

Implementing the Abnormal Involuntary Movement Scale AIMS As an Evidence Based Practice Screening Tool in Adult Patients Taking Antipsychotics to Detect and Treat Tardive Dyskinesia

Nkeiruka Madubueze^{1*}, Linda Sue Hammonds² and Erik Lindfors³

¹College of Nursing, University of South Alabama, United States

²Clinical Faculty, College of Nursing, University of South Alabama, United States

³Department of Admissions, Austin State Hospital, Austin, United States

Abstract

Background: Tardive Dyskinesia (TD) is possibly a permanent involuntary movement condition that is caused by all antipsychotics including atypical antipsychotics and typical antipsychotics. TD is also a socially stigmatizing disorder. The most recommended management strategy for TD is prevention.

Objective: The aim was to improve quality of care for patients with the implementation of the Abnormal Involuntary Movement Scale (AIMS) as a screening tool in adult patients aged 18 to 65 years old taking antipsychotic medications.

Methods/Design: This was a quality improvement project. A total of 60 adult patients were recruited but only 40 participated in the quality improvement project. The Abnormal Involuntary Movement Scale as a screening tool was implemented in the outpatient private practice from September 15 through November 16, 2018. The screening tool was implemented by the Doctor of Nursing Practice (DNP) student during each patient visit, followed by a review of scores to increase screening for TD. The DNP student was able to improve patient outcomes by identifying TD and making referrals for treatment. The World Health Organization Quality of Life instrument (WHOQOL-BREF) was used to assess the quality of life of patients taking antipsychotics.

Results: The implementation of the AIMS in the routine monitoring for TD in adult patients improved patient outcomes with detection and treatment of tardive dyskinesia in adult patients taking antipsychotic medications with increased screening protocol from 0% to 80% within 12 weeks. The WHOQOL-BREF assessed the quality of life of adult patients taking antipsychotics and did not indicate any changes in the quality of life of patients.

Conclusion: Implementing the AIMS improved quality of care in adult patients taking antipsychotics in the outpatient private practice.

Keywords: Antipsychotics; Abnormal Involuntary Movement Scale (AIMS); Adult patients; World Health Organization Quality of Life instruments; Tardive dyskinesia

Introduction

Implementing the Abnormal Involuntary Movement Scale (AIMS) as an Evidence-Based Practice Screening Tool in Adult Patients Taking Antipsychotics to Detect and Treat Tardive Dyskinesia in an Outpatient Private Practice: A Quality Improvement Project Caution should be applied with the use of antipsychotics in patients. In addition, risk factors such as drug induced parkinsonian symptoms and the administration of anticholinergic medication should be monitored. To reduce harm, decrease significant functional impairment and social stigmatization associated with TD, it is important to screen patients taking antipsychotics for TD [1]. The purpose of this quality improvement project was to improve quality of care for patients by implementing the Abnormal Involuntary Movement Scale (AIMS) as an evidence-based screening tool in adult patients taking antipsychotics to detect and treat tardive dyskinesia in an outpatient private practice. During each patient visit, the AIMS were implemented by the Doctor of Nursing practice (DNP) student along with a review of scores to increase screening for TD. The DNP student was able to improve patient outcomes by identifying TD and making referrals for treatment. TD is a socially stigmatizing condition. TD is also a possibly permanent involuntary movement syndrome from extensive use of Dopamine Receptor-Blocking Agents (DRBAs). Amongst others, DRBAs include antipsychotics [2]. TD has a high incidence of 20%-25% and has been

linked to poor quality of life in patients taking antipsychotics. Routine screening for the development of TD symptoms is strongly encouraged in clinical settings for early detection and treatment to provide relief from this condition [3]. It is recommended that the healthcare providers implement the AIMS in screening for TD in clinical practice for prompt intervention.

Description of the Problem

Yanan et al. argued that detection of TD is relevant to nursing practice for the improvement of social interaction, quality of life and advancement of medication adherence in patients [4]. With the high annual healthcare cost of \$54, 656, there is a need for TD to be addressed by the healthcare provider. The higher healthcare cost was primarily because patients with TD experienced hospitalizations (56%

*Corresponding author: Nkeiruka Madubueze, College of Nursing, University of South Alabama, United States, Tel: 573-353-3964; E-mail: nom1521@jagmail.southalabama.edu

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and 17% for mental healthcare costs) and emergency room visits (62%; mental healthcare cost 27%) [5].

In the outpatient private practice, mental health care is provided to approximately 14 patients daily. Ultimately, there are approximately 98 patients whom are provided mental healthcare on a weekly basis. This means that there are approximately 300 adult patients who receive mental health care in the outpatient private practice. The minimum age of the patients is 18 years old. After conducting a retrospective chart review over a period of 3 months, there was no available data on patients being screened at the setting for TD. The quality of life of patients taking antipsychotics is affected because they are not being screened or treated for TD. These patients may stop taking their antipsychotics due to the adverse effect of TD. In addition, social interaction may be highly comprised because of the complication of TD. There was a need for screening of TD with the use of the AIMS to prevent harm in adult patients taking antipsychotics.

Aims

The aim of the quality improvement project was to improve patient outcomes with detection and treatment of tardive dyskinesia in adult patients taking antipsychotic medications with increased screening protocol from 0% to 80% within 12 weeks. In addition, provide education on TD to adult patients taking antipsychotics. Finally, improve quality of life of patients with the use of the WHOQOL-BREF instrument.

Three objectives were identified for implementation in the QI project. These objectives included increased education to staff and patients on the importance of detection of tardive dyskinesia to 80% within 12 weeks, increased screening of patients taking antipsychotic medications using the AIMS to improve detection of tardive dyskinesia to 80% within 12 weeks, and improvement in quality of life with management of tardive dyskinesia detected in adult patients to 75% within 12 weeks.

Quality Improvement (QI) Model

Plan-do-study-act (pdsa) model

A model was needed in the quality improvement project. The model was necessary to test and implement changes to increase the rate of detection and treatment of TD in adult patients in the outpatient private practice. The PDSA model was deemed the best fit for implementing, testing and evaluating the use of the AIMS as a screening protocol for TD (See Appendix A in Figure 1 for more detailed information) [6].

Plan

The plan was to derive a sense of current patient awareness of TD in patients taking antipsychotics at the outpatient private practice. Possible recognition of the need for a review of detection and treatment of TD was also included in the plan. To get this feedback, a structured form involving a yes/no/not sure format with room for some comments was created. Questions were formulated to collect information on: what patients knew about TD and management; where patients got their information from; whether patients wanted more information and where from; and how patients felt about management strategies of TD (Appendix B).

Appendix B

Patient Questionnaire

1. Do you know what tardive dyskinesia is? yes no not sure .

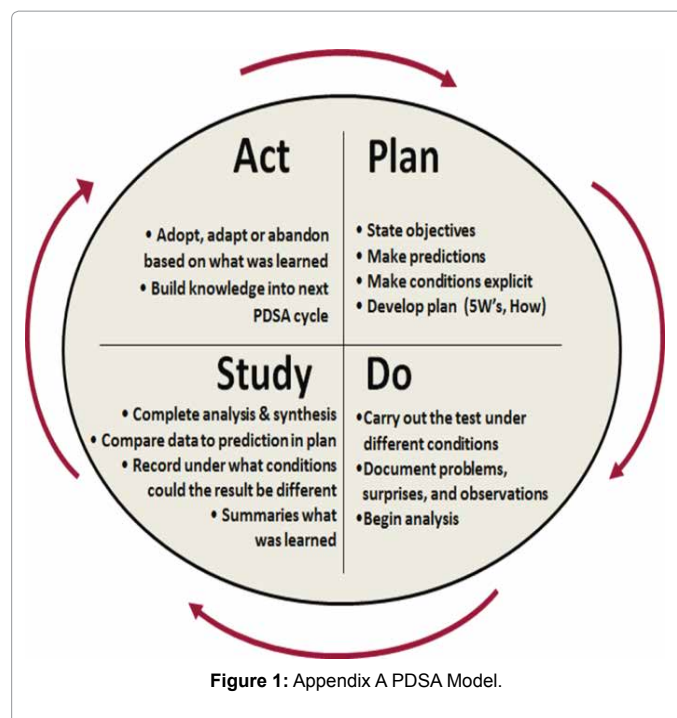


Figure 1: Appendix A PDSA Model.

2. Do you know the signs and symptoms of tardive dyskinesia? yes no not sure .
3. Has your healthcare provider ever explained about tardive dyskinesia to you? yes no not sure .
4. Do you know how to contact your healthcare provider about tardive dyskinesia? yes no not sure .
5. Are you open to receiving information on tardive dyskinesia? yes no not sure .
6. If you do know about tardive dyskinesia, are you aware of the treatment options? yes no not sure .
7. Do you know about the abnormal involuntary movement (AIMS)? yes no not sure .
8. Do you have any concerns about participating in a project to reduce the incidence of tardive dyskinesia? yes no not sure .

Do

The structured form was given to patients to complete at their scheduled visits with the DNP student at the outpatient private practice. Feedback from the structured form guided the next step which was the study.

Study

Results from the structured form provided feedback on patients' responses. Inputs from the stakeholders were taken into consideration during this stage.

Act

The AIMS was conducted by the DNP student during visits with adult patients taking antipsychotics. The DNP student provided education during each visit while implementing the AIMS to detect and

treat TD. The patients were encouraged to ask any questions that they had during these visits. A flowsheet was saved in each patient's charts and used for comparison during follow up visits.

A desired outcome from implementing the QI project in the outpatient private practice included an improvement in the quality of life with management of TD detected in adult patients taking antipsychotics to 75% within 12 weeks. The structural outcome was the presence of the outpatient private practice located in the community for the assessment of TD to decrease the rate of TD to 30% within 12 weeks. The process outcome of the QI project entailed the increase in patient education from 35% to 80% within 12 weeks of implementation of the

AIMS at initial and follow up visits to increase the rate of detection and treatment of TD [6].

Evidence-Based Practice (EBP) Model

The Iowa Model of Evidence-Based Practice (EBP) model can assist healthcare providers in translating research findings into clinical practice and improving patient outcomes. The first step in the Iowa Model is the identification of either a problem- focused trigger or a knowledge-focused trigger where an EBP change is needed (Appendix C) in (Figure 2) [7].

In the QI project, the first step was to identify the existence of the

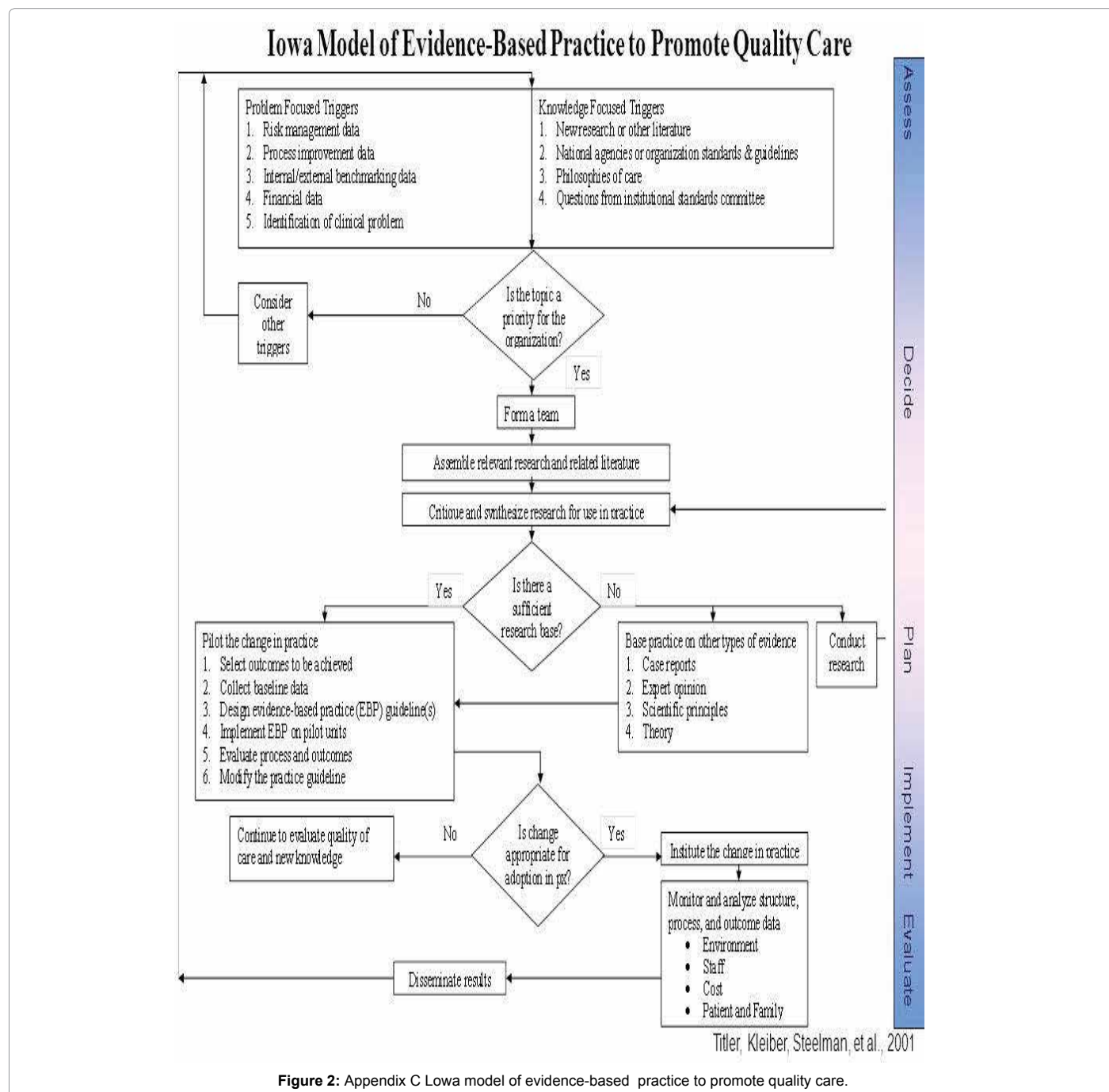


Figure 2: Appendix C Iowa model of evidence-based practice to promote quality care.

lack of screening for TD with the use of the AIMS in adult patients taking antipsychotics as the problem-focused trigger. The next step involved identifying that the problem was a priority in the organization. The outpatient private practice treats approximately 14 adult patients daily and 98 patients weekly. Many of them were being prescribed antipsychotics for various psychiatric disorders. There was a likelihood that some patients will develop TD at some point during treatment. It was imperative that these patients are screened to detect and treat TD. The next step was forming a team to develop, evaluate, and implement the EBP change. In the outpatient private practice, the psychiatric nurse practitioner, the psychiatrist and the DNP student were members of the team who developed, evaluated, and implemented the QI project of using the AIMS as a screening tool to detect and treat TD in adult patients taking antipsychotics. The DNP student was the leader of the team.

The next step was to gather, and critique important research related to the selected practice change of increasing the screening rate for TD in adult patients taking antipsychotics. At this step, the PICO question was formed. Evidence-based practice articles and guidelines were reviewed by the DNP student to critique available studies on the implementation of the AIMS in practice and the available results [7].

The team then implemented the intervention into a pilot change. Since the outpatient private practice was a small practice, the intervention of implementing the AIMS as a screening protocol for adult patients taking antipsychotics was conducted on these patients gradually. During this step, evaluation of the practice change was done frequently for a decrease or change in patient outcomes [7].

Nursing Theory

The Kurt Lewin's Change theory was the best fit for the quality improvement practice problem. This change model of unfreeze, change and refreeze guided the process of change in the setting. The unfreeze phase is the system of seeking a new way for individuals to discard the old way of performing tasks that is counterproductive (Appendix D) (Figure 3) [8].

The AIMS replaced the old pattern of not using any screening protocol to detect and treat TD. The change stage involved a change in the cognition, feelings and behaviors to accept the new change in

practice of using the AIMS tool as a screening protocol. The refreeze stage involved using the AIMS as the standard screening protocol to detect and treat TD in the setting for adult patients taking antipsychotics.

Literature Review

A review of literature was conducted through Cumulative Index to Nursing and Allied Health Literature (CINHAL), Public/Publisher MEDLINE (PubMed), and Psychological Information (PsycINFO) databases for relevant articles related to tardive dyskinesia in the population of patients taking antipsychotics. Searches for articles were conducted on these databases from 2013 to 2018. The results reviewed that the AIMS is considered the standard for screening for TD. In addition, TD is not uncommon in patients taking typical and atypical antipsychotics [1,4]. Stegmayer et al. supports that although the peril of TD is lower with atypical antipsychotics compared to typical antipsychotics, the risk remains constant due to the problem of the high number of atypicals still being prescribed [9]. Some of the risk factors linked with TD include the period of antipsychotic use, age, and ethnicity other than Caucasian.

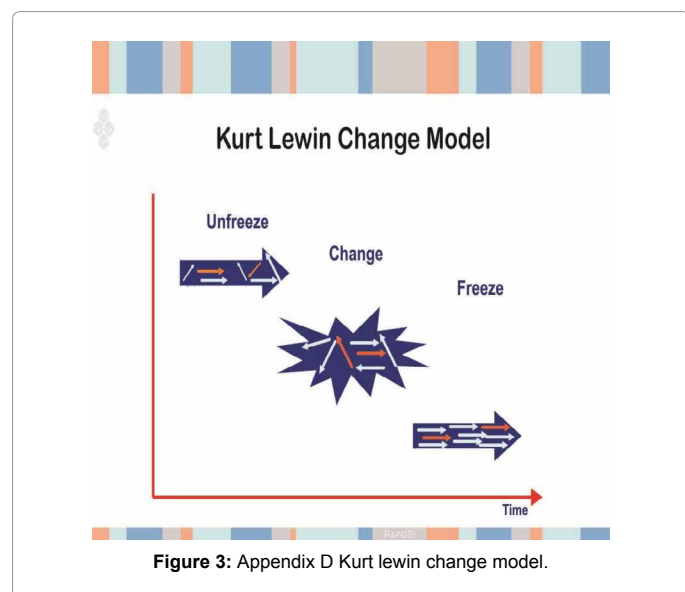
Studies conducted on the management of TD have considerable methodological limitations. However, the best management strategy remains prevention. The healthcare provider must use caution when prescribing antipsychotics and perform regular screening for TD. Other strategies may include reduction in the dosage of the atypical antipsychotic, switching to clozapine, or administering Vesicular Monoamine Transporter (VMAT)-2 inhibitors [2]. In addition, Khouzam, supports that the AIMS is widely used to detect TD and to track its severity periodically [2]. The quality of life of patients who develop TD can be hugely affected. Significant prevention of TD is related to management of risk factors, early detection, and treatment of individual incidents. It is extremely important for healthcare providers to monitor patients who are maintained on antipsychotics to detect and treat the emergence of TD appropriately.

The American Psychiatric Association practice recommends that during the treatment of patients taking an antipsychotic medication, regular monitoring for movement disorders should be done. In persons taking a typical antipsychotic, it is recommended that the screening for TD occur every 6 months and every 12 months if on atypical antipsychotics. Patients with more risk factors for TD should be screened more frequently such as every 3 months for typical antipsychotics and every 6 months for atypical antipsychotics [1].

Methods/Design

The quality improvement project was created to answer the PICO question: In adult patients aged 18 to 65 years old taking antipsychotic medications, does implementing the Abnormal Involuntary Movement Scale (AIMS) as an evidence-based practice screening tool within 12 weeks compared to no AIMS assessment increase the rate of detection and treatment of Tardive Dyskinesia (TD) in an outpatient private practice?

The project team leader was the Doctor of Nursing practice (DNP) student at the University of South Alabama. Since the project involved human participants and was led by a student, approval was obtained from the Institutional Review Board (IRB) at the University of South Alabama. Approval of the IRB in the outpatient private practice was not required rather the advanced practice nurse gave her approval and support for the DNP student to implement the quality improvement project in the setting.



Participants

Inclusion criteria

These included (1) Patients between the age of 18 and 65 years old; (2) Diagnosed with psychiatric disorders according to the criteria of the International Classification of Diseases and Related Health Problems, 10th edition (ICD-10); (3) Taking antipsychotic medications for or over one year; (4) Patients who could complete the AIMS test and give verbal consent; (5) Patients who spoke and understood the English language.

Exclusion criteria

These included (1) Patients younger than 18 and older than 65 years of age; (2) Patients with other severe comorbid medical conditions; (3) Patients who had comorbid neurological diseases; (4) Patients unable to complete the AIMS test; (5) Patients who did not speak or understand the English language.

Tools

The AIMS was implemented to screen for TD and collect data on adult patients aged 18 to 65 years who were taking antipsychotics (Appendix E) in (Table 1).

The World Health Organization Quality of Life instrument (WHOQOL-BREF) was used to evaluate the quality of life of adult patients in the QI project (World Health Organization [WHO], 2011) (Appendix F) in Table 2.

Interventions and Data Collection

Prevention is the most effective approach for the management of TD. Prudence should be used when ordering antipsychotics with routine monitoring for detection of TD. Other strategies may include

decreasing the dosage of the antipsychotics, changing to atypical antipsychotics, decrease or cessation of antipsychotic drugs, or an antioxidant, cholinergic or anticholinergic drugs, benzodiazepine or other GABAergic drugs, switching to clozapine, or administering vesicular monoamine transporter (VMAT)-2 inhibitors. In severe cases, local injections of botulinum toxin or deep brain stimulation may be considered as recommended by the American Academy of Neurology [1].

Data was collected from patients on Wednesdays, Thursdays and Fridays at the outpatient private practice. The length of time for data collection was from September 15 to November 16, 2018. There were 60 participants recruited for the QI project but only 40 participated in the QI project. Verbal consents were obtained by the DNP student privately in the waiting room of the outpatient private practice for participation in the project. The DNP student explained the importance of screening for TD to all adult patients taking antipsychotics.

In week one of the QI project implementation, the DNP student provided educational sessions at lunch breaks with the advanced practice nurse and psychiatrist at the outpatient private practice. Pre-test interventions were conducted to evaluate the knowledge base of the stakeholders. The AIMS was explained and practiced during these educational sessions. In week 2, the DNP student started collecting data using the AIMS and the World Health Organization Quality of Life instrument (WHOQOL-BREF) on adult patients taking antipsychotics in the outpatient private practice.

In addition, referral for the use of a vesicular monoamine transporter (VMAT)-2 inhibitor, a reduction in the dosage of the antipsychotic and/or switching to a different antipsychotic were offered as treatment options for any patient detected with TD with a high score.

Movement Ratings: Rate highest severity observed. Rate movements that occur upon activation one less than those observed spontaneously. Circle movement as well as code number that applies.		Rater Date	Rater Date	Rater Date	Rater Date
Facial and Oral Movements	1. Muscles of Facial Expression e.g. movements of forehead, eyebrows, periorbital area, cheeks, including frowning, blinking, smiling, grimacing	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
	2. Lips and Perioral Area e.g., puckering, pouting, smacking	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
	3. Jaw e.g. biting, clenching, chewing, mouth opening, lateral movement	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
	4. Tongue Rate only increases in movement both in and out of mouth. NOT inability to sustain movement. Darting in and out of mouth.	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
Extremity Movements	5. Include choreic movements (i.e., rapid, objectively purposeless, irregular, spontaneous) athetoid movements (i.e., slow, irregular, complex, serpentine). do not include tremor (i.e., repetitive, regular, rhythmic)	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
	6. Lower (legs, knees, ankles, toes) e.g., lateral knee movement, foot tapping, heel dropping, foot squirming, inversion and eversion of foot.	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4	0 1 2 3 4
Trunk Movements	7. Neck, shoulders, hips e.g., rocking, twisting, squirming, pelvic gyrations	0 1 2 3 4	0 1 2 3 4		0 1 2 3 4
Global Judgments	8. Severity of abnormal movements overall	0 1 2 3 4	0 1 2 3 4		0 1 2 3 4
	9. Incapacitation due to abnormal movements	0 1 2 3 4	0 1 2 3 4		0 1 2 3 4
	10. patient's awareness of abnormal movements rate only patient's report No awareness 0, Aware, no distress 1, Aware, mid distress 2, Aware, moderate distress 3, Aware, severe distress 4	0	0		0
	11. Current problems with teeth and/ or dentures?	No Yes	No Yes		No Yes
	12. Are dentures usually worn?	No Yes	No Yes		No Yes
	13. Edentia?	No Yes	No Yes		No Yes
	14. Do movements disappear in sleep?	No Yes	No Yes		No Yes

Note: 0: None; 1: Minimal, may be extreme normal; 2: Mild; 3: Moderate; 4: Severe.

Table 1: Complete examination procedure (attachment the) before making ratings.

S. No		Very poor	Poor	Neither poor nor good	Good	Very good
1	How would you rate your quality of life?	1	2	3	4	5
2	How satisfied are you with your health?	Very dissatisfied	Dissatisfied	Neither satisfied nor	Satisfied	Very satisfied
		1	2	3	4	5
3	To what extent do you feel that physical pain prevents you from doing what you need to do?	Not at all	A little	A moderate amount	Very much	An extreme amount
		5	4	3	2	1
4	How much do you need any medical treatment to function in your daily life?	5	4	3	2	1
5.	How much do you enjoy life?	1	2	3	4	5
6.	To what extent do you feel your life to be meaningful?	1	2	3	4	5
7.	Do you have enough energy for everyday life?	Not at all	A little	Moderately	Mostly	Completely
		1	2	3	4	5
8.	Are you able to accept your bodily appearance?	1	2	3	4	5
9.	How satisfied are you with your ability to perform your daily living activities?	1	2	3	4	5
10.	How satisfied are you with your capacity for	1	2	3	4	5
11.	How satisfied are you with yourself?	1	2	3	4	5

Table 2: The world health organization quality of life (WHOQOL)-BREF .

By week eight, the QI project was reviewed for any adjustments. In week 12, posttest interventions were administered at this stage for comparison of the knowledge base of the stakeholders and patients. The QI project was completed. A post conference was held with the stakeholders for an explanation of the results of the QI project. Deutetrabenazine, a Vesicular Monoamine Transporter (VMAT)-2 inhibitor was approved by the U.S. Food Drug and Administration (FDA) on April 3, 2017 for the treatment of TD and chorea related movements in Huntington’s disease. An advantage of deutetrabenazine was that in the clinical trials, it was found to be less likely to cause sedation and depression in patients [10]. Due to this advantage, deutetrabenazine was decided as the best choice for the treatment of TD in adult patients taking antipsychotics in the outpatient private practice. Another intervention was to switch any adult patient diagnosed with TD to another antipsychotic that was less likely to cause TD in Table 3 [11].

Results & Discussions

There were 60 participants who were approached for participation in the QI project. The final number of patients who participated in the QI project was 40. See Table 4 for demographics. TD was identified in one patient with a high score of 13 and 3 for overall severity of symptoms on the AIMS tool. The patient who was identified with TD was a 64 years old Caucasian female diagnosed with bipolar II on lurasidone, an atypical antipsychotic. For treatment options, she was started on deutetrabenazine, lurasidone was switched to quetiapine, a referral to a neurologist and follow up visits were done at the end of the QI project.

Prior to implementation of the QI project in the outpatient private practice, no patients out of 40 were identified with TD. After implementation, 1 or 2.5% of 40 patients was identified with TD. This data indicates that the AIMS is an important tool for screening to identify and treat TD in adult patients taking antipsychotics.

The use of the WHOQOL-BREF instrument to evaluate the quality of life of adult patients taking antipsychotics was another important instrument used in the outpatient private practice. Prior to implementation of the WHOQOL-BREF instrument, no adult patients

Equations for computing domain scores		Raw score	Transformed scores*	
			4-20	0-100
Domain 1	$(6-Q3) + (6-Q4) + Q10 + Q15 + Q16 + Q17 + Q18 + D + D + D + D + D + D + D$	a. =	b:	c:
Domain 2	$Q5 + Q6 + Q7 + Q11 + Q19 + (6-Q26) + D + D + D + D + D + D$	a. =	b:	c:
Domain 3	$Q20 + Q21 + Q22 + D + D + D$	a. =	b:	c:
Domain 4	$Q8 + Q9 + Q12 + Q13 + Q14 + Q23 + Q24 + Q25 + D + D + D + D + D + D + D + D + D + D$	a. =	b:	c:

Table 3: The following table should be completed after the interview is finished.

Characteristics	n	%
Age (years)		
20–29	9	23
30–39	5	13
40–49	6	15
50–59	3	8
60–69	17	43
Gender		
Female	30	75
Male	10	25
Race		
Caucasian	35	88
African American	2	5
Hispanic	1	3
Asian	2	5
N = 40		

Note: Due to rounding, the total of all percentages does not add up to 100.

Table 4: Sample demographics.

out of 40 taking antipsychotics reported a decline in quality of life. After implementation of the project, there were no adult patients out of 40 who stated had a decline in quality of life.

Conclusion

Recognition of TD requires careful observation. Harm reduction from TD is possible when the AIMS is used as a screening tool to detect and support the treatment of TD. If the AIMS is used as a screening tool in the outpatient private practice, there will be a decrease in the emergence of TD and improvement in patient outcomes. The continuous use of the AIMS as a screening tool will also help prevent dysfunction or stress from the emergence of TD in adult patients in the outpatient mental health clinic. The success of the QI project was evident with the detection and treatment of TD in the adult female patient taking antipsychotics in the outpatient private practice.

Limitations of the Study

A limitation of the QI project was the short period of time allocated for the project. The short period of time was inadequate to collect enough data from participants. However, there was improvement in the quality of care of patients taking antipsychotics in the outpatient private practice. The success of the QI project was evident with the detection and treatment of TD in the adult female patient in the outpatient private practice.

Implications for Practice

At the end of the QI project, paper copies of the AIMS were placed in the outpatient private practice for the psychiatric nurse practitioner to use in screening and treating patients taking antipsychotics at initial and specified follow up visits. Education was provided to the psychiatric nurse practitioner to pass on to patients on the importance of detection and treatment of TD to improve quality of care of patients. The psychiatric nurse practitioner will provide treatment options such as using deutetrabenazine, switching to another antipsychotic less likely to cause TD or decreasing the dose of the antipsychotic and a referral to a neurologist to improve quality of care of patients.

Declaration of Conflicting Interests

The authors disclosed no potential conflicts of interest with respect to the QI project, authorship, implementation, and/or publication of this manuscript.

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