BRIEF REPORT

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Exploring Antidepressant Adherence at a Student-Run Free Mental Health Clinic

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Abstract

Minority groups experience higher depression but lower treatment rates. Student-run free mental health (MH) clinics, such as the East Harlem Health Outreach Partnership (EHHOP) MH clinic, address this disparity. This study scrutinized EHHOP MH's depression treatment by measuring adherence to antidepressants. Pharmacy data from seventy-nine patients were reviewed according to HEDIS criteria. Results compare EHHOP MH to New York State (NYS) Medicaid and NYS commercial insurance providers. In the acute treatment phase, EHHOP MH performed similarly to NYS Medicaid. In all other comparisons, EHHOP MH had lower adherence rates. Physician notes were reviewed to identify reasons for low adherence.

Keywords Antidepressant adherence · Student-run clinic · HEDIS criteria · Free clinic · Mental health clinic

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Introduction

In the United States, ~ 10% of adults meet criteria for a mood disorder such as major depression (Kessler et al. 2005), and antidepressants have become an increasingly popular choice for treatment (Olfson and Marcus 2009). For antidepressants to be efficacious, patients must remain adherent until symptoms remit, up to 12 weeks (Posternak et al. 2011; Rush 2007). To decrease the risk of relapse, treatment should be continued for 4–9 months (Gelenberg et al. 2010). About three-quarters of Americans receive their antidepressant prescriptions from primary care (PC) settings. Unfortunately, adherence to treatment is lower in PC clinics compared to MH settings (Rossom et al. 2016; Vuorilehto et al. 2016), with more patients likely to discontinue antidepressants within 30 days (Mojtabai and Olfson 2008). Several factors are associated with poorer mental health (MH) outcomes, including being male, black, less educated, or at the extremes of age (Mays et al. 2018; Young et al. 2001). Although non-white ethnic groups and persons without health insurance are more likely to meet criteria for major depression (Control and Prevention 2010), the increased use of antidepressants has neither been reflected in minority groups nor in uninsured individuals (Chen et al. 2018; Olfson and Marcus 2009), possibly due to under-utilization of mental health services, which is a well-documented phenomenon among Latinx populations (Barrera and Longoria 2018). Additionally, studies have reported lower treatment

adherence for major depression in non-white patients (Rivero-Santana et al. 2013; Zivin et al. 2009). Taken together, uninsured minority groups are a vulnerable population who often receive sub-optimal MH care in the PC setting, and adherence to antidepressant medication is a particular concern.

The current study asks the question: would establishing a dedicated MH clinic within a vulnerable community improve the treatment of depressive disorders via improved adherence? This question is examined within a student-run, attending-supervised free MH clinic that serves a community of uninsured individuals, most of whom are ethnic minorities. Antidepressant adherence was previously assessed by Liberman et al. (2011) in the PC arm of the same student-run clinic; in this prior study, adherence rates were compared to those of New York State (NYS) Medicaid and commercially available insurance plans. Since that study, an ancillary MH clinic has been established within the student-run center. Patients who require specialty care are referred from the PC clinic to the MH clinic for psychiatric medication management and supportive counseling. The MH clinic's model is distinct from the PC clinic. Unlike in the PC clinic, all patients in the MH clinic have a single student provider whom they see at each visit. All visits are overseen by a senior psychiatry resident and attending. This follow-up study will re-assess antidepressant medication adherence within the MH clinic and compare results to rates previously reported by the PC clinic and to those reported NYS Medicaid and commercially available insurance companies. Because the MH clinic provides targeted psychiatric care, it is hypothesized that adherence rates will exceed those previously reported by the PC clinic.

Methods

Student-run clinics aim to decrease healthcare disparities in communities with unmet needs and are increasing in number, with over 200 in operation across the United States (Smith et al. 2014). Several studies have demonstrated that they perform at or above industry standards (Kramer et al. 2015; Ryskina et al. 2009; Taylor et al. 2015). The East Harlem Health Outreach Partnership (EHHOP) is a student-run, attending-supervised free clinic open on Saturdays that is associated with the Icahn School of Medicine at Mount Sinai. Since its inception in 2004, EHHOP has provided comprehensive PC and medications at no out-of-pocket cost to uninsured adults 22 years of age or older residing in East Harlem, New York City (NYC). Today, EHHOP also includes an ancillary MH clinic which offers supportive counseling and psychiatric medications. EHHOP does not have an on-site pharmacy; patients pick up their

prescriptions from an offsite, hospital-associated employee pharmacy.

The East Harlem neighborhood is composed mostly of non-white populations with 50% of persons classifying themselves as Hispanic and 31% as black. One-third of East Harlem residents live in poverty (NYCHealth 2015) and, despite the initiation of the Affordable Care Act, the proportion of uninsured in East Harlem remains at nearly double the Manhattan average (NYCHealth 2015). This is likely because healthcare reform has little impact on communities where many individuals are undocumented, barring them from public insurance.

Treatment of clinical depression was assessed using quality measures for antidepressant medication management set by the National Committee for Quality Assurance (NCQA) Healthcare Effectiveness Data and Information Set (HEDIS®). These widely accepted, scientifically based measures were selected because they are used to evaluate Medicaid and commercial health plans in NYS. Antidepressant medication is recommended for patients with a diagnosis of major depression, which should be titrated appropriately in the acute phase of treatment (3 months or until remission), and continued for at least 6 months to prevent relapse, termed the continuation phase of treatment (Davidson 2010).

In order to evaluate EHHOP MH's clinic population, several HEDIS measures were adapted. HEDIS criteria only include patients with a documented diagnosis of major depression. A significant number of EHHOP MH patients with depressive symptoms were diagnosed with adjustment disorder, dysthymia, or depressive disorder NOS, which were included to increase power. Further, HEDIS measures require a 105-day medication washout criteria before inclusion; because medication adherence was determined by looking exclusively at the dispensing data from EHHOP's associated pharmacy, it was not known if a patient was receiving an antidepressant from an outside pharmacy before initiating treatment with EHHOP.

The Icahn School of Medicine at Mount Sinai Internal Review Board (IRB) granted this retrospective chart review a Waiver of Authorization for use and disclosure of protected health information. Querying the Mount Sinai hospital record system for all patient encounters with the EHHOP MH clinic returned 658 encounters with 119 patients from March 2009 through July 2016. Patients who met the following two criteria were included in the chart review: documentation of clinical depression and initiation of an antidepressant medication in either the EHHOP MH or PC clinic. Patients who initiated treatment in the PC clinic were only included if their care was subsequently transferred to the MH clinic. Exclusion criteria were a primary diagnosis of an anxiety disorder or post-traumatic stress disorder (PTSD) or long-standing treatment with an antidepressant before being

seen by the EHHOP MH clinic. Pharmacy dispensing data was gathered for all MH clinic patients to determine the length of any gaps in medication treatment. Antidepressant medications included were selective-serotonin reuptake inhibitors (SSRIs), serotonin–norepinephrine reuptake inhibitor (SNRIs), and atypical antidepressants including bupropion and mirtazapine.

Chi square tests were used to compare the rates of effective medication management at EHHOP's MH clinic to findings by Liberman et al. (2011) and 2014 Medicaid, Commercial HMO, and Commercial PPO rates in NYS, which was obtained from the NYS Department of Health. Results were corrected for continuity using Yates correction for continuity. The analyses were set with one degree of freedom, with an α-value of 0.05.

Participants' charts were reviewed at 3 and 6 months following their initial visits to better understand medication adherence. Adherence was categorized as non-adherent (patient reported taking none of the medication), partial adherence (patient reported missing some doses or taking the medication not as prescribed), full adherence (patient reported complete compliance), or indeterminate (no information in chart about medication adherence). Reasons for non-adherence were categorized as ran out of medication, stopped after improvement, ambivalence toward medication, difficulty with obtaining medication at the pharmacy, side effects, misunderstanding dosing, patient was not interested in treatment, or indeterminate/other. Based on the provider's assessment of the patient, treatment response was categorized as full response, partial response, no response, or recurrence.

The association of treatment response and adherence at 3 months to treatment response and adherence at 6 months was investigated. Chi square analyses were used to examine associations between these variables, with an α-value of 0.05. Adjusted standardized residuals were used to explore significant Chi square tests to determine which comparisons were the source of significance, with residual values > 1.96 considered meaningful.

Results

A total of 79 EHHOP MH clinic encounters met inclusion criteria for the study. 71% of EHHOP MH patients identified as Hispanic, compared to 82% of EHHOP PC comparison group (Liberman et al. 2011) and 19% of patients enrolled in NYS Medicaid (2014). Other demographic data, including gender and age, was largely similar between EHHOP MH and PC. Because NYS Medicaid includes patients under the age of 18 (38% of total enrollment), they are a younger cohort than EHHOP patients, who are required to be 22 years of age or older. Additionally, 55% of NYS Medicaid

patients were female, compared to 75 and 78% of EHHOP MH and PC patients, respectively. Demographic data was not available for NYS commercially insured patients.

Dispensing data showed that 39 and 24% of the MH clinic patients were adherent to antidepressant treatment in the acute (3 months) and continuation (6 months) phases of treatment, respectively. This compares to 83 and 50% of EHHOP PC clinic patients, 64 an 48% of NYS HMO patients, 69 and 55% of NYS PPO patients, and 50 and 35% of NYS Medicaid patients. There was no significant difference between acute treatment adherence in EHHOP MH clinic and NYS Medicaid. However, the MH clinic's acute adherence rates were significantly lower than EHHOP PC, $X^2 (1) = 9.81$, $p = 0.002$, as well as private insurance companies, HMO $X^2 (1) = 20.23$, $p < 0.001$, PPO $X^2 (1) = 29.78$, $p < 0.001$. There was no significant difference in continuation adherence rates between EHHOP MH and the PC clinic. The MH clinic's continuation adherence rates were significantly lower than NYS Medicaid, $X^2 (1) = 3.88$, $p = 0.049$, and private insurance companies, HMO $X^2 (1) = 17.01$, $p < 0.001$, PPO $X^2 (1) = 27.84$, $p < 0.001$.

Sixty-six charts were reviewed to provide a better understanding of non-adherence. Among patients who had appointments at the MH clinic, 69% were adherent at 3 months and 53% at 6 months. This demonstrates substantially better adherence among patients who attended their appointments. However, because patients typically renew their prescriptions at appointments, we assumed that the 18 patients at 3 months and 28 patients at 6 months who did not have appointments were non-adherent, dropping adherence rates to 50% at 3 months and 30% at 6 months. At 3 months, the most frequent patient-reported reasons for non-adherence included running out of medication (33%), stopping after perceived improvement (13%), side effects (13%), misunderstanding dosing (13%), and losing interest in treatment (13%). At 6 months, the top reasons included running out of medication (28%), stopping after perceived improvement (17%), misunderstanding dosing (17%), side effects (11%), and unknown reasons (11%).

In examining associations between treatment response and adherence, there was a significant association between treatment response at 3 and 6 months, $X^2 (4) = 10.25$, $p = 0.036$. Adjusted standardized residuals demonstrated that full/partial responders at 3 months were more likely to continue to have a full/partial response at 6 months and were less likely to have no appointment at 6 months; patients with no response at 6 months were less likely to have a partial/full response at 6 months, and patients with no appointment at 3 months were less likely to have a partial/full response at 6 months. There was also a significant association between adherence at 3 and 6 months, $X^2 (4) = 10.10$, $p = 0.039$. Adjusted standardized residuals demonstrated that patients that were adherent/partially adherent at 3 months were more

likely to be adherent/partially adherent at 6 months and were less likely to not have an appointment at 6 months, while non-adherent patients at 3 months were more likely to be non-adherent at 6 months and were less likely to become adherent/partially adherent. There was no significant association between adherence at 3 months and response to treatment at 6 months, nor between response to treatment at 3 months and adherence at 6 months.

Discussion

The aim of this study was to assess the quality of treatment of clinical depression at a student-run MH clinic that provides services free of charge to a population of uninsured individuals. The quality measures were based on HEDIS criteria, which examine antidepressant adherence at 3 and 6 months. These results were compared to a prior HEDIS criteria-based study (Liberman et al. 2011) conducted at the clinic's PC clinic before the dedicated MH clinic was opened, as well as to NYS Medicaid and private insurances companies. Although we hypothesized that antidepressant medication adherence rates in the dedicated MH clinic would be higher than in the PC arm of EHHOP, our data suggests otherwise.

The lower adherence rates in the acute phase of treatment in the EHHOP MH clinic (39%) compared to those previously reported by the EHHOP PC clinic (83%) could be partly explained by study design variations. In the PC study, adherence was only investigated in 18 patients. Also, in contrast to evaluating pharmacy fill data, the prior study assumed that all written prescriptions were dispensed, likely leading to an overestimation of adherence. The current study's application of a more rigorous methodology corroborated with a comprehensive chart review with a larger sample size likely generated a more accurate account of medication adherence.

Methodological differences aside, missed appointments and loss-to-follow-up were significant in the MH clinic. Twenty-seven percent of patients did not have an appointment at 3 months after their index visit, which increased to 42% at 6 months. Among patients who attended follow-up MH appointments, however, adherence rates were comparable to NYS standards. While the current average weekly no-show rate between the MH and PC clinics is similar—18% at MH (unpublished quality improvement data) and 19% at PC (Mackenzie Naert et al. 2017)—the MH clinic schedules monthly appointments for medication renewal compared to bi or tri-yearly appointments for most PC clinic patients. This lower appointment burden may contribute to superior patient retention and adherence rates at the PC clinic.

Comparing current adherence rates to NYS Medicaid, the MH clinic is performing similarly in the acute phase

of treatment but underperforming in the continuation phase of treatment. Compared to commercial insurance providers, the MH clinic is underperforming in both domains. These results must be considered in the clinical context of this student-run free clinic. For example, there are significant demographic differences between EHHOP and NYS Medicaid—71% of EHHOP MH patients identified as Hispanic, compared to only 19% of NYS Medicaid patients. Because EHHOP provides services exclusively for individuals who do not have health insurance, in the era of expanded Medicaid and marketplace plans through the Affordable Care Act, the majority of patients seen are undocumented. The specific challenges faced by this population include low socioeconomic status, difficulty finding and maintaining employment, and non-stable housing, creating barriers to treatment adherence and maintaining continuity of care. In this way, lack of adherence to antidepressants is a symptom of the psychosocial stressors faced by this population. It is also important to consider that, as a student-run clinic, the EHHOP MH clinic relies on student clinicians supervised by senior residents and attending psychiatrists. It is possible that the clinic should provide enhanced training to its student clinicians and resident supervisors in order to match Medicaid/private insurance adherence rates.

Looking at associations between patient-reported adherence and treatment response, results demonstrate that adherent patients are more likely to remain adherent and patients with good treatment responses are more likely to continue to report improvement; the converse is true for non-adherent patients and those with poor treatment response. Interestingly, no association was found between treatment response at 3 months and adherence at 6 months, which suggests that early treatment response, either positive or negative, is not driving medication adherence at 6 months. Treatment adherence at 3 months was also not associated with positive treatment response at 6 months. However, we suspect that a larger sample size would likely have demonstrated an association, as findings trended in that direction; this is especially likely considering that literature demonstrates the importance of adherence for obtaining depression remission (Rossom et al. 2016).

Our clinic is looking to improve adherence through several strategies. The most common patient-reported reason for non-adherence at both 3 and 6 months was running out of medication. We intend to conduct qualitative interview to better understand why patients ran out of their medications and other barriers to antidepressant adherence. One possibility is that, at the time of this study, patients obtained their medications from a near-by pharmacy that is open during regular business hours. Because the MH clinic is exclusively open on Saturdays, patients must return to the hospital to obtain their medications during the week. Patients anecdotally reported that picking up prescriptions

is burdensome, which may account for non-adherence due to running out of medication. About 52% of student-run free clinics provide on-site dispensing of medications (Smith et al. 2014). Our clinic has already begun to follow this model and currently dispenses commonly prescribed SSRIs and other psychiatric medication free-of-charge, in-house. Preliminary data suggests this new practice may significantly improve adherence rates. The success of this new system, as well as results of the qualitative interviews, will be reported in a follow-up study.

A significant limitation of this study is that the EHHOP-associated pharmacy records were obtained directly from the pharmacy. Researchers estimated that 14% of the encounters demonstrated a discrepancy between pharmacy fill data physician notes, potentially due to upgrades in dispensing software tracking systems. This may have decreased the apparent rate of adherence and explain why adherence rates were significantly higher when patient charts were used to evaluate adherence. Dispensing to patients in clinic would simplify tracking adherence rates. The study also had a relatively small sample size and patients presented with a range of depressive disorders, including major depressive disorder, dysthymia, and mixed depression and anxiety disorders. The heterogeneity of patients' symptom severities may have influenced adherence rates; research has shown that less severely symptomatic patients are more likely to be non-adherent (Melartin et al. 2005). Additionally, because patients received supportive therapy at their appointments, it's possible that they felt that psychotherapy alone was sufficient. While this may lead to medication discontinuation, it is cannot be seen as a failure of MH management. Exploring the relationship between symptom severities and remission, attendance at supportive therapy sessions, and medication adherence is an area that requires further research.

Conclusion

The current study reports on the performance of a student-run free MH clinic's antidepressant treatment adherence. The results indicate that the clinic is underperforming compared to the center's PC site, as well as to statewide standards. Findings should be investigated to better understand the challenges faced by the clinic's patient population in order to design and implement system-wide strategies to improve patient retention and medication adherence. Such insights are applicable to other free and student-run MH clinics, as well as any MH clinic that serves highly vulnerable patient populations.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflicts of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent This study did not require informed consent, as it was granted IRB exemption.

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