? (daily, twice a day, monthly, etc.)</small>	<small>How are you taking the medication? (By mouth, injection, patch, etc.)</small>	<small>Indicate the date and time of the last dose taken.</small>
Example: Tylenol XL	100mg	1 tablet	every day	by mouth	this morning

(Gleason & Brak, 2012)



Medication Reconciliation flow chart



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APPENDIX F:  
PROJECT TIMELINE

<b>Completion Date</b>	<b>Planning</b>	<b>Pre-Implementation</b>	<b>Implementation</b>	<b>Evaluation</b>
August 16 <sup>t</sup>	Obtain site authorization letter			
July 26 <sup>th</sup> 2021	Submit DNP Proposal to chair and committees			
August 06 <sup>th</sup> 2021		Proposal Defense		
August 16 <sup>th</sup> 2021		Obtain IRB approval		
August 30 <sup>th</sup> - September 24 <sup>th</sup> 2021			Implementation and Data collection	
September 25 <sup>th</sup> 2021				Data Analyze
November 08 <sup>th</sup> 2021				<b>Final Defense Presentation of Project Results</b>

APPENDIX G:  
LITERATURE REVIEW GRID

Project Question: Will an evidence-based educational program increase providers' and MA's knowledge about the importance of the medication reconciliation process in an outpatient psychiatric clinic?

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
2016- Almanaresh & Chen	The medication reconciliation process and classification of discrepancies: a systematic review	Systematic review	This article provided the different definitions of medication reconciliation from different organizations: the WHO, TJC and IHI. Differences in definitions also suggest differences in process. However, no matter the definition used, medication reconciliation appears to be a complex process.	Identifying and classifying medication discrepancies such as determining the cause, type and prevalence is an important step in the process of medication reconciliation. This could help in measuring the influence medication reconciliation has in patient safety. Authors defined medication reconciliation as creating the most accurate medication list possible by using patient interviews, medication bottles, pharmacies, and other healthcare sources.  There is a need for gold standard medication reconciliation tools or guidelines to help in its implementation. There is a lack of studies supporting the effectiveness of medication reconciliation. It is possible that this is due to a lack of standardized medication reconciliation processes.
2016- Armor	Evaluation of Adverse Drug Events and Medication Discrepancies in Transitions of Care Between Hospital Discharge and Primary Care Follow-Up	Retrospective, observational pilot study	In 43 patients recently discharged from a hospital and who were seen in a primary care setting, pharmacists recognized 124 potential adverse drug events and 171 medication discrepancies in patient electronic medication records and hospital medication lists. This study concluded that an average of 3.9 medication discrepancies and 2.9 potential adverse	In this study pharmacists spent on average 70 minutes to complete the process of medication reconciliation. This study discusses the need for medication recognition reconciliation during the transition of care from in-patient to outpatient care, noting a lack of communication between in-patient and outpatient organizations. It also discusses

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
			<p>drugs event were identified per patient. In this study, 11% of all adverse drugs events were associated with psychiatric medications.</p>	<p>the role that pharmacists play in this process in recognizing medication discrepancies.</p> <p>Inconsistency in discharge instructions from hospitals and incomplete medication lists were identified as barriers to medications reconciliation.</p> <p>An educational intervention is necessary for patients to prevent patient readmission and medication errors.</p>
2015- Ashjian	Evaluation of outpatient medication reconciliation involving student pharmacists at a comprehensive cancer center	Pilot study	<p>In this study, 19 pharmacy students reviewed 510 patient medical records (MR) in an outpatient cancer center. At least one medication discrepancy was identified per patient MR Medications discrepancies included dose changes (508), additional medications (499), additional herbal products (130), and presence of discontinued medications (638). 11.4% of the patients had medication related problems caused by either drug-drug interactions or untreated indications.</p>	<p>This study finds that medication discrepancies are prevalent in outpatient setting and can cause medication related problems if not recognized and resolved. This study also shows that pharmacist play an important role in recognizing medication errors during medication reconciliation.</p>

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
2018- Cheema	The impact of pharmacist-led medicines reconciliation on healthcare outcomes in secondary care: A systematic review and meta-analysis of randomized controlled trials	Systematic review study	This study shows the effectiveness of medication reconciliation.  Four studies show that when medication reconciliation is done it reduces healthcare utilization by 22%, three studies show a reduction in potential Adverse Drug Events (ADE) by 10%, and three studies show a reduction of preventable ADE by 25%.	The findings of this systematic review study show the benefit of medication reconciliation in reducing medication discrepancies.
2020- Chiewchantanakit	The effectiveness of medication reconciliation to prevent medication error: A systematic review and meta-analysis	Systematic review study	This study included 7 articles involving 1581 participants. The results of this review show that patients who received MR had medication errors reduced by 75%. In addition, MR was recognized as important when done in the ambulatory setting however it appears to commonly happen in in-patient setting.	This study shows the effectiveness of medication reconciliation in reducing medication errors in ambulatory care.
2019- Choi	The Impact of Completing Medication Reconciliation and Depression Treatment History in an Outpatient Depression Clinic	Pilot study	This study finds, because of medication reconciliation, most participants (113 participants) had at least 4-5 medication discrepancies. That said, more than 96% of participants had at least one medication discrepancy. 1/3 of the discrepancies were consider clinically significant.	This study shows that when medication reconciliation is done prior to a patient's initial visit to a mental health clinic, pharmacists were able to identify and resolve multiple medication discrepancies. This process also reduces the patient no-show rate by 2.9%.
2019- Choi & Kim	Effect of pharmacy-led medication reconciliation in emergency departments: A	Systematic review study	This study shows that when medication reconciliation is done by pharmacists, the rate of medication discrepancy is reduced by 68%.	This study also supports the importance of pharmacist-led medication reconciliation. Having the appropriate healthcare professionals in the right roles in the

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
	systematic review and meta-analysis			process of medication reconciliation is important.
2020- Gillani	Role and Services of Pharmacists in the Prevention of Medication Errors: A Systematic Review.	Systematic review study	This systematic review study also discussed the important of pharmacists in the process of medication reconciliation during discharge. Many studies suggest that medication discrepancies often occur during patient discharge. The role of the pharmacist is to reconcile medications during discharge.	Pharmacists play an important role during patient discharge. When pharmacists are involved in medication reconciliation at discharge, there is a decrease in medication discrepancies.
2020- Guisado-Gil	Impact of medication reconciliation on health outcomes: An overview of systematic reviews	Systematic review study	This review includes 5 studies. Of these studies 2 had low quality and 3 had very low quality. The meta-analysis of these studies shows that most studies were not statistically significant in showing the effect of medication reconciliation in reducing healthcare utilization.	This study finds that many studies are not reliable in showing the effectiveness of medication reconciliation in reducing reduce ADE or medication discrepancies.
2016- Keogh	Ambulatory Medication Reconciliation: Using a Collaborative Approach to Process Improvement at an Academic Medical Center.	Pilot study	This study shows that effective collaboration between healthcare personnel and implementation of medication reconciliation in an ambulatory specialty practice improves specialty practice from 70% to 90%, provider practice performance from 62% to 91.	In addition to improving patient care and patient safety, this study shows that provider performance can also be improved when medication reconciliation is implemented in ambulatory settings.
2018- McNab	Systematic review and meta-analysis of the effectiveness of pharmacist-led medication reconciliation	Systematic review study	This systematic review aims to determine the importance of pharmacist-led medication reconciliation in reducing readmission after hospital discharge. In this review, 3 studies show a statistically	Most studies show the importance of pharmacists in the process of medication reconciliation. Some studies did not support the effectiveness of pharmacists in

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
	in the community after hospital discharge		significant reduction in hospital admission when MR is conducted by a pharmacist. However, one study did not show a reduction in hospital readmission. Other studies show readmission rates at different time scales.	preventing hospital readmission in the long-term.
2012- Procyshyn, Barr, Brickell, Honer	Medication errors in psychiatry	Literature review	<p>The authors identify different factors that contribute to the occurrence of medication errors in mental health settings which are due to patients, providers, and are system related.</p> <p>Mental health treatment can be complex and factors that add to this complexity include polypharmacy, multiple prescribers, comorbid mental illnesses, substance abuse, and lack of compliance.</p> <p>Hospital admissions are often the result of adverse medication events.</p>	<p>Causes of medication error include patients' failure to report medications they are taking and possible psychiatric illness symptoms.</p> <p>Mandating medication reconciliation programs for mental health organizations could reduce medication errors.</p> <p>Providing patients with a list of medications could add a safeguard to the process of medication reconciliation. Pharmacists play an important role in the process of medication reconciliation and they could perform this task instead of nurses.</p>
2018-Redmond	Impact of medication reconciliation for improving transitions of care	Systematic review study	This systematic review study uses 25 studies to compare the effect of medication reconciliation in decreasing ADE when patients transition between healthcare settings with usual standard care. In most studies, the statistical significance of the effect of medication reconciliation in reducing or preventing medication discrepancy was very low.	This systematic review study shows that there is only weak evidence that medication reconciliation reduces ADE, medication discrepancies, and hospital utilization when patients transition between healthcare settings. In addition, most studies only include pharmacists as the mediator efforts in this process, therefore the long-term effect is not clear if

<b>Pub. Year; Author's Last Name</b>	<b>Title of Publication</b>	<b>Type of Study</b>	<b>Main Outcomes of Findings</b>	<b>Support For and or Link to Project</b>
				this process is done by other healthcare professionals.
2017- Thiruchelvam	Residential Aged Care Medication Review to Improve the Quality of Medication Use: A Systematic Review.	Systematic review study	The review of 11 studies shows that medication review done in aged care facilities can reduce the number of deaths related to inappropriate prescriptions, medication-related problems, inappropriate medication uses, and medication errors. One study shows that medication review can also improve medication adherence.	This study presents the effect of medication review in aged care facilities. Elderly patients are at risk for polypharmacy.
2016- Simoons	Medication Discrepancies at Outpatient Departments for Mood and Anxiety Disorders in the Netherlands: Risks and Clinical Relevance	Cross-sectional study	<p>This study identifies the risk of medication discrepancies occurring during patient visits in an outpatient clinic. The study finds that most patients (94%) have forgotten to report at least one medication that they are taking on a regular basis.</p> <p>Failing to report all medications poses a major health risk to patients with mood and anxiety disorders and could affect their treatment. This study concludes that medication reconciliation is badly needed in the outpatient setting.</p>	This study shows that medication discrepancies are likely to occur in outpatient mental health settings, therefore there is a need to perform medication reconciliation in these settings.

APPENDIX H:  
DNP EXECUTIVE SUMMARY

## DNP EXECUTIVE SUMMARY

**Type:** DNP Project

**Research Approach:** Quality Improvement Project

**Title:** Medication Reconciliation Education in an Outpatient Mental Health Clinic

**Author:** Kengne Fosso RN-BSN DNP-PMHNP student

**Advisor:** Dr. Edmund, Sara DNP, R.N., FNP-C, PMHNP-BC

**Year:** 2021

**School:** The University of Arizona

**Abstract:** Purpose: Medication errors are the third leading cause of death in the United States. Medication errors are considered preventable and are often the result of improper medication reconciliation. Given the increased rate of polypharmacy, mental health patients in outpatient settings are at high risk for medication errors. This quality improvement project aimed to enhance providers' and medical assistants' knowledge about the importance of medication reconciliation at a local outpatient mental health clinic called Bella Vista Integrated Health. It also aimed to increase their confidence in performing medication reconciliation during admission and follow-up appointments. The MATCH (Medication at Transition and Clinical Handoffs) toolkit is an evidence-based toolkit developed with the Agency for Healthcare Research and Quality (AHRQ) support to enhance the workflow process of medication reconciliation in an organization.

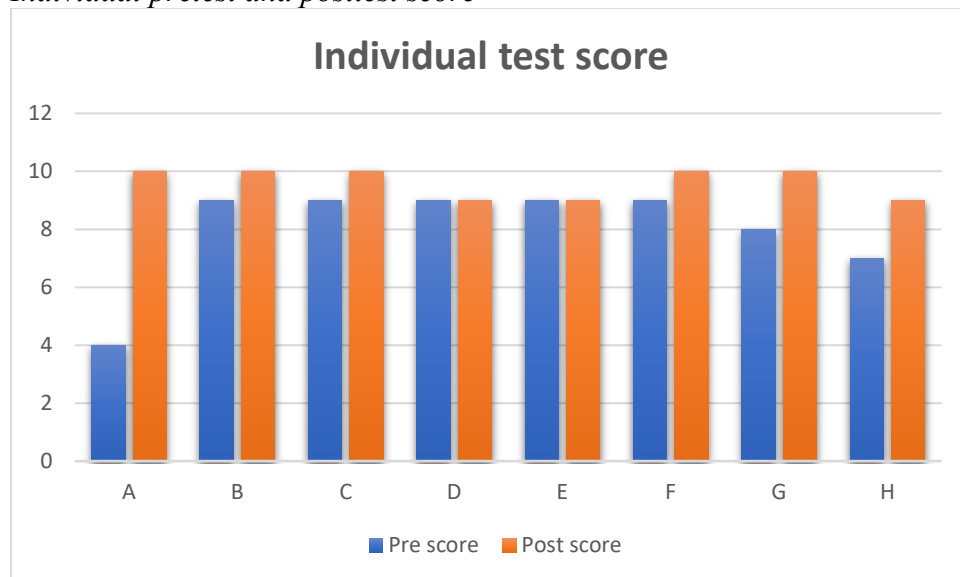
**METHODS:** This DNP project consisted of an educational program which included a PowerPoint presentation to teach providers and MAs about the importance of an accurate medication reconciliation. The educational material included a pretest and a posttest (10 multiple choice questions in the pretest and posttest, Likert scale type open-ended question in pretest and three open-ended questions) to evaluate the participants' knowledge about medication reconciliation. The pretest questionnaire tested the participants' baseline knowledge, and the posttest reevaluated their knowledge after they viewed the educational presentation and assessed their confidence level. A total sample N=12 responded to the invitation and 8 participants completed the pretest and posttest.

**RESULTS:** This project was successful in improving providers' and MAs' knowledge about the importance of MR. Most participants' scores indicate an improvement in both knowledge and confidence in MR. The pretest average score was 8/10 with a median of 9/10. The posttest average was 9.63/10 with a median of 10/10. Five participants' posttest scores improved after they viewed the PowerPoint presentation whereas two participants' scores remained the same in

the pre and posttest (see figure 1). On a scale of 0 – 5, with 5 being as confident as possible, 5 participants reported 5 for their confidence level with MR (see figure 2).

**Figure 1**

*Individual pretest and posttest score*



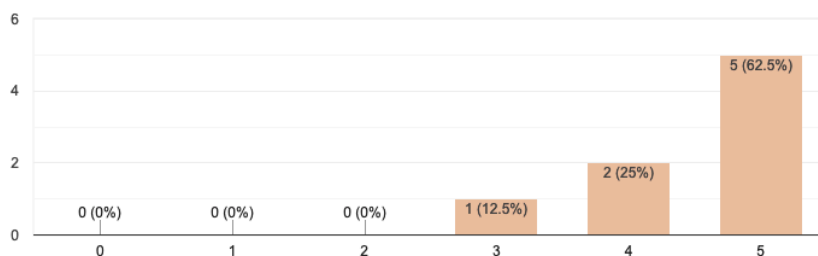
**Figure 2**

*Participants' confidence levels*

11) Confidence level: On a scale of 0 – 5 with 0 being not confident at all and 5 being as confident as possible, rate your confidence in the Medication Reconciliation Process.



8 responses



When asked about potential barriers for utilizing the MATCH toolkit at the clinic, four participants identified time as a barrier. One participant identified “*EHR integration*” as a barrier; one participant stated, “*Time and assigning responsibility for implementing the toolkit when employees may already be stretched too thin*” could be a barrier to implementing this toolkit. Another participant reports that “*changing office culture to accommodate new procedures*” could be a barrier to implementing the MATCH toolkit.

**CONCLUSION:** This project was successful in improving providers and MA's knowledge about the importance of medication reconciliation. This type of educational program can be an effective tool for teaching staff about the importance of medication reconciliation and the MATCH toolkit in an outpatient clinic and increasing confidence in performing MR.

**CLINICAL RELEVANCE:** This educational PowerPoint can be used as an educational aid in other Bayless clinics to improve knowledge about effective medication reconciliation. Additionally, this project could be beneficial for this practice in assessing barriers to the reconciliation of patients' medications during admission, and during follow-up. The educational material could be modified to discuss potential barriers at the specific clinic.

**Note:** This project was reviewed and has been approved by the University of Arizona's faculty before presenting to Bella Vista Bayless Integrated Healthcare.

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