Improving Patient Safety through the Implementation of Abnormal Involuntary Movement Scale via Telepsychiatry

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Abstract

The sudden change to predominately telemedicine at a large Veteran Affairs (VA) Medical Center in the Pacific Northwest, resulting from the COVID-19 pandemic, has affected how medical providers practice. As a result, a problem was identified with concern to psychiatric providers not conducting medication-induced movement disorder assessments due to a lack of knowledge, which was causing delays in care for Veterans. This delay in care could have significant impact on Veterans health. The Abnormal Involuntary Movement Scale (AIMS) is the standardized assessment used by the VA providers typically done in person and there is little evidence-based practice concerning the efficacy of conducting AIMS assessments by video. Continuing education was provided to 11 Psychiatric Mental Health Nurse Practitioners (PMHNPs) at the VA Medical Center about conducting the AIMS assessment via video. Results suggested that after the continuing education intervention, a positive trend in pre- versus post intervention mean confidence scores video (M = 4.45 and M = 5.60) in performing AIMS via was found for PMHNPs respectively. Additionally, a positive trend in mean compliance (M = 4.72 and M = 5.60) with respect to VA recommended time intervals between AIMS was observed pre- versus post continuing education intervention. Results suggest that continuing education about performing the AIMS assessment by video to monitor for drug induced movement disorders was effective in both confidence in assessing and compliance in time between assessments three-months post intervention. With the growing necessity for telehealth services, more research will be required to inform best practice and provide valid assessment to healthcare providers in all disciplines to ensure the best health outcomes.

Keywords: Medication induced movement disorder, AIMS, Telehealth, Veterans

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Introduction

Problem Description

Within the Veteran Affairs (VA) healthcare system the majority of healthcare services have transitioned to telehealth where feasible as a result of the COVID-19 pandemic (VHA, 2020). The way in which care is delivered has changed for both patients and providers. Specifically, monitoring for drug-induced movement disorders within the Veteran population being prescribed antipsychotic medications is an area identified as problematic. It was identified that some providers were "deferring assessments until next in-person visit," and others, unsure how to proceed, sought guidance in team meetings (K. Mccracken, personal communication, November 13, 2020). The use of standardized assessment tools such as the Abnormal Involuntary Movement Scale (AIMS) are most commonly conducted in-person requiring hands-on physical assessment and serve as an instrument for early detection and long-term monitoring for medication-induced movement disorders (Munetz and Benjamin, 1988), which creates the problem of *how* to conduct standardized assessments such as the AIMS within the telepsych setting for VA providers.

Without consistent monitoring of movement disorders at prescribed intervals utilizing standardized scales such as the AIMS, the ability for early detection, prevention, and treatment of drug induced movement disorders including akathisia, dystonia, Parkinsonism, and tardive dyskinesia (TD) due to antipsychotic medications puts Veterans at risk for permanent harm. One study conducted by Tenback (2006) and colleagues exemplified this assertion. In their study, nearly 10,000 patients participating in the European Schizophrenia Outpatient Health Outcomes (SOHO) study, early detection of extrapyramidal symptoms (EPS) was associated with higher risk for development of TD (Tenback et al., 2006). Given that TD has typically shown irreversible outcome for most patients (Vinuela and Jung Kang, 2014; Correll et al., 2017), early detection and management of drug-induced movement disorders, as Tenback et al. (2006) suggest, can improve the health outcomes of our veterans.

Clearly stated, the problem of focus within the VA Outpatient Mental Health Clinic is that providers are deferring AIMS do to converting to the telepsychiatry setting and are unsure about how to conduct the assessment in this setting. Deferring the AIMS puts Veterans at risk for newly emerging or worsening of movement disorders.

Available Knowledge

As a result of the novel COVID-19 pandemic, the Veterans Health Administration (VHA) has developed a response and operations plan to ensure that the health and wellbeing of Veterans, their families, and the VA workforce will be maintained (VHA, 2020). Within the VHA's response plan, they have identified specific mission statements that have directed the actions concerning the delivery of care to ensure safety and limit the spread of COVID-19; two of these being: (1) limit the spread of COVID-19 to Veterans and staff and (2) provide continuity of care for Veterans not infected (VHA, 2020).

To achieve these mission statements, the VHA has recommended that all clinics attempt to move towards an "all telehealth" mode utilizing phone, video, or electronic communication, which has brought us to the VA outpatient mental health clinic's current operational mode and where transitioning to telehealth has created both benefits (e.g., access to care) and new challenges (e.g., practice and technological implications) to explore and overcome (Koonin et al. 2020; Romanick-Schmiedl and Raghu, 2020; Lu et al., 2020).

One challenge that is currently being addressed at both local and national level is best-practice surrounding the assessment of movement disorders given the shift to telehealth for many providers. A study conducted by Dr. Amarendran (2011) and colleagues suggest that neuropsychiatric assessment—including the AIMS—can be equally as effective via video as in-person (Amarendran et al., 2011). Additionally, there are cases of expert opinion and world organizations that suggest video assessments for movement disorders can be effective with good clinical judgement (e.g., stratifying risk factors to determine need for in-person visits) surrounding risk stratification and slight modification to the given standardized assessment (Jain, 2020; Hoberg, 2020).

The AIMS is a standardized assessment tool used to assess for medication-induced movement disorders that is recognized by American Psychiatric Association (APA) and recommends a baseline test "—at a minimum of every 6 months in patients at high risk—" and at least every 12 months in other patients or if new or exacerbation of preexisting movements are detected (APA, 2020).

The AIMS is a 12-item test that is typically done in-person and requires patients to follow verbalized instruction and physical assessment by the examiner conducting the assessment (Munetz and Benjamin, 1988). However, one study conducted by Amarendran et al. (2011) omitted the physical assessment requirements (e.g., procedure number nine, asking the examiner to check arms for muscle rigidity). Their finding produced significantly significant result indicating that the assessment was equally effective compared to traditional administration of the AIMS assessment (Amarendran et al., 2011).

A recent study conducted by Misgana et al. (2020) provide evidence to support rates of drug-induced movement disorders in over 40 percent of patients taking antipsychotic medications. Specific movement disorder prevalence in Misgana et al. (2020) was sustained by a previous Clinical Antipsychotic Trials of Intervention Effectiveness (CATIE) schizophrenia trial (Caroff et al., 2011). In both studies, similar ranges of prevalence were reported, these being: dystonia, 3.4 percent; drug-induced Parkinsonisms, 27.3 percent—closer to results from first-generation versus second-generation antipsychotics in Caroff et al. (2011); akathisia, 21.1 percent; TD, 9.5 percent—more in keeping with second-generation antipsychotics from Caroff et al. (2011).

Several factors exist that increase risk for medication-induced movement disorders. There is evidence that suggest older age, duration of antipsychotic use, and higher dosages of medication increase risk (Correll et al., 2017; Ward and Citrome, 2018; Caroff et al., 2011). Other risk factors of note include female sex, African American ethnicity, preexisting mood disorders, diabetes, HIV positive, cognitive disturbance, and the use of Antiparkinsonian medications, and concurrent lithium and antipsychotic use (Correll et al., 2017). With respect to risk factors and the population served by the Department of Veteran Affairs, it is important to keep in mind that Veterans served are typically older—over half of the population served within the VA healthcare system are over the age of 65—and in general less healthy

than the comparative US population, possibly raising the risk in this population compared to others (Farmer et al., 2016).

Rationale

In light of the most current COVID-19 pandemic, several hypotheses as to why assessments such as the AIMS have not been consistently implemented into practice were made. (1) Sudden or numerous changes from institution to providers, (2) a lack of research available to inform best practice for situations such as medication induced movement disorder assessments via video, and (3) the technological barriers that providers and patients face (e.g., availability of video equipment and knowledge in use of different video platforms).

When considering the recency of adapting to telemedicine for many VA patients and providers, working through technological issues have created barriers to delivering quality care. Examples of this can range from intermittent video and audio to poor lighting that can result in missing key clinical signs or symptoms of pathology (Cubo and Mari, 2020). Other examples are not having access to devices capable of video or lack of knowhow in utilizing different technology for the patients, which can create a potential problem of equitable care.

In addition to technological issues, there is no unified stance about administering the AIMS assessment. Educating providers about what is known and recommendation about *how* to conduct AIMS might increase the likelihood of adopting these recommendations into their practice. The assumption that an educational intervention would be successful was based off the information in conversations between providers and lack of guidance or knowhow as mentioned earlier (K. McCracken, personal communication, November 13, 2020).

Given the hypothesized reasons for AIMS not being consistently implemented and practiced, the RE-AIM (Reach, Efficacy, Adoption, Implementation, Maintenance) was a logical theoretical approach to systematically guide the implementation of best practice for this project within the VA Outpatient Mental Health Clinic and the larger Veterans Healthcare system.

The RE-AIM framework for quality improvement utilizes dimensions for planning and evaluation at both the individual and organizational level. At the individual level, Reach—R, looks to analyze proportions of the target population that participate in the intervention and Efficacy—E, success rate of the planned intervention. At the organizational level, Adoption—A, the number of participants who received the intervention adopting into current practice and Implementation—I, how the intervention is being implemented as intended in practice. Maintenance—M, is a combination of the individual and organizational level that monitors efficacy of the intervention change over time (Milat and Li, 2017).

Specific Aims

(1) To increase VA Outpatient Mental Health Clinic provider confidence by two points in conducting the AIMS assessment via video utilizing a Likert scale of confidence within three months of intervention.

(2) To increase VA Outpatient Mental Health Clinic provider compliance with concern to recommended time intervals by two points in conducting the AIMS assessment via video utilizing a Likert scale of confidence within three months of intervention.

Methods

Context

The VA Outpatient Mental Health Clinic is a network of mental health providers consisting of nurse practitioner, psychiatrist, psychologist, and Licensed Clinical Social Workers (LCSW) charged with treating Veteran's mental health throughout Oregon. Within the VA Outpatient Mental Health Clinic, there are roughly 18 Psychiatric Mental health Nurse Practitioners (PMHNPs) that were recruited to participate in the study. This clinic is one part of the larger Veteran Health Administration (VHA), which is the largest health system in the US. The VHA is responsible for the delivery of healthcare to over 8-million veterans in over 1700 sites across all 50 states and employs nearly 55,000 clinicians (Farmer et al., 2016).

Intervention

A power-point was distributed one week prior to the educational intervention via email. Within the email, a brief synopsis as to the purpose of the education intervention was explained to the PMHNPs. The educational intervention was conducted in a one-hour session during the PMHNP monthly meeting via video conference. The training consisted of a general overview of (1) drug-induced movement disorders, (2) patients risk stratification of movement disorders, (3) an overview of the AIMS adaptions to telepsychiatry demonstration of proper video angles and lighting, a demonstration of the AIMS being performed via video, and (4) general information about telehealth best practices for the provider and patients. At the end of the training session, 20-minutes was allocated for questions and concerns about the education provided. Additionally, open dialogue concerning the difficulties providers were having with maintaining minimum standards for assessing medication induced movement disorders as well as personal successes and failures around this issue was discussed.

Study of the Intervention

To assess primary measures, analysis using a Likert scale of agreeability was conducted via Survey Monkey to determine differences post intervention in (1) provider confidence about conducting an AIMS assessment and (2) compliance with respect to minimum duration of time recommendation between AIMS assessments. To measure the impact of the educational intervention for the VA outpatient mental health clinic PMHNPs, pre- and post-intervention surveys were administered. A secondary measure also utilizing a Likert scale of agreeability was conducted to determine whether changes in practice around assessing for medication induced movement disorders was related in general to the COVID-19 pandemic.

Measures

Outcome measures included pre- and post-intervention surveys. To determine confidence in conducting the AIMS, the following statement was given. *"I am comfortable conducting an AIMS assessment utilizing video technology."* To determine compliance with duration of time between AIMS assessments, the statement, *"In my current practice, the VA guidelines concerning the minimum duration of time between AIMS assessments is being followed"* was given. To determine the potential impact on

assessing for medication induced movement disorder due to COVID-19 related changes the statement, *"since transitioning to a predominantly Telehealth model due to the COVID-19 pandemic, my ability to assess veterans at risk for movement disorders has been negatively affected"* was asked to participants.

The number of participants in the project were anticipated to be low and as a result it was determined that statistical significance could not be achieved. Given this, measuring mean score differences from the Likert scales for both questions and analyzing for trends was determined to be the best method to not over or understate effects of the educational intervention.

The process measure included evaluating the attendance of the 18 Psychiatric Mental Health Nurse Practitioners (PMHNP) within the VA Outpatient Mental Health Clinic during the intervention. This provided information about the proportion of the intended audience that participated. In all, 11 of the 18 PMHNPs attended and it was determined by leadership that a significant proportion of PMHNPs attended, thus a second educational intervention was not required.

With concern to balancing measures, the VA Outpatient Mental Health Clinic PMHNPs attend an established monthly meeting. By utilizing the established monthly meeting, the likelihood of maximum participation with no additional cost incurred by the VA medical center was high. Enough time was allotted to ensure that at least two educational interventions could be administered with enough time to attain 3-month post-intervention results.

To ensure completeness and accuracy of data, a Microsoft Excel spread sheet was utilized. Additionally, all data was double checked with information gathered through Survey Monkey containing the original data to ensure accuracy.

Analysis

A comparison of pre-intervention respondent's (N = 11) scores showed a positive trend in mean confidence of performing the AIMS assessment before and after the educational intervention. This indicates that the mean confidence score after the AIMS education (M= 5.60) was higher than the mean before the education (M = 4.45).

A comparison of post-intervention respondent's (N = 5) scores showed a positive trend in mean for the number of providers conducting AIMS assessments recommended time frame from pre- to post-educational intervention. This indicates that PMHNPs who conducted the AIMS in accordance to VHA recommended time intervals after the AIMS education (*M*= 5.60) was higher than the mean before the education (*M* = 4.72).

The secondary measure—attributing the impact of COVID-19 to negatively affecting PMHNPs ability to perform for medication induced movement disorder—provided clear evidence as to the impact of COVID-19. Of the 11 respondents, 10 indicated at least somewhat of an impact and 8 of which agreed or strongly agreed as to COVID-19 negative impact.

Ethical Considerations

The current study was reviewed by the VA Medical Center's Internal Review Board (IRB) and deemed involved "minimal-risk" to participants within the study. All participants are PMHNPs from the VA Outpatient Mental Health Clinic where informed consent was given as to the nature of the current study and participation was volunteer.

Results

Throughout the time of this improvement project, more than half (11 of 18) of the PMHNPs working within the VA mental health department were provided education about utilizing the AIMS in a telehealth format. Through consultation with leadership, it was determined that this was an adequate number for attendance and a second educational intervention was not needed.

Results concerning the effectiveness of training were not statistically significant; however, a positive trend was seen in both confidence and compliance in meeting minimum time standards between assessments (*figure 1*). The specific goals for mean scores improving by two points using the 7-point Likert scale was not achieved, however, modest improvements—roughly one point—for both primary outcome measures were seen. In retrospect, allowing for open responses would have been useful for determining usefulness of content within the teaching material and would have aided in the next iteration of a Plan-Do-Study-Act (PDSA) cycle.

One critical process measure was unintentionally omitted and discovered throughout the improvement project process. The number of respondents' post-intervention (N = 5), compared to pre-intervention (N = 11) did not provide adequate enough data to make meaningful inferences about the education intervention, which made it impossible to draw a correlation between the intervention and improvements seen in the Likert scores.

Discussion

In the time spent working at the VA outpatient mental health clinic the COVID-19 pandemic has resulted in significant changes impacting the delivery of care and how care is being delivered by providers on a global scale. For example, a recent article published by the US Department of Health and Human Services (2021) cited an estimated 40-percent decrease in emergency department visits and a mass transition from in-person to telehealth visits since the start of the pandemic.

Specific to the VA outpatient mental health clinic, this major transition to telehealth visits created a situation putting Veterans at risk for medication induced movement disorders. This was due to a lack of knowledge and resources about *how* to perform AIMS assessments in a telehealth setting, which was both formally and informally identified via team meetings and surveying PMHNPs. In response to these findings, an education intervention was implemented, which resulted in improvements of reported confidence in performing an AIMS assessment by video and compliance in recommended time between AIMS assessments by approximately one-point pre- versus post-intervention mean scores for the PMHNP participants. Though the design of the intervention and study results were not able to achieve statistical significance, the positive trends observed in pre- and post-intervention surveys are positive first steps in understanding and improving providers ability to assess for medication induced movement disorders.

Interpretation

Upon completing the educational intervention, results indicated a positive trend in the number of PMHNPs that felt more confident in conducting an AIMS assessment via telehealth. In one study conducted by Davis et al. (1999) evidence supports the use of "interactive [continuing medical education] CME sessions" which the authors described as education that enhances providers activity and the ability

to practice skills. The results of their study indicate that interactive CME sessions can "effect change in professional practice and, on occasion, health care outcomes." The intervention for this improvement project did meet the authors criteria for interactive CME session. Given this evidence along with the trends observed there would be reason to believe this was a meaningful intervention.

In addition, feedback from several staff members indicated that the educational intervention was needed and of benefit to their own practice. However, there was still some concern about video technology using the VA Video Connect VVC. Mostly concerns about picture quality and connectivity issues were brought up, which has made it difficult for some VA providers and Veterans to communicate via video. Given this situation, a larger problem might first need to be addressed in updating system wide video technology to eliminate or control this barrier, which could improve the video experience for both Veterans and their providers.

Limitations

This study had several limitations. Within the VA Outpatient Mental Health clinic, there are other medical providers (e.g., MDs and Psychologists) that interact with Veterans on a day-to-day basis that can also assess for movement disorders that were not captured in the intervention group. Given this, it is unclear whether the intervention was implemented in a way that change could be observed clinic wide. Additionally, within the VA's electronic medical records system, there are clinical reminders that display to leadership when a task is overdue (e.g., AIMS assessment overdue creates a flag). The logistics around coordinating with the clinical analytics team at the site of my project was unsuccessful as time did not permit; however, understanding that such data is available could steer next steps of the project. Have flags around the AIMS assessment being overdue gone down since the educational intervention? Having access to these systems might be useful in identifying statistically significant results that can be correlated directly to future interventions, which was not the case for this study.

Conclusion

The current project found that a lack of knowledge around PMHNPs at the VA outpatient mental health facility did exist. Providing continuing education to the PMHNPs showed trends of improvement

in confidence of conducting the AIMS assessment via video format and compliance with concern to recommended time intervals between assessments.

As the medical model shifts towards more telemedicine, the importance of continuing education with concern to adapting assessment will become increasingly needed. Assessing for medication-induced movement disorders utilizing the AIMS assessment is only one example highlighting the gaps in knowledge surrounding the large issue of transitioning to a telemedicine model of care. Continuing education will be essential in sustaining a provider workforce that is well prepared and equipped to meet these changing times to ensure quality care to those we serve.

Given the sudden shift to telemedicine, next steps should include more research to ensure that assessments such as the AIMS are equally reliable and effective in detection and prevention of disease as in-person application. Without adequate research, we have to rely on expert opinion—which does have value—however, evidence-based practice is the ultimate goal and standard that ensures the best health outcomes.

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Appendix

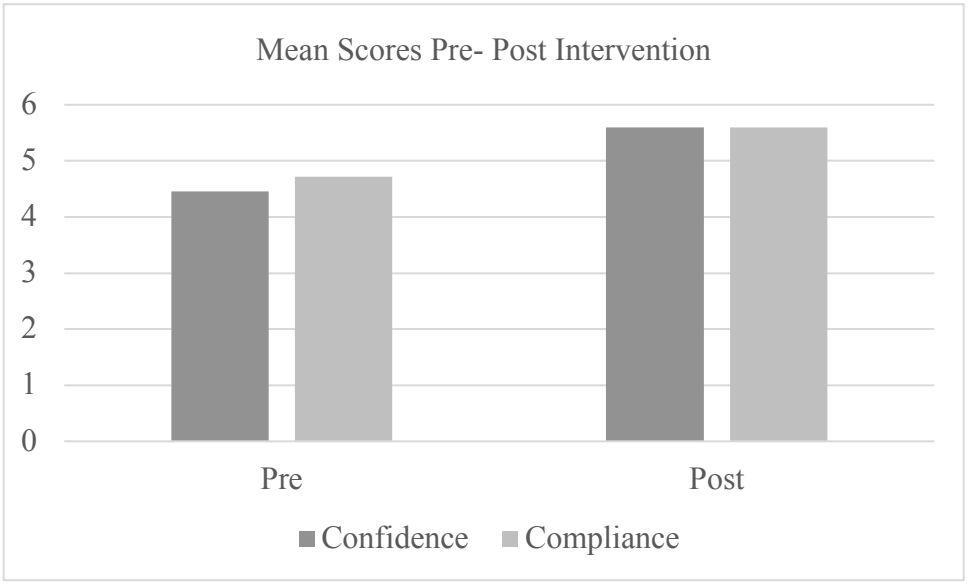

Figure 1