IMPLEMENTING METABOLIC MONITORING IN SECOND-GENERATION. ANTIPSYCHOTIC USE: A QUALITY IMPROVEMENT PROJECT

by

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A scholarly project submitted in partial fulfillment
of the requirements for the degree

of

Doctor of Nursing Practice

in

Psychiatric Mental Health

MONTANA STATE UNIVERSITY
Bozeman, Montana

May 2024

ACKNOWLEDGEMENTS

I want to express my appreciation to Dr. Lindsey Davis, whose guidance, encouragement, and unwavering support have been instrumental throughout my doctoral nursing journey. Your patience and dedication have inspired me to continue pushing boundaries and striving for excellence.

I am immensely thankful to my committee member, Dr. Alice Running, for her feedback, insightful discussions, and constructive feedback, which significantly enriched my nursing experience and the quality improvement project.

I am deeply grateful to my peers for their ongoing camaraderie, collaboration, and intellectual stimulation, impacting my journey to become a doctoral-prepared advanced practice registered nurse.

I am forever indebted to my family for their unconditional love, encouragement, and sacrifices to help me achieve my nursing dreams. Their steadfast belief in me has been a constant companion and source of motivation throughout this life-changing journey.

Please accept my deepest gratitude.

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ABSTRACT

Background: Roughly one in five adults in the United States live with a psychiatric disorder, including major depressive disorder, bipolar disorder, and schizophrenia. Despite their effectiveness in treating psychiatric disorders, second-generation antipsychotics (SGAs) are associated with an increased rate of metabolic side effects (MSEs). To reduce the impact of MSEs and the potential development of metabolic syndrome, individuals on SGA need routine metabolic screening.

Local problem: At an outpatient mental health clinic, 21% of the patients were prescribed SGAs; however, the clinic lacked a standardized protocol to assess MSEs. This project aimed to increase the completion rate of metabolic monitoring and improve patient health outcomes in patients diagnosed with a psychiatric disorder.

Methods: A multifaceted approach was created for providers to increase adherence to metabolic screening in SGA use.

Interventions: Three interventions were initiated: an electronic health record macro was created to promote consistent provider documentation, a standardized metabolic monitoring process, and educational in-services performed to encourage screening adherence.

Results: The project aims were achieved with the clinic maintaining an 80% blood pressure (BP) completion rate. Documentation of body mass index (BMI) increased by 72%. Appropriate lab monitoring improved from an 8.5% rate during the preintervention phase to a rate of 33% postintervention. There were no changes in provider perceptions and practices regarding metabolic monitoring in SGA use.

Conclusion: The project effectively increased the rate of metabolic monitoring in individuals prescribed an SGA.

Keywords: antipsychotics, metabolic monitoring, metabolic screening, psychiatric disorders

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CHAPTER ONE

REVIEW OF THE LITERATURE

Introduction

An estimated one in five adults in the United States lives with a mental health disorder, and 5% of this population live with a severe mental illness (SMI) (National Alliance on Mental Illness [NAMI], 2023). Severe mental illness describes a mental, behavioral, or emotional psychiatric disorder that causes severe functional impairment that significantly interferes with an individual's quality of life and major life activities. Antipsychotics play a central role in the acute and long-term treatment plan for many patients with psychiatric disorders. The primary goal in promoting metabolic monitoring in patients on antipsychotics is to recognize associated risk factors for metabolic complications (e.g., obesity, metabolic syndrome) and target treatable comorbid conditions (e.g., diabetes, dyslipidemia, and hypertension), thereby improving patient outcomes.

Background

Evidence suggests that clients diagnosed with psychiatric disorders experience a high medical and disease mortality burden (Saldanha et al., 2021). Individuals experiencing an SMI die approximately 15 to 25 years earlier and have a 2-3 times higher risk of developing metabolic side effects (MSEs) than the general population (Abdulhaq et al., 2021; Kornetova et al., 2020). The increased mortality rate in this population subset is associated with metabolic and cardiovascular abnormalities. In particular, individuals with an SMI are more likely to exhibit associated risk factors for cardiovascular disease (CVD), such as obesity, dyslipidemia,

hypertension, and diabetes. Due to the central role of antipsychotics in treating psychiatric disorders, healthcare providers need to pay close attention to the adverse effects and long-term impact of these medications on patients' health and well-being.

Antipsychotic medications have been available since the mid-1950s; these agents are called typical or first-generation antipsychotics (FGA) (e.g., haloperidol). In the early 1990s, researchers developed new antipsychotic drugs called second-generation antipsychotics (SGA) or atypical antipsychotics (e.g., risperidone, clozapine, olanzapine, etc.). Traditionally used to treat psychotic disorders, antipsychotics are now used to treat many psychiatric disorders and symptoms.

Although FGA and SGA are similar in clinical efficiency in the management and treatment of positive and negative symptoms commonly seen within psychiatric disorders, SGAs are preferred due to better tolerability, low incidence of extrapyramidal side effects, cognitive impairment, tardive dyskinesia, and improved patient adherence (Abdulhaq et al., 2021; Mohammed & Naeem, 2022). Despite their effectiveness, SGAs are associated with an increased rate of metabolic side effects (MSEs), including alterations in weight, blood pressure (BP), and lipid levels (Buhagiar & Jabbar, 2019; Sepúlveda-Lizcano et al., 2023; Sun & Jang, 2020). The collection of these MSEs places the patient at risk of developing metabolic syndrome.

Metabolic syndrome (MetS) is a cluster of risk factors, including abdominal obesity, dyslipidemia, hypertension, and insulin resistance (Kwobah et al., 2020; Sun & Jang, 2020). A key risk factor contributing to the development of cardiometabolic complications is being overweight. Research reveals that patients diagnosed with MetS have an increased probability of CVD, atrial fibrillation, heart failure, stroke, and diabetes mellitus due to poor lifestyle choices

commonly seen in patients with SMI characterized by substance use, lack of physical activity, poor dietary choices, and MSE from medication regimen (Mohammed & Naeem, 2022; Fontaine et al., 2022; Poojari et al., 2023). Available data suggests that MetS occurrence in antipsychotic use is 53% compared to the general population rate of 23% (Fontaine et al., 2022; Poojari et al., 2023). Current evidence-based clinical practice guidelines from medical organizations, including the American Diabetes Association (ADA) and American Psychiatric Association (APA), recommend 100 percent adherence in metabolic monitoring in antipsychotic use to assess for MSEs and the prevalence of MetS; however, present data suggests that the yearly monitoring rates for glucose and lipids were 71% and 40% respectfully (Bomboy et al., 2021).

Collaborating with other medical institutes, the APA and ADA released a consensus statement for healthcare providers regarding routine metabolic monitoring in prescribed antipsychotic use. When initiating antipsychotic medication, the guidelines recommend a baseline weight, body mass index (BMI), blood pressure (BP), fasting blood glucose, fasting lipid panel, and waist circumference (WC); healthcare providers should reassess weight (BMI) every 4 weeks until week 12, then every 3 months after that. It is recommended that the patient's BP, fasting blood glucose/hemoglobin A1c, fasting lipid panel, and WC be reexamined at week 12 and then annually after that. Interestingly, a Cochrane Review did not support routine metabolic monitoring in patients prescribed antipsychotics. However, it is recommended by the National Institute for Health and Care Excellence (NICE) and the ADA/APA consensus statement.

The primary role of routine metabolic monitoring is to assess for the onset or worsening of metabolic changes in antipsychotic use. Early recognition of these undesirable side effects can

improve the patient's quality of life, medication adherence, and patient outcomes while reducing associated comorbidity and mortality risks. Despite being developed and implemented over two decades ago, current data exposes suboptimal adherence to these guidelines by healthcare providers. This scoping review aims to synthesize available research regarding the rate of metabolic monitoring, the prevalence of MSEs, and healthcare provider awareness and attitude toward current clinical practice guidelines.

Methods

Search Strategies

This scoping review was prepared using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). A literature synthesis review of the databases CatSearch, Web of Science, ProQuest Central, CINAHL, and PsychInfo was conducted using the following search terms: "antipsychotic," "metabolic monitoring," "metabolic syndrome, "severe mental illness," "intervention," "physical health," "monitoring," "mental disorders," "quality improvement," "randomized control trials," and "NOT children or adolescents or youth or child or teenager."

Eligibility – Inclusion and Exclusion Criteria. Studies were included if they were (1) published between 2018-2023, (2) written in the English language, (3) focused on patients over the age of 18, (4) peer-reviewed, (5) nurse practitioner/psychiatrist-focused quality improvement projects focusing on metabolic monitoring, and (6) full text. Conversely, studies were excluded if they were (1) theses or dissertations, (2) abstracts only, (3) a study population receiving adjunctive therapy that might influence body weight during the study, (4) a study population

using antipsychotic medication to treat nausea or vomiting, and (5) studies assessing brain changes after antipsychotic intake, such as delirium.

Results

The initial search revealed 700 articles. After a thorough evaluation, 26 articles met all the inclusion criteria (see Appendix H). Approximately 77% (20/26) of these investigated the prevalence of MSEs and metabolic monitoring, whereas 23% (6/26) assessed patient or provider education, knowledge, and attitudes regarding metabolic monitoring in antipsychotic use. Most of the articles consisted of retrospective cross-sectional studies (n=14). Four quality improvement projects were included in this review, along with two cohort studies, one Delphi survey, two meta-analyses, one meta-synthesis, one pilot study, and a systematic review.

The primary psychiatric diagnoses investigated within the collection of articles were schizophrenia, schizoaffective disorder, bipolar disorder, and affective disorders (e.g., major depressive disorder, generalized anxiety disorder). The mean age of study participants was 39.8. Most of the studies did not address the hierarchy of the psychiatric illness of interest nor account for comorbid diagnoses amongst study participants. Substance use disorder was not part of the exclusion criteria in three studies (de Caluwé et al., 2019; Mohammed & Naeem, 2022; Saldanha et al., 2021). Male participants were more likely to have a schizophrenia diagnosis, whereas females were more likely to have bipolar or affective disorders.

Patients with SMI were likely to be prescribed a single SGA agent versus an FGA or a combination of an FGA and SGA. The most frequently investigated SGA and its associated risk factors for metabolic complications was risperidone, followed by olanzapine, clozapine, aripiprazole, and quetiapine.

Current data suggests that one in 10 patients with an SMI will experience metabolic complications (e.g., diabetes, dyslipidemia, or MetS) and have a 3.6 times greater risk of developing CVD within their lifespan (Bomboy et al., 2021). Over half of the studies examined the prevalence of MetS and associated risk factors in patients with SMI (see Table 1). It was noted that there were not only dissimilarities within the studies regarding how to obtain cardiometabolic measurements (e.g., BP, WC, or laboratory work) but also how to define MetS, further suggesting the true prevalence of this condition remains largely unknown (see Table 2).

Despite being disseminated over a decade ago, suboptimal compliance rates to the ADA/APA metabolic monitoring recommendation in patients prescribed antipsychotic medication continue in the clinical setting. For example, one recent study indicated that 55% of patients receiving antipsychotic agents received the recommended screenings within 12 months (Mangurian et al., 2018). In contrast, another study found that only 37% of patients prescribed antipsychotic medication received monitoring for at least three cardiometabolic parameters (Fontaine et al., 2021). In a recent study by Bomboy et al. (2021), researchers reported an annual glucose monitoring rate of 71% and lipids at 40% in patients prescribed antipsychotics. Conversely, another study revealed plasma glucose monitoring at 41.5% and lipids at 55% in the same patient population (Fontaine et al., 2021). When examining the adherence rate to BP monitoring, current data shows a rate of 69% (Fontaine et al., 2022). One study revealed that young adults with SMI who are prescribed antipsychotic agents are less likely to be screened compared to other age groups despite their relative risk factors for developing MSEs (Mangurian et al., 2018). Inconsistencies in the frequency of metabolic monitoring decrease the chance of early detection of metabolic changes, including MetS.

Several studies revealed a statistically significant association between the patient's age, duration of psychiatric illness, and development of MetS (Agaba et al., 2019; Lappin et al., 2018; Saldanha et al., 2021; Poojari et al., 2020). When accounting for external variables such as physical inactivity, poor weight management, poor dietary habits, and substance use, multiple studies revealed a statistically significant correlation between the prevalence of MetS in patients with SMI. Compared to their male counterparts, females with a history of SMI are 35% more likely to be diagnosed with MetS during their lifetime (Tsima et al., 2022; de Caluwé et al., 2019; Agaba et al., 2019; Reis da Silva et al., 2022). Of the SGA agents, clozapine, olanzapine, and quetiapine were revealed to have the highest impact on weight or BMI (Sepúlveda-Lizcano et al., 2023; Rognoni et al., 2021). Quetiapine, clozapine, and risperidone were noted to cause lipid alterations, another known risk factor for MetS (Buhagiar & Jabbar, 2019; Sepúlveda-Lizcano et al., 2023). No statistically significant correlation was found regarding the dose, duration of the SGA, and prevalence of MetS.

Table 1: Summary of Outcome Measure Include in the Scoping Review

Study	**Outcome**						
	BMI	BP	FG	HbA1c	LP	WC	Wt.
Agaba et al., 2019		√	√		√		√
Bomboy et al., 2021				√	√		
Buhagiar & Jabbar, 2019					√		
de Caluwé et al., 2019		√				√	√
Fontaine et al., 2022	√	√	√	√	√		√
Hammoudeh et al., 2019	√	√		√	√		
Kornetova et al., 2020	√				√	√	
Kwobah et al., 2021	√				√		
Mangurian et al., 2018			√	√			
Mohammed & Naeem, 2022	√	√		√	√		
Poojari et al., 2020		√	√		√	√	√
Reis da Silva et al., 2022	√					√	√
Schneiderhan et al., 2023				√	√		
Sepúlveda-Lizcano et al., 2023	√				√		
Soda et al., 2021				√	√		
Sun & Jang, 2020	√	√	√		√	√	
Tsima et al., 2022		√				√	√
Vochoskova et al., 2023	√				√		

BMI-body mass index; BP-blood pressure; FG-fasting glucose; HbA1c-hemoglobin A1c; LP-lipid panel; WC- waist circumference; Wt.-weight

When assessing for monitoring barriers and limitations, studies by Poojari et al. (2023) and Abdulhaq et al. (2020) indicated that inaccessibility to primary health services, lack of education and awareness (e.g., patient, caregiver, provider), and motivation play a significant role in metabolic monitoring adherence. Additional obstacles noted by patients include financial hardships and patient-related concerns (e.g., medication impact on quality of life) (Poojari et al., 2023). Practitioners noted time and resource constraints, patient capacity, insufficient system-level support (e.g., training, interoperability, workflow, etc.), and poor care coordination as barriers to routine monitoring (Poojari et al., 2023; Porter & Aggar, 2021; Schneiderhan et al.,

2023). Research reveals that following the implementation of electronic health record (EHR) clinical decision-making alerts and provider education regarding the importance of metabolic monitoring, rates increased from 49% to 80% (Soda et al., 2021; Porter & Aggar, 2021).

Table 2. Defining Metabolic Syndrome.

IDF	**NCEP**	**AHA/NHLBI**
Criteria: Increased WC along with any 2 of the following	Criteria: Any three or more of the following five factors	Criteria: Any three or more of the following five factors
WC ≥ 90 cm in males or ≥ 90 cm in females	WC ≥ 102 cm in males or ≥ 88 cm in females	WC ≥ 101 cm in males or ≥ 88 cm in females
HDL < 40 mg/dL in males and < 50 mg/dL in females	HDL < 40 mg/dL in males and < 50 mg/dL in females	HDL < 40 mg/dL in males and < 50 mg/dL in females
Elevated blood pressure ≥ 130/85 mmHg	Elevated blood pressure ≥ 130/85 mmHg	Elevated blood pressure ≥ 130/85 mmHg
Elevated fasting plasma ≥ glucose 100 mg/dL	Elevated fasting plasma ≥ glucose 100 mg/dL	Elevated fasting plasma ≥ glucose 100 mg/dL

IDF-International Diabetes Federation; NCEP-National Cholesterol Education Program; AHA-American Heart Association and National Heart Lung and Blood Institute, WC-waist circumference, HDL-high density lipoprotein.

In a recent survey, 74% of psychiatrists were aware of the metabolic screening guidelines; however, only 27% of those surveyed followed the recommendations (Abdulhaq et al., 2020). When asked about screening for CVD risk factors, 88% of psychiatrists agreed that patient education was important, but 60% reported that the primary care provider should monitor for adverse side effects (Galderisi et al., 2020). While providers generally agree that patients receiving antipsychotic medication are at a greater risk of metabolic and cardiovascular problems, current data suggests the need for ongoing provider education regarding the positive impact monitoring has in disease prevention.

Discussion and Conclusion

This scoping review confirms the need for routine metabolic monitoring to assess for the acute and long-term side effects in patients prescribed antipsychotic medications. Available data demonstrates suboptimal adherence rates to the ADA/APA recommended monitoring guidelines. While antipsychotics continue to demonstrate clinical efficiency in treating and managing psychiatric disorders, these agents place individuals at a higher risk for comorbidity and mortality than the general population. Partly driven by antipsychotic agents, individuals are more likely to experience metabolic and cardiovascular sequela. Due to the high disease burden risk, healthcare providers must stay vigilant in their monitoring practices.

Furthermore, this review highlights ongoing discrepancies regarding the definitions of MetS within the medical community. The available literature emphasizes the need for continuous patient and provider education regarding the risks vs. benefits of antipsychotic use. Educational interventions should be implemented to reduce variation in metabolic monitoring and anthropometric measurements amongst healthcare providers. Numerous articles recommend routine cardiometabolic monitoring, yet only some address monitoring implementation in healthcare.

The limitations of this literature review include not assessing antipsychotics as an adjunctive treatment option. Articles selected for examination focused on antipsychotics as primary treatment options for psychiatric disorders. Another limitation includes not investigating the prevalence of MSEs in patients who use SGA to manage neurodevelopment or neurocognitive disorders. Implementing routine metabolic monitoring will enhance the identification and awareness of potential MSEs and increase patient care coordination with the

interdisciplinary team, which will improve the patient's quality of life, medication adherence, and health outcomes

CHAPTER TWO

QUALITY IMPROVEMENT PROPOSAL

Introduction

An estimated one in five adults in the United States lives with a mental health disorder, and 5% of this population live with a severe mental illness (SMI) (NAMI, 2023). Present data reveals that 45.2% of Idahoans experiencing a mental health illness are unable to receive the necessary psychiatric care, impacting the patient's psychological and medical status (NAMI, 2021). Unfortunately, Idahoans are more than 1.5 times more likely to be forced out of their insurance network to receive adequate mental health care, further impacting patient health outcomes (NAMI, 2021). Numerous studies indicate those with a psychiatric disorder are 2-3 times more likely to develop cardiometabolic complications, including MetS (Abdulhaq et al., 2021; Kornetova et al., 2020). State-level and site data regarding the prevalence of MSEs or MetS is unavailable. To help improve the patient's quality of life and health outcomes, healthcare clinicians frequently use antipsychotics. Despite their clinical efficiency in treating positive and negative symptoms, SGA use is associated with an increased risk for MSEs, including alterations in BMI, WC, BP, glucose, and lipid levels.

In collaboration with other medical institutes, the APA and ADA released a consensus statement recommending baseline routine metabolic monitoring (e.g., vital signs, glucose, and lipid levels) in antipsychotic use. Recent data reveals modest glucose and lipid monitoring rates (Bomboy et al., 2021; Soda et al., 2021). Psychiatric mental health nurse practitioners (PMHNPs) are well-positioned to advocate for clinical improvement in metabolic monitoring;

however, clinicians frequently cite insufficient system-level support, time, lack of awareness or knowledge, and poor care coordination as reasons for incomplete monitoring in patients prescribed antipsychotics (Poojari et al., 2023; Abdulhaq et al., 2020). Predictably, inconsistencies in provider metabolic monitoring decrease rates of early detection of MSEs, further impacting the patient's health outcomes.

Problem Statement

Individuals with psychiatric disorders are at an increased risk for poor health outcomes, including cardiometabolic complications. Suboptimal trends remain within mental health despite the emphasis on routine laboratory monitoring within the literature findings. The chosen site for this quality improvement (QI) project does not routinely evaluate MSEs in antipsychotic use due to the lack of a standardized protocol. Efforts to improve routine monitoring may include an increase in care collaboration between mental health and primary care providers, raising awareness about the importance of integrated care, enhancing training and education for providers, and reducing the ongoing stigma surrounding individuals with psychiatric disorders. By implementing these strategies, healthcare systems can work together to improve the psychological and physiological status of individuals with a psychiatric illness while reducing the risk for cardiometabolic sequela.

Organizational Microsystem Assessment

The site for this QI initiative is an urban, privately owned outpatient psychiatric office in Southwestern Idaho. The clinic comprises seven PMHNPs, one office manager, one receptionist, and one medical assistant (MA). The clinic provides psychiatric care across the lifespan and

focuses on delivering high-quality, patient-centered care. Despite the clinic's aim to provide comprehensive care, routine metabolic monitoring in antipsychotic use remains suboptimal. This is partly due to the absence of a standardized protocol for MSEs. Interviews with multiple providers at the clinic reveal inconsistency and uncertainty regarding the need for routine MSE screening. One provider discussed how they perform MSE screening based on clinical experience and personal decision-making (personal communication, 2023).

An informal retrospective chart review at the clinic reveals that BP documentation rates were reported in 80% of patients receiving antipsychotics over 12 months compared to 69% in the literature findings. In contrast to the 47% adherence rate reported in the existing literature, weight was documented 77.8% of the time at the clinic. Laboratory monitoring (e.g., blood glucose and lipids) was 8.2% compared to the literature review findings of 45.5%. The body mass index was reported at 27.8%. Site-specific data regarding WC was unavailable. When discussing these discrepancies with the practice owner, they acknowledge the importance of developing a standardized protocol for metabolic monitoring in antipsychotic use to improve patient outcomes.

Quality Improvement Framework

The Plan-Do-Study-Act (PDSA) cycle will be utilized for this QI project because of its simplicity and effectiveness (Institute of Health Improvement (IHI), 2017). This QI framework is flexible by promoting small to moderate process improvement interventions. Most importantly, the PDSA model allows for real-time feedback from key stakeholders by continuously assessing process improvement initiatives. Since the clinical site is small, utilizing a simple and cost-effective model is important to improve patient outcomes and provider buy-in.

Plan-Do-Study-Act Process:

Plan: The DNP student approached the clinic site with the idea of performing a needs assessment regarding routine metabolic monitoring in antipsychotic use after witnessing clinical practice discrepancies among the PMHNPs during practicum rotations. Further investigation revealed that the clinic lacked any standardized policy or procedure for metabolic monitoring in patients receiving antipsychotics. Metabolic monitoring in antipsychotic use was determined as a feasible, evidence-based intervention to promote early recognition of MSEs and improve health outcomes following a literature review. The project team (e.g., site representative and practice owner) reviewed current research and clinical data. The ADA/APA consensus statement assisted the project team in developing this QI initiative for metabolic monitoring due to its simple algorithm for cardiometabolic measurements (see Appendix B & C). A Likert-scale survey was adapted from Mangurian et al. (2019) to assess barriers and perceptions of the providers throughout the process-improvement project (see Appendix E).

Do: The standardized policy and procedure will be implemented during initial evaluation appointments throughout this 8-week QI project. Specific to qualitative data, the DNP student will ask clinic staff the following weekly questions: (1) What is working well within the current workflow? (2) What process(es) need improvement? Quantitative data will be assessed by the frequency of vital signs and laboratory ordering/results (see Appendix D). Patient and provider data will be collected, tallied, and de-identified into a password-protected Excel spreadsheet at the clinical site for future comparison.

Study: The DNPs will assess qualitative and quantitative data every Wednesday. The collected data will be presented via a bulletin in the clinic's breakroom every Thursday. The

DNPs and the site representative will meet every two weeks to review current data. The data will continue to be tallied and tracked for future comparison and intervention decisions.

Act: At this phase, the intervention initiatives will be adjusted, adapted, or abandoned based on the data and feedback collected during the PDSA cycle.

Purpose Statement/Specific Aims

The purpose of this QI project initiative, entitled Implementing Metabolic Monitoring in Second-Generation Antipsychotic Use, is to examine the effectiveness of integrating cardiometabolic side effect education and a standardized clinical protocol for metabolic monitoring in SGA use in individuals over the age of 18 and diagnosed with a psychiatric disorder to improve health outcomes. The QI project will measure the presence of vital signs (e.g., BP and BMI) and laboratory ordering/results (e.g., glucose and lipid panel) through retrospective weekly chart audits (see Appendix D). Providers will complete a Likert-scale survey pre-and-post implementation to assess changes in clinical practice, barriers, and perceptions (see Appendix E).

The short-term goals for this QI project include 100% of the PMHNPs receiving education regarding the new protocol for laboratory monitoring and the potential for MSEs in SGA use. Mid-term goals include 100% of the PMHNPs reporting confidence in the new workflow, maintaining an 80% adherence rate for BP, and achieving an 80% adherence rate for BMI and lab work (e.g., glucose and lipid profile). This QI project's long-term goal is to achieve a 100% adherence rate to the standardized protocol for metabolic monitoring in SGA use by the end of the 8 weeks.

Methods

Implementation Summary

The site for this QI project is an urban, privately owned outpatient psychiatric office in Southwestern Idaho. The clinic comprises seven PMHNPs, one office manager, one receptionist, and one medical assistant (MA). The practice owner expressed interest in implementing a standardized procedure for metabolic monitoring in antipsychotics to provide current evidence-based care and improve patient psychological outcomes. After multiple stakeholder meetings, the ADA/APA consensus statement was selected to guide the process-improvement initiative due to its simple algorithm for cardiometabolic measurements. This QI project will measure the frequency of vital signs (e.g., BP and BMI) and laboratory ordering/results documentation in all new patients prescribed an SGA (see Appendix D). Using an adapted Likert-scale survey, the QI project will assess provider frequency, perceptions, and barriers to routine monitoring pre-and-post implementation (see Appendix E). De-identified patient and provider data will be collected and tallied into a password-protected Excel spreadsheet throughout this 8-week QI project. Data analyses will be completed weekly, and the results will be shown via run charts, line charts, bar graphs, and pie charts.

Interventions and Implementation. The primary objective of this QI project is to implement a standardized protocol for metabolic monitoring in SGA use in patients over the age of 18 diagnosed with a psychiatric disorder to improve health outcomes. Individuals diagnosed with a psychiatric disorder are 2 to 3 times more likely to develop cardiometabolic sequela, such as MetS (Abdulhaq et al., 2021; Kornetova et al., 2020). However, available research indicates that despite knowing the health risks associated with SGA use, suboptimal trends remain

(Abdulhaq et al., 2020). Multiple studies report a lack of education and awareness (e.g., patient, caregiver, provider) and insufficient system-level support (e.g., continuous education, interoperability, workflow) as consistent barriers to implementing routine monitoring into clinical practice (Poojari et al., 2023; Porter & Aggar, 2021; Schneiderhan et al., 2023). Several QI projects reveal that implementing a standardized protocol, an electronic health record (EHR) clinical decision-marking alert, and providing education increases adherence rates (Soda et al., 2021; Porter & Aggar, 2021).

Preliminary steps of this QI project include creating a fishbone diagram with stakeholders to identify barriers, designing a process workflow (e.g., swim lane) to distinguish clinical staff duties and responsibilities, and developing a standardized protocol for metabolic monitoring. Additional steps include making a brief, educational PowerPoint presentation about common MSEs and the new workflow for the site (see Appendix F). The site representative will establish staff education during the monthly staff meeting and notify staff of any process changes. Due to limited staff, the doctoral student will be responsible for developing a standardized protocol for metabolic monitoring, the PowerPoint presentation, and de-identifying patient and provider data via Excel. The practice owner will be responsible for approving the standardized protocol for metabolic monitoring. After receiving the Montana State University Committee and Instituional Review Board (IRB) approval, these steps will be completed by December 31st, 2023.

Following completion of the preliminary QI project steps and the IRB approval, the DNP student will present the educational PowerPoint to clinical staff during the monthly staff meeting on January 11th, 2024. The DNP student will remain available to address any questions throughout the staff meeting. If a staff member cannot attend the initial educational session, the

DNP student will provide an individualized session. This process improvement will occur over 8 weeks starting January 15th, 2024. There will be two PDSA cycles, with each cycle lasting four weeks.

Every Wednesday, the DNP student will assess qualitative and quantitative data. Specific to qualitative data, the doctoral student will ask clinical staff the following questions biweekly: (1) What is working well within the current workflow? (2) What process(es) need improvement? Feedback will assist in the next PDSA cycle. Quantitative data will be measured through a Likert-scale survey, and the number of BMI, BP, and laboratory orders/results documented in patient charts (see Appendix D). There are two phases for survey collection. The Likert-scale pre-implementation survey will be administered to the clinical staff 1 week before the QI intervention. Then, the post-implementation survey will be administered 1 week before the project's conclusion. Current quantitative data will be presented to the clinical staff every Thursday as line charts, run charts, bar graphs, and pie charts. De-identified patient and provider data will be collected and tallied into a password-protected Excel spreadsheet throughout this 8-week QI project. The DNP student and the site representative will meet every 2 weeks to review current data. Following each PDSA cycle, the DNP student will coordinate with the site representative to adjust, adapt, or abandon initiatives based on the data collected during the PDSA cycle. The site representative will be responsible for sending an email to clinical staff regarding any process changes made at the end of each PDSA cycle.

A key foreseeable barrier to successfully implementing metabolic monitoring includes limitations with the clinic’s current EHR system. No user-friendly reporting option is currently available to assess cardiometabolic monitoring within the EHR. Each provider must manually

search for relevant data. Another potential barrier to this QI initiative is time restrictions. For example, the clinicians may not have enough time during the appointment to adequately address the patient's mental and physical health concerns. Additional limitations may include the PMHNP's reluctance to follow the standardized workflow due to personal biases regarding the importance of routine metabolic monitoring.

Furthermore, clinical staff may attribute the lack of routine monitoring to the patient's ambivalence or nonadherence in following current treatment recommendations. It is also important to assess whether patients will experience barriers to obtaining laboratory work due to financial constraints, transportation issues, and lack of insurance coverage. Other barriers may include focusing more on the psychiatric symptoms and not prioritizing physical concerns. The PMHNPs and patients may be hesitant to adjust psychiatric medications regardless of cardiometabolic abnormalities. Also, the patient and the PMHNPs may encounter ongoing fragmented care due to a lack of coordination and communication between mental health and primary care providers, resulting in unnecessary or missed opportunities to obtain metabolic monitoring and interventions. Nonetheless, ongoing education regarding the importance of routine monitoring in antipsychotic use will help increase patient health outcomes and well-being.

Evaluation and Analysis. This QI project intervention will be evaluated through retrospective weekly chart audits with quantitative and qualitative data throughout the 8-week implementation period. Specific to qualitative data, the doctoral student will ask clinical staff the following questions: (1) What is working well within the current workflow? (2) What process(es) need improvement? Quantitative data will be measured through a Likert-scale survey

(see Appendix E). In addition, the frequency of vital signs (e.g., BMI, BP) and laboratory request documentation will be evaluated (see Appendix D). Data analyses will be completed weekly, and the de-identified results will be shown via run charts, line graphs, bar graphs, and pie charts. During analysis, the DNP student will determine the effectiveness of the proposed interventions. The site representative will be responsible for establishing staff education time during the monthly staff meeting. Due to limited staff, the doctoral student will be responsible for developing a standardized protocol for metabolic monitoring and the PowerPoint presentation. In addition, the DNP student will be responsible for de-identifying patient and provider data. De-identification will be completed using Excel. The practice owner will be responsible for approving the proposed standardized protocol for metabolic monitoring. This QI project will utilize descriptive statistics to evaluate the frequency and average number of patients who received cardiometabolic monitoring, ordered/completed laboratory studies, and provider perceptions.

Safety and Confidentiality. This QI project initiative poses no increased risk to patients in this population subset outside the risks involved in their current treatment plan. Clinical staff and the DNP student will provide the standardized metabolic monitoring protocol. Data collected will be de-identified and stored in a password-protected Excel spreadsheet at the clinical site. Only the site representative and DNP student will have access to the protected health information to ensure patient confidentiality throughout the project. No protected health information or patient records will be removed from the project site. Data will be de-identified and summarized before sharing with the faculty at Montana State University. This DNP project requires the

approval of the Montana State University IRB before implementation. At the request of the chosen site, this quality improvement is scheduled for January 15th, 2024.

Table 3. SMART Goals

<table>
<tr><td colspan="3">SMART Goal #1: 100% of the clinical staff will complete metabolic monitoring education and pre-QI project implementation survey by January 10th, 2024.
The psychiatric clinic consists of 5 PMHNPs, one receptionist, one medical assistant, and the office manager.
If a member of the clinical staff is unable to attend the individual education session, an individualized session will be provided by the DNP student</td></tr>
<tr><td colspan="3">Description of strategies to be utilized to accomplish the goal including any needed resources.
A PowerPoint presentation will be used to deliver staff education and training.
Surveys distributed to clinical staff prior to educational presentation to assess baseline knowledge and perceptions of metabolic monitoring</td></tr>
<tr><td>Data to be collected</td><td>Method of collection and who is responsible</td><td>Planned data analysis</td></tr>
<tr><td>Survey responses from clinical staff</td><td>DNP student will collect and de-identify surveys.
DNP will input data into a password protect spreadsheet</td><td>Initial survey data will be used to evaluate staff baseline perceptions and knowledge of metabolic monitoring and MSEs.
A graph will be used as a visual aide to compare pre/post survey data.</td></tr>
<tr><td colspan="3">SMART Goal #2: Maintain an 80% adherence rate for BP and achieving an 80% adherence rate for BMI and lab work (e.g., glucose and lipid profile). Metabolic monitoring will be documented per standardized protocol in all new patients who are prescribed an SGA starting January 15th, 2024, through March 8th, 2024
80% of patients prescribed antipsychotic medication is a reasonable goal for this site due to the average number of new patient appointments at the clinic who may be receiving SGA and duration of QI project</td></tr>
<tr><td colspan="3">Description of strategies to be utilized to accomplish the goals including any needed resources.
Clinical staff participation and teamwork to ensure metabolic monitoring is captured accurately.
DNP student access to site EHR</td></tr>
</table>

Table 3. SMART Goals continued

Data to be collected	Method of collection and who is responsible	Planned data analysis
Metabolic monitoring (e.g., the presence of laboratory orders, documented lab results, and vital signs).	Manual chart audit by DNP student	Completeness of RN documentation Cardiometabolic values charted in EHR for all patients prescribed antipsychotics
SMART Goal #3: Retrospective chart audits will be completed to extract metabolic monitoring during January – March 31, 2024		
Description of strategies to be utilized to accomplish goal including any needed resources. • DNP access to clinic site EHR for data extraction		
Data to be collected:	Method of collection and who is responsible	Planned data analysis
Clinical staff documentation specific to metabolic monitoring	Manual chart data extraction by DNP student	Documented metabolic monitoring results in antipsychotic use
SMART Goal #4: 100% of the clinical staff will complete post-implementation survey by April 15, 2024 • DNP student will distribute post implementation survey 2 weeks before end date. • DNP student will expect the same number of staff responses pending on any clinical staffing changes.		
Description of strategies to be utilized to accomplish goal including any needed resources. • Folder will be provided with the final survey to ensure anonymity of responses and turned into the DNP student upon completion		
Data to be collected	Method of collection and who is responsible	Planned data analysis
Survey responses from clinical staff	DNP student will collect and de-identify surveys. DNP will input data into a password protect spreadsheet	Final survey data will be used to evaluate post project staff perceptions and knowledge the metabolic monitoring process. A graph will be used as a visual aide to compare pre/post survey data.

CHAPTER THREE

QUALITY IMPROVEMENT MANUSCRIPT

Contribution of Authors and Co-Authors

Manuscript(s) in Chapter(s) 3

Author: Amanda Marie Stone, DNP-PMHNP

Co-Author: Dr. Lindsey Davis

Co-Author: Dr. Alice Running

Manuscript Information

Amanda Marie Stone, Dr. Lindsey Davis, and Dr. Alice Running

Journal of the American Psychiatric Nurses Association

Status of Manuscript:
☒ Prepared for submission to a peer-reviewed journal
☐ Officially submitted to a peer-reviewed journal
☐ Accepted by a peer-reviewed journal
☐ Published in a peer-reviewed journal

SAGE Publications

Clinical Problem

An estimated one in five adults in the United States live with a mental health disorder, and 5% of this population experience a severe mental illness (SMI) (National Alliance on Mental Illness [NAMI], 2023). Current data reveals that 45.2% of Idahoans experiencing a mental illness are unable to receive the necessary psychiatric care, affecting the patient's psychological and physiological status (NAMI, 2021). Individuals with psychiatric disorders are at an increased risk for poor health outcomes, including cardiometabolic complications. Despite the effectiveness of second-generation antipsychotics (SGAs) symptom management, these agents are associated with an increased risk of mortality related to metabolic side effects (MSEs) and metabolic syndrome (Abdulhaq et al., 2021; Kornetova et al., 2020). The risk factors associated with metabolic syndrome (MetS) include abdominal obesity, dyslipidemia, hypertension, and insulin resistance (Kwobah et al., 2020; Sun & Jang, 2020). The prevalence of MetS in those prescribed an SGA is 53% compared to 23%, as observed in the general population (Fontaine et al., 2022; Poojari et al., 2023). Current evidence reveals the ongoing need for proactive metabolic monitoring (MM) in SGA use to address MSEs and reduce the rate of MetS.

Despite the emphasis on routine MM in SGA use, suboptimal trends remain within the mental health setting (Bomboy et al., 2021; Soda et al., 2021). At an outpatient mental health clinic in southwestern Idaho, metabolic screening was rarely documented in patients over the age of 18 prescribed an SGA. A 12-month retrospective chart review at the project site reveals that blood pressure (BP), body mass index (BMI), glucose, and lipid monitoring are 80%, 28%, and 8.2%, respectively. Through routine MM, clinicians can reduce the disease burden for patients prescribed SGAs and improve health outcomes.

Review of Literature

Metabolic monitoring is recommended per the American Psychiatric Association (APA) and American Diabetes Association (ADA) consensus statement and should be routinely completed in the mental health setting in patients prescribed an SGA. Evidence reveals yearly glucose, lipids, and BP monitoring rates as 71%, 45%, and 69%, respectively (Bomboy et al., 2021; Fontaine et al., 2021). Early recognition of MSEs can improve the patient's quality of life, medication adherence, and patient outcomes while reducing associated comorbidity and mortality risks (Bomoboy et al., 2021). Efforts to improve routine monitoring may include increased care collaboration between mental health and primary care providers and enhancing MM training and education for providers.

Numerous studies demonstrate that MM improves provider awareness and recognition of MSEs in SGA use, affirming its effectiveness and feasibility. Hackett & Fitzgerald (2020), Soda et al. (2021), Porter & Aggar (2021), and Viglione & Short (2021) found that provider education regarding the importance of routine MM increased provider compliance with the ADA/APA guidelines. Bomboy et al. (2021) used an electronically integrated MM tool to promote adherence. Cohen et al. (2020) found that electronic decision support tools such as electronic health record (EHR) and best practice alerts (BPAs) increased MM.

Conceptual Framework

The QI project consisted of three interventions: standardized MM protocol in SGA use; creation of an EHR "macro;" and provision of educational in-services. Patients were excluded if they were an established patient or aged 17 and younger. The EHR macro provided a

standardized documentation template for metabolic screening based on the ADA/APA metabolic monitoring clinical practice guidelines. Each provider had to enter the EHR macro individually as the clinic lacked an informatics/information technologies department. To increase clinician adherence to the MM guidelines, printed paper reminders of the clinic's standardized metabolic monitoring protocol and EHR macro were created and posted in the clinic. There were two educational monthly in-services and bi-weekly check-ins during the intervention phase. During the first staff meeting, clinicians were educated and verbalized understanding of the purpose of MM within SGA use and the EHR macro. The subsequent meetings were used to present current findings. Informal bi-weekly check-ins addressed questions and served as a reminder to complete MM.

The Plan-Do-Study-Act (PDSA) cycle will be utilized for this QI project because of its simplicity and effectiveness (Institute of Health Improvement (IHI), 2017). This QI framework is flexible by promoting small to moderate process improvement interventions. Most importantly, the PDSA model allows for real-time feedback from key stakeholders by continuously assessing process improvement initiatives. Since the clinical site is small, utilizing a simple and cost-effective model is important to improve patient outcomes and provider buy-in.

Within the "plan" stage, key stakeholders identify the change (e.g., the standardized MM in SGA use). In the "do" stage, the proposed intervention is implemented into clinical practice. The "study" phase allows for the review of available data on the proposed initiative. At the "act" phase, the intervention initiatives will be adjusted, adapted, or abandoned based on the data and feedback collected during the PDSA cycle.

Rationale and Project Aims

This QI project aimed to examine the effectiveness of integrating cardiometabolic side effect education and a standardized clinical protocol for MM in new psychiatric evaluations in individuals over 18 who were prescribed an SGA to improve health outcomes. The primary goal was to maintain an 80% adherence rate to BP documentation within 8 weeks. The secondary goal of this DNP project was to achieve an 80% adherence rate to documented BMI and blood work (e.g., glucose and lipids).

Methods

Context

The project was conducted in an outpatient mental health clinic in southwestern Idaho. The office employed seven psychiatric mental health nurse practitioners (PMHNPs), one office manager, one receptionist, and one medical assistant (MA). Mental health care was delivered to pediatric, adult, and geriatric patients, with an estimated 16 new patient encounters per week. There was a total sample size of 319 patients, with 193 in the preintervention phase and 126 in the postintervention phase.

Interventions. QI project consisted of three interventions: standardized MM protocol in SGA use; creation of an EHR "macro;" and provision of educational in-services. Patients were excluded if they were an established patient or aged 17 and younger. The EHR macro provided a standardized documentation template for metabolic screening based on the ADA/APA metabolic monitoring clinical practice guidelines. Each provider had to enter the EHR macro individually as the clinic lacked an informatics/information technologies department. To increase clinician

adherence to the MM guidelines, printed paper reminders of the clinic's standardized metabolic monitoring protocol and EHR macro were created and posted in the clinic. There were two educational monthly in-services and bi-weekly check-ins during the intervention phase. During the first staff meeting, clinicians were educated and verbalized understanding of the purpose of MM within SGA use and the EHR macro. The subsequent meetings were used to present current findings. Informal bi-weekly check-ins addressed questions and served as a reminder to complete MM.

Measures. The first aim was measured via preintervention and postintervention rates of documented BP in individuals prescribed an SGA. The secondary aim was to measure preintervention and postintervention rates of documented BMI and blood work (e.g., glucose and lipids). The data collection process consisted of obtaining data from both patients and providers. Patient data included variables such as BP, BMI, and lab work (e.g., glucose, lipids), while providers took a survey with Likert-scale responses to assess their perspectives on MM. The patient rates were evaluated by calculating the total of participants with documented BP, BMI, and blood work compared to those who met the inclusion criteria.

Statistical Analysis. Descriptive statistics were used to describe the frequency and percentage of categorical variables (BP [yes or no], BMI [yes or no], glucose [yes or no], lipid [yes or no]). Data consisted of those who did not receive an SGA (n=99) and those prescribed an SGA (n=27) during their initial visit. There are two sections involved with the provider survey. The first section evaluates the frequency of MM (always, usually, sometimes, rarely, never), while section two assesses barriers within the clinical setting (always, usually, sometimes, rarely, never). Data visualization tools were created to convey the results.

Ethical Considerations. The Montana State University Institutional Review Board reviewed the project and deemed it a quality improvement. Evidence-based clinical practice was observed. All data collection, including BMI, BP, blood work, and provider surveys, were de-identified and stored in a password-protected Excel spreadsheet at the project site. Patient charts were only accessed if the project criteria were met.

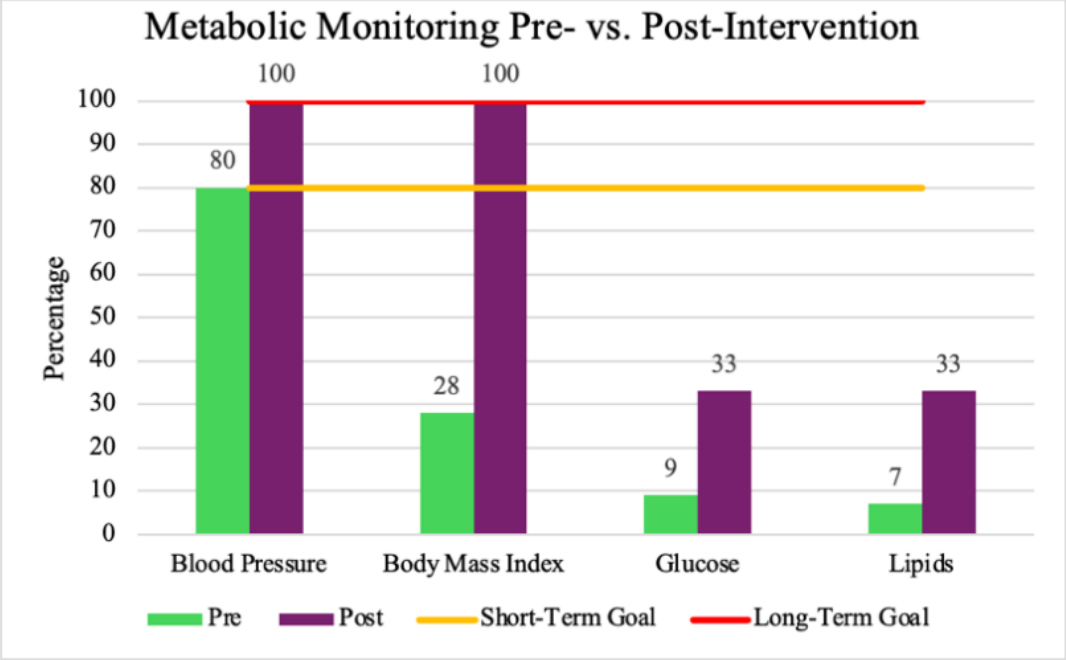
Results

Seven PMHNPs, one medical assistant, one receptionist, and one office manager participated in this QI project. All the providers attended the MM educational session. Eighty-five percent of providers completed the pre-and post-intervention surveys. Chart reviews were conducted on all new patient appointments between January 18, 2024, and March 14, 2024. The DNP student analyzed the presence of MSE discussions and the metabolic screening rate within the EHR weekly. These retrospective chart audits revealed 126 new patient appointments; 21% (27/126) were prescribed an SGA during their initial intake. The clinic averaged 16 new patient appointments each week.

The primary goal of maintaining an 80% adherence rate to BP was surpassed. Compared to the 80% completion rate in the pre-intervention phase, there was a 100% adherence rate in the post-intervention period. The secondary aim of increasing appropriate BMI documentation from a rate of 28% to 80% post-intervention was achieved. Completion rates for BMI increased to 100% throughout the implementation period. An 80% completion rate still needs to be achieved for lab work. Appropriate lab monitoring improved from an 8.5% rate during the preintervention phase to a rate of 33% postintervention. Figures 1 through 2 depict the adherence to the goals of this QI project. Approximately 57% of providers completed all the MM parameters (e.g., BP,

BMI, glucose, and lipids). These results demonstrate the need for routine MM educational sessions to promote provider adherence.

Figure 1: Rate of Metabolic Monitoring



There was an interesting shift in survey data regarding MM practices among providers throughout the QI project. In the pre-intervention phase, 66.7% of the clinicians reported *always* obtaining a baseline BP and BMI, compared to 33% in the post-intervention period. There was also a decrease in *always* obtaining lab work. The rate dropped to zero percent post-intervention compared to 33% in the pre-intervention period. Difficulty accessing lab data decreased by a rate of 33% post-intervention. Compared to pre-intervention data, provider responses identifying patient nonadherence to MM and poor care coordination as barriers increased by 50%. Participant perceptions regarding support staff availability, training, and patient financial hardship did not change, with 50% of the providers still identifying this as a barrier. These

findings are consistent with existing research indicating poor EHR interoperability, patient financial hardships, lack of education and awareness, and insufficient system-level support as barriers to MM in SGA use (Abdulhaq et al., 2020; Poojari et al., 2023; Porter & Aggar, 2021).

Discussion

The ADA/APA consensus statement recommends routine metabolic screening within the mental health setting in adults over the age of 18 prescribed an SGA. The MM risk screening tool should be initiated in mental health, and a standardized workflow is recommended. This project confirmed that a multifaceted approach can increase metabolic screening within mental health clinics. The project revealed that BP documentation rates were reported in 100% of patients prescribed an SGA compared to 69% seen within the literature findings. Similarly, there was a 100% adherence rate to BMI reporting compared to 28% of patients on an SGA. While there was a 33% increase in laboratory monitoring, the clinic remained below the literature findings of 45%. Overall, the appropriate MM improved for all providers to a rate of 57% during the 8-week timeframe.

Throughout the implementation period, the project's initiative was adjusted. The proposed EHR macro was abandoned after the first PDSA cycle as the clinic lacked an informatics department to help with dissemination. While this was a loss, the providers mutually agreed to select risk for MSEs, including MetS, under the informed consent section in the EHR. Printed paper reminders and provider education helped increase provider MM awareness; however, these interventions were not as effective in improving the completion rate of MM.

Another adaptation was establishing a new workflow to track blood work due to the clinic's limited EHR interoperability. During the second PDSA cycle, the clinic established a

password-protected Excel spreadsheet limited to clinicians and support staff. The providers were instructed to document the patient's medical record number, labs ordered, and lab facility. The medical assistant was asked to check the spreadsheet twice weekly. Following the post-intervention period, there were 23 documented lab requests, with 4% of patients prescribed an SGA.

There was a noticeable change in how providers viewed their clinical practice concerning MM according to the pre-and-post-intervention phase. This may be related to clinicians needing to overestimate their prescribing habits. The pre-implementation survey was administered in person shortly after providers received MM education, whereas the post-intervention survey was distributed online at the end of the project. While it is difficult to say, providers may have felt more comfortable with the online survey due to being anonymous.

Limitations

One fundamental limitation was the need for an informatics department to help disseminate the proposed EHR macro. While the providers were motivated to add the macro to clinical practice, it remained challenging. Another ongoing barrier was the variable MM practices among the providers. At the beginning of the project, there was a high rate of provider and support staff turnover. Until additional employees were hired, the two medical assistants had multiple responsibilities, including, but not limited to, completing pre-authorizations, obtaining lab work, sending prescription refills, scheduling appointments, requesting medical records, and giving long-acting injections. Providers were apathetic to completing routine MM due to the logistics of the clinical practice.

Recommendations. Through routine MM, healthcare providers can reduce disease morbidity and mortality in patients prescribed an SGA and improve health outcomes. Implementing a standardized MM protocol is a cost-effective, evidence-based intervention to reduce the risk of MSEs and MetS within this subpopulation subset. Healthcare organizations should consider using an EHR macro or BPA to aid in proper MM practices. Electronic health record-based reminders can help disseminate clinical practice guidelines.

In addition, these reminders can be interruptive, requiring clinicians to know current recommendations and acknowledge the alert before delivering care. Furthermore, healthcare professionals should consider incorporating a standardized communication style regarding informed consent and metabolic risks for SGAs before prescribing such agents. Standardizing patient education can promote consistency, reduce healthcare expenditure, and improve the quality of care and health outcomes. Establishing a solid foundation, strong leadership skills, and a supportive work environment is imperative to the success of any organizational change.

Conclusion

This QI project aimed to implement a standardized MM process in patients prescribed an SGA in an outpatient mental health clinic to increase the early recognition of MSEs. The project effectively increased the rate of MM in individuals prescribed an SGA. Nonetheless, project site data matched suboptimal MM trends commonly seen in literature findings. Before implementation, all the providers received education regarding the QI initiative and MSE education. Initially, the provider survey demonstrated clinical practice variations among providers. After this project, the post-intervention survey revealed a moderate change in clinical practices. While SGAs continue to play an essential role in treating and managing psychiatric

disorders, these agents place individuals at a higher risk for comorbidity and mortality than the general population. Due to the high disease burden risk, healthcare providers must stay vigilant in their monitoring practices. Consistent application of metabolic screening is essential to improve patient health outcomes and reduce disease morbidity and mortality.

CHAPTER FOUR

ADVANCED NURSING ESSENTIALS REFLECTION

Domain 1: Knowledge of Nursing Practice

Domain I, Knowledge for Nursing Practice, requires a scientific understanding of current evidence-based practice across multiple disciplines, including liberal arts and social sciences. The Doctor of Nursing Practice (DNP) student conducted a comprehensive literature review to better understand the increased risk of early mortality and disease morbidity in individuals with an SMI and how to address patient-centered care within the DNP project adequately. The foundations of Evidence-Based Practice, Advanced Pathophysiology, and Advanced Psychopharmacology provided the DNP with the necessary framework and understanding of integrating patient-centered care into clinical practice and reasoning. Through the educational material offered by Vulnerability and Health Care in Diverse Communities, Healthcare Design, and Leadership, the DNP student demonstrated the necessary leadership characteristics to implement a quality improvement project within a healthcare organization providing care to improve patient health outcomes in a vulnerable population. The theories of science and nursing were embedded throughout the entire DNP curriculum. To demonstrate the highest level of nursing practice, the DNP student utilized ethical, analytical, and biopsychosocial science throughout the quality improvement project. In conclusion, a doctoral-prepared nurse should be able to synthesize and implement evidence-based practice interventions into high-quality, patient-centered care.

Domain 2: Person-Centered Care

Person-centered care, domain 2, is one of the core competencies of the nursing discipline. This domain focuses on providing the best evidence and clinical judgment in the planning and delivering patient care. The doctoral-prepared nurse must demonstrate holistic, individualized, compassionate, and coordinated patient care. The DNP student demonstrated healthcare leadership within the project by developing a new policy and procedure based on current literature findings. To achieve this competency, the doctoral-prepared nurse must be able to evaluate, translate, and disseminate research into practice using interdisciplinary collaboration. The intervention incorporated provider education and metabolic side effect (MSE) screening. The project aimed to implement baseline and routine MSE screening into the clinical workflow. The DNP student utilized Plan-Do-Study-Act (PDSA) cycles, data huddles, and provider feedback to ensure the MSE screening process became part of the daily workflow, especially in all new patient appointments where an individual was prescribed an SGA. Throughout the project, data was monitored, analyzed, and presented to provide transparency and accountability for ongoing gaps and inconsistencies within the workflow. The 8-week implementation period allowed for multiple PDSA cycles to test the quality improvement initiatives and allow for any necessary adaptations to prevent and reduce adverse outcomes. Despite the evidence, there is no incentive to perform MSE screening and monitoring within the mental health setting. One way to increase adherence rates is to create a national core measure aligned with the Institute for Healthcare Improvement Triple Aim framework.

Doman 3: Population Health

Population Health, Domain 3, encompasses the ability of the doctoral-prepared nurse to collaborate with the interdisciplinary team in identifying, developing, and evaluating cost-effective interventions to improve patient healthcare outcomes through clinical workflows and processes. This DNP project highlights the importance of deciphering current biases, barriers, and limitations impacting population health outcomes. Through epidemiological data analysis, the DNP student could develop, implement, and evaluate evidence-based practice interventions to improve health outcomes for the severe mental illness population. The DNP student developed a collaborative approach with key stakeholders to address the need for MSE screening within the mental health population. In addition, the DNP student challenged healthcare providers to address ongoing barriers and biases to MSE screening. Lastly, since the project site needed an informatic department to help disseminate the proposed electronic health record (HER) macro, the DNP student strategized with stakeholders to develop a cost-effective and sustainable approach to MSE screening documentation.

Domain 6: Interprofessional Partnerships

Domain VI, Interprofessional Partnerships, refers to the intentional care collaboration between the interdisciplinary team, the patient, family members, and other stakeholders to enhance the healthcare experience and strengthen outcomes. The DNP student took an active leadership role and worked with the interprofessional team to analyze current practices, systems issues, and barriers to delivering high-quality patient care. The doctoral-prepared nurse assisted in implementing the MSE screening protocol, listening to staff feedback, and revisiting the

workflow to improve team dynamics and desired outcomes. Throughout the project, the DNP student fostered an environment that supported constructive sharing from multiple perspectives and enhanced interprofessional understanding and learning. Additionally, this project encouraged the doctoral-prepared nurse to self-reflect and assess how implicit biases toward other professionals may impact interdisciplinary care coordination and health outcomes.

Domain 8: Information and Health Technologies

Information and Health Technologies, Domain 8, gathers supportive data to drive clinical decision-making practices. At the project site, providers used the EHR system to document this clinical assessment and treatment plan; however, there was no standardized workflow regarding MSE screening and monitoring in second-generation antipsychotic (SGA) use. Additionally, the project highlighted the ongoing barriers commonly seen within the mental health setting due to poor EHR interoperability and subsequent impact on patient-centered care. The project worked to integrate consistent MSE monitoring by having the providers document within the EHR system. The organization continues to use this type of documentation to improve health outcomes. The DNP worked with the clinic to identify and evaluate potential ethical and legal issues associated with using and storing protected health information outside Health Insurance Portability and Accountability Act (HIPAA) compliant software. The DNP demonstrated the ability to use technical skills to develop, deliver, and extract data from the clinic's EHR system. The DNP student extracted data from the EHR weekly to assess adherence to the standardized protocol and communicated findings to promote MSE monitoring and management.

Conclusion

I have integrated these core competencies throughout my doctoral journey. The Montana State University curriculum has provided me with a comprehensive skillset necessary to become an independent practitioner. Additionally, this program has provided a solid foundation for translating, integrating, and applying nursing knowledge into clinical practice. As a future provider, I will be a strong nurse leader and contribute to the evolution of mental healthcare.

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APPENDIX

PROVIDER SURVEY

Table A1. Provider Survey. (Adapted from Mangurian et al., 2019 - Opinions of Primary Care Clinicians and Psychiatrists on Monitoring the Metabolic Effects of Antipsychotics)

Provider Assessment Practices in Prescribing Antipsychotics					
	Always	Usually	Sometimes	Rarely	Never
Blood pressure					
Body mass index					
Glucose					
Lipid panel					

Provider Perceptions: I believe the following staffing or physician factors (at your primary care clinic) are a barrier to monitoring patients for metabolic risk:					
	Always	Usually	Sometimes	Rarely	Never
Insufficient support staff availability.					
Insufficient support staff training					
Difficulty accessing laboratory data					
The patient does not comply with recommendations					
Metabolic monitoring is a significant financial burden					
Difficulty with care coordination with primary care provider					

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