Key Words: medication history, survey, pharmacy student, antidepressant, ambulatory care, medication safety, psychiatry

The Impact of Completing Medication Reconciliation and Depression Treatment History in an Outpatient Depression Clinic

By Sarah J. Choi, Roberta Storey, Sagar V. Parikh, Jolene R. Bostwick

ABSTRACT ~ ***Objectives**: To enhance depression care by improving medication information available prior to initial patient consultations.* ***Experimental Design and Sample**: Single-center, with intervention delivered to all new patient referrals at a tertiary care depression clinic. Trained pharmacy students utilizing a standard script prior to the first consultation visit conducted a medication review and depression treatment telephone assessment.* ***Results**: From 225 individuals contacted once by phone in the week prior to scheduled initial consultation, 141 (62.7%) were reached and 113 (50.2%) completed the full phone assessment. An average of 4–5 medication discrepancies were identified per respondent, of which one-third were considered potentially clinically significant and more than 96% of patients having at least one reported discrepancy. Individuals who completed the call were also more likely to attend the initial consultation. In the medical record, 55 of the 106 (51.9%) pharmacy notes were incorporated in the clinical assessment note. On survey, clinicians reported that access to the pharmacy note saved clinician time, with all prescribing clinicians indicating the pharmacy note significantly influenced subsequent medication recommendations.* ***Conclusions**: Telephone assessments conducted by pharmacy students prior to an initial depression clinic consultation was associated with higher consultation attendance, identified a large number of medication discrepancies, were successfully reviewed and received by clinicians, potentially saved clinician time, and influenced subsequent medication prescribing.* Psychopharmacology Bulletin. *2019;49(1):44–55.*

Choi and Storey, PharmD Candidates of 2020, University of Michigan. Parikh, MD, John F. Greden Professor of Depression and Clinical Neuroscience, Professor of Psychiatry, Professor of Health Management and Policy – School of Public Health, Associate Director, University of Michigan Comprehensive Depression Center; Bostwick, PharmD, BCPS, BCPP, Clinical Associate Professor and Associate Chair, Department of Clinical Pharmacy, and Clinical Pharmacist in Psychiatry, Michigan Medicine, University of Michigan.

To whom correspondence should be addressed: Jolene R. Bostwick, PharmD, BCPS, BCPP, 428 Church Street, Room 2568 NUB, University of Michigan College of Pharmacy, University of Michigan, Ann Arbor MI 48109-1065. Phone: (734)764-0810; Fax: (734)763-4480; E-mail: jkingsbu@med.umich.edu

Introduction

Medication reconciliation can reveal discrepancies between the medication list on a patient's electronic medical record (EMR) and what the patient reports. A systematic review of medication reconciliation studies demonstrated that up to 98% of patients had discrepancies identified.[1] In specialty clinics, more recent studies reveal at least one medication discrepancy in about 88% of the medication reconciliations completed at a cancer center;[2] similarly, the pilot study this research is based on found that 73.5% of patients who completed a student pharmacist-led medication reconciliation had at least one discrepancy.[3]

Reconciling medication discrepancies and updating a patient's medication list improves patient safety by preventing adverse drug events (ADEs), such as drug-drug interactions (DDIs) and other medication errors.[4,5] Medication reconciliation is a crucial tool for maintaining patient safety and preventing ADEs, as it is a National Patient Safety Goal established by the Joint Commission.[6,7]

Initiatives to incorporate medication reconciliation have been implemented in a variety of health care settings. However, few medication reconciliation initiatives have been conducted in outpatient depression clinics.[3,5,8] Further, studies have quantified the number of discrepancies, but there has been a lack of analysis of the clinical impact of medication reconciliation in ambulatory care settings.[4,7]

Similarly, gathering a psychiatric treatment history prior to new patients' appointments is vital to providing safe and effective drug therapy. When considering patients living with depression, at least 63% have treatment-resistant depression (TRD), which requires switching medications, adding a second antidepressant, or using additional augmentation therapy.[9] TRD is more likely to occur in cases of more severe depression, such as major depressive disorder, and a low starting dose of the initial antidepressant.[10] Each successive change in therapy leads to a lower rate of remission;[11] therefore, knowing an individual's treatment history is vital for making well-informed clinical decisions.

This study analyzed the impact of a student pharmacist led medication reconciliation and depression treatment history initiative for new patients seen at an outpatient depression clinic associated with a large academic medical center. This study has been improved from the pilot[3] by including a classification system based on the data gathered from the medication reconciliation, expanding the depression treatment history to include adjunctive agents, and surveying clinicians about the usefulness of treatment histories.

By completing medication reconciliation and depression treatment history for new patients prior to their depression clinic appointments,

it was hypothesized that the majority of the patients would be classified (based on discrepancies) as potentially clinically significant, the gathered information would save providers time during the consultation, aid in medication selection, and patients who were reached by phone prior to their visit would be more likely to complete their clinic consultation appointment. Overall, this will enhance depression care and improve the initial patient consultation.

Materials and Methods

This study was expanded and improved from the pilot study[3] and was determined to be exempt and not regulated by the University of Michigan's Institutional Review Board. From January 1, 2018 to June 30, 2018, all new patients seen by the University of Michigan Depression Clinic providers were contacted by phone by a trained pharmacy student utilizing a standard script. This pharmacy phone interview typically occurred 1 week, but no more than 2 weeks, prior to the patient's scheduled consultation.

A detailed list of current medications for all conditions was obtained, along with systematic questioning for prior medication treatment of depression. Students first discussed the patient's current medications, including prescription medications, over-the-counter products, vitamins, minerals, and dietary/herbal supplements. The second portion of the call focused on the patient's treatment history, specifically antidepressant medications and other adjunct medications, including typical and atypical antipsychotics, mood stabilizers, stimulants, and benzodiazepines. Patients were asked about duration of treatment, medication response, tolerability, and the main reason for discontinuation. Patients' current psychiatric medications were also included in the treatment history portion of the call.

Following the call, pharmacy students documented the details of the encounter into the patient's EMR using a template to create a "pharmacy note." A DDI screen was completed as part of the workflow. The pharmacy students routed the pharmacy note to the psychiatric clinical pharmacist for review, editing, and signing. The note was subsequently routed to the patient's provider for review prior to the scheduled consultation appointment.

While patients were scheduled with the pharmacy team for these phone interviews, patients were not always available to complete the interview. If the patient answered the call but was not able to complete the medication reconciliation or the depression treatment history, the student attempted to reschedule the interview for later that same

day if possible. For patients who did not answer the call, a second call was attempted that day.

To analyze the medication reconciliation data, the following elements were used to classify the patients into one of four categories (none, minor, moderate, and potentially significant): (1) the number of discrepancies (deletions, additions, and dose/frequency changes), (2) whether the changes included a psychiatric medication, and (3) whether there were any new clinically significant DDIs. If no changes were made to the patient's profile after the phone interview, the patient was classified into the "none" category. If the patient's medication reconciliation resulted in five or fewer discrepancies and did not include a psychiatric medication, then they were classified into the minor category. If there were at least six discrepancies, if the discrepancies included a psychiatric medication, or if the discrepancies revealed a newly recognized clinically significant DDI, the patient was classified into the moderate category. If the patient's medication reconciliation had two or more of the criteria used for the moderate category, then the patient was classified into the potentially significant category.

For the antidepressant and adjunct treatment histories data, a trial was defined as adequate if the patient reported taking any given medication for a duration of two months or longer.[3] The patients were also asked what dose they had tried, but dose was not utilized to determine trial adequacy. Following completion of all initial data collection, a short survey was sent to all providers of the Depression Clinic in order to elucidate the value of the treatment histories. The survey assessed how much, if at all, the treatment histories saved time for the providers during the patient's consultation and whether these histories affected medication selection. Providers were also asked to document in their notes after a patient's consultation whether they referenced or used the pharmacy note sent to the provider by the clinical pharmacist prior to the patient's consultation. They could do this by either inserting a pre-made phrase created by the pharmacy team or using parts of the pharmacy note in their own documentation.

Results

In total, there were 225 patients who received phone calls for the medication reconciliation and depression treatment history prior to their appointments, of which 141 (62.7%) patients were reached and 113 (50.2%) patients were able to complete the entire interview. Six patients completed the medication reconciliation only, and 35 patients were able to confirm their appointment time and date but did not have time to complete any other portion of the call. For those patients who

were reached and able to complete both portions of the call (n = 113), approximately 69.0% were female. The average age of the reached patients was 41.8 (range: 18 to 72 years). All patients called were also new patient referrals to the Depression Clinic, and 17.7% of the patients did not have active medications listed in their EMR prior to the pharmacy phone interview. The duration of the interview phone calls ranged 3–67 minutes, with an average of 21.2 minutes.

Medication reconciliation data showed that on average, patients had 4.7 discrepancies (n = 113), which includes any deletions, additions, and dose changes of prescription medications, over-the-counter/nonprescription medications, and vitamins/herbal supplements. The average number of discrepancies for each medication category and each type of discrepancy can be found in Table 1.

Classification of patients based on the medication reconciliation data revealed 96.5% of patients had at least one discrepancy after completing the phone interview. After classification, 40.7% of the patients were placed in the minor category, 20.4% in the moderate category, and 35.4% in the potentially significant category (Table 2). Approximately 55.8% of patients had a clinically significant DDI found after a drug interaction screen, and there was an average of 1.6 clinically significant DDIs per patient. After medication reconciliation, 30 (26.5%) of the patients had newly recognized clinically significant DDIs with an average of 2.1 per patient. Twenty-one patients (18.6%) also expressed medication related concerns to the pharmacy students during the phone call.

For the depression treatment history portion, a general overview is provided here. The depression treatment history section resulted in 658

TABLE 1

Medication Reconciliation Data

Overall Data (n = 113)	
% of patients with changes to medication list in the EMR	96.5%
% of patients without active medications prior to the call	17.7%
Average # of psychiatric medications per patient after the call	1.7
Discrepancies noted in EMR	
Average # of discrepancies per patient	4.7 [0–15]
Discrepancies by type of change	
Average # of deletions	1.3 [0–8]
Average # of additions	2.7 [0–15]
Average # of dose changes	0.6 [0–7]
Discrepancies by medication type	
Average # of discrepancies involving prescriptions	2.5 [0–12]
Average # of discrepancies involving OTC/nonprescription meds	1.0 [0–5]
Average # of discrepancies involving vitamins/supplements	1.1 [0–10]

EMR, electronic medical record; OTC, over-the-counter.

TABLE 2

Drug-drug Interaction and Classification Data

Drug-Drug Interactions (DDIs) (n = 113)	
Average # of clinically significant DDI per patient determined after the call	1.6
% of patients with a clinically significant DDI determined after the call	55.8%
% of patients with newly recognized clinically significant DDIs	26.5% (30)
Average number of newly recognized clinically significant DDIs	2.1 (30)
Categorizing significance of newly gathered information (n = 113)	
% of patients classified NONE	3.5% (4)
% of patients classified MINOR	40.7% (46)
% of patients classified MODERATE	20.4% (23)
% of patients classified POTENTIALLY SIGNIFICANT	35.4% (40)

medication trials of various antidepressants and adjunctive agents among 113 patients (Table 3). Medication trials were categorized as adequate, inadequate, or unknown if the patient did not know how long they took a specific medication. Doses for past medication trials were not used to determine if the trial was adequate, as the vast majority of the patients did not remember what dose they had tried. The medication class with the overall highest percentage of adequate trials among all patients was monoamine oxidase inhibitors (MAOIs) at 83.3% (n = 6), followed by serotonin and norepinephrine reuptake inhibitors (SNRIs) at 72% (n = 75), and benzodiazepines at 64.4% (n = 101). Altogether, patients could not recall the duration of about one-fifth of the medication trials (22.3%, n = 658). The average number of trials per patient and average number of adequate trials per patient remains the highest for selective serotonin reuptake inhibitors (SSRIs) at 1.8 and 1.1, respectively. Furthermore, out of 113 patients who completed the phone interview in its entirety, 86.7% had tried at least one SSRI, followed by 74.3% having used adjunctive agents, such as antipsychotics, mood stabilizers, stimulants, or benzodiazepines. Over half of the patients, 56.6%, had also been exposed to "other" antidepressants, such as bupropion. Data on exposure to different medication classes are presented in Table 3.

The depression clinic appointment status for each patient in the time period was also retrospectively reviewed, and that data is presented in Table 4. This table displays how many patients completed, cancelled, or did not arrive at their clinic appointment without notifying the depression clinic of their absence beforehand (i.e., a 'no show'). The appointment completion rate demonstrated a positive correlation with reached patients, increasing from 76.2% to 91.5% for those patients who were reached by the pharmacy team 1–2 weeks prior to their clinic consultation (chi-square = 10.0993; df = 1; p = 0.001483). For patients who were

TABLE 3

Medication History Data (N = 113) [total trials = 658]

	NUMBER OF TRIALS	% OF ADEQUATE TRIALS (>2 MONTHS)	% OF INADEQUATE TRIALS (<2 MONTHS)	% OF UNKNOWN TRIALS	AVERAGE NUMBER OF TRIALS [RANGE PER PATIENT]	AVERAGE NUMBER OF ADEQUATE TRIALS	% PATIENTS EXPOSED TO EACH CLASS GROUPING
SSRIs	201	61.2% (123)	18.4% (37)	20.4% (41)	1.8 [0–7]	1.1	86.7% (98)
SNRIs	75	72.0% (54)	10.7% (3)	17.3% (13)	0.7 [0–4]	0.5	44.2% (50)
"Other" Antidepressants	89	56.2% (50)	16.9% (15)	27.0% (24)	0.8 [0–3]	0.4	56.6% (64)
TCAs	20	60.0% (12)	5.0% (1)	35.0% (7)	0.2 [0–3]	0.1	14.2% (16)
MAOIs	6	83.3% (5)	16.7% (1)	0% (0)	0.1 [0–2]	0.0	
Atypical Antipsychotics	64	57.8% (37)	21.9% (14)	20.3% (13)	0.6 [0–5]	0.3	74.3% (84)
Typical Antipsychotics	2	0% (0)	0% (0)	100% (2)	0.0 [0–1]	0	
Mood Stabilizers	61	50.1% (31)	19.7% (12)	29.5% (18)	0.5 [0–5]	0.3	
Stimulants	39	61.5% (24)	10.3% (4)	28.2% (11)	0.4 [0–3]	0.2	
Benzodiazepines	101	64.4% (65)	17.8% (18)	17.8% (18)	0.9 [0–5]	0.6	

SSRI, selective serotonin reuptake inhibitors; SNRI, serotonin norepinephrine reuptake inhibitors; "Other" antidepressants include bupropion, mirtazapine, nefazodone, and trazodone; TCA, tricyclic antidepressant; MAOI, monoamine oxidase inhibitors.

TABLE 4

Appointment Status

	REACHED PATIENTS (N = 141)	NOT REACHED PATIENTS (N = 84)	NOT ATTEMPTED PATIENTS (N = 35)
% Completed Clinic Appointment	91.5% (129)	76.2% (64)	91.4% (32)
% Not Completed Clinic Appointment			
% Cancelled Clinic Appointment	7.1% (10)	19.1% (16)	5.7% (2)
% No Show	1.4% (2)	4.8% (4)	2.9% (1)

not attempted (n = 35) due to last minute appointment bookings to fill cancelled appointment slots, 91.4% completed their appointments, 5.7% cancelled their appointments, and 2.9% were 'no shows.'

Retrospective review of the provider's documentation of their patients' appointments illustrated 51.9% (n = 106) of notes referenced the pharmacy note. Furthermore, the provider survey distributed five months after initiation of the pharmacy medication reconciliation and depression treatment history calls revealed that all the providers (n = 12), consisting of physicians, medical residents, nurse practitioners, and social workers, used the note prior to the patient's clinic appointment. In addition to most commonly using this information prior to the appointment, one provider used the note during the appointment, and four providers used it after the appointment. With regard to the utility of this information, the most common response was that the notes saved "a little amount of time," with prescribers (n = 6) more likely to indicate the notes saved them a moderate (n = 4) or large amount of time (n = 1) than non-prescribing providers (n = 6). The prescribing providers were also asked how often the pharmacy notes affected how they chose which medications to prescribe. Five answered "often," and one answered it "always" affected their choice in medication.

Discussion

Medication Reconciliation

With the majority of patients (96.5%) having had at least one change in their medication regimen, it is pertinent that pharmacy students are capturing these changes. Without a service similar to this, these discrepancies may or may not be remedied until the time of the patient's clinic appointment. When pharmacy students call patients to interview them prior to their clinic appointment, providers and patients are then able to invest time on other psychosocial aspects of therapy, allowing for

a deeper interaction, development of rapport, and an improved initial consultation and subsequent depression care.

The medication reconciliation completed by the pharmacy students also demonstrated about a quarter of the patients had newly recognized clinically significant DDIs identified in a screen completed after the phone interview based on the updated medication regimen, and the majority of the patients were classified into the moderate or the potentially significant groups. It is noteworthy that an average of 4.7 discrepancies were discovered for each patient and that most discrepancies involved a prescription medication. Additionally, the most likely change was an addition of a medication rather than a deletion or dose/frequency change. Thus reaching out to patients 1–2 weeks prior to their scheduled clinic appointment in order to gather the most current medication list is vital to patient safety and may prevent ADEs, although this study was not designed to evaluate these outcomes.

Depression Treatment History

The surveyed Depression Clinic's providers identified the medication reconciliation and depression treatment history to be markedly beneficial, as all twelve providers reported utilizing the pharmacy note. Beyond our survey results, about half of providers' notes contained a reference to the pharmacy note, indicating utility of this information. More specifically, documentation supporting provider use of the pharmacy note was associated with a change in provider workflow and behavior that is difficult to manage, but more easily changed when value is added from the provider perspective. Perhaps more telling, while a standard phrase for the providers was made to facilitate the addition of a reference to the pharmacy note in the provider's documentation, the request to do so was only presented once to the providers in person and then reinforced in weekly emails the depression team receives that convey more critical information about scheduled patients. In the future, increasing promotion and encouraging the providers to document their use of the pharmacy note would allow for the documentation records and the provider survey responses to better align.

These results reflect positive changes for enhanced quality of depression care. As previously mentioned, there is a statistically significant, positive correlation between patients who were reached (n = 141) and the clinic appointment completion rate. Increasing the appointment completion rate is imperative for improving patient care as well as clinic efficiency. It is possible to speculate that there is a correlation between the act of completing the pharmacy phone interview and later attending the clinic consultation appointment because patients would have

invested more time prior to the clinic appointment and therefore be less inclined to cancel or miss their appointment. While no causal association can be made, this finding may be of interest to clinic leadership and may demonstrate a positive effect of making these outreach calls.

The third category of patients were typically late additions to the depression clinic's schedule when another patient may have cancelled their appointment. The 'no show' and the cancellation rates were low for this group at 2.9% and 5.7%, respectively. This is not surprising given these patients are less likely to miss or cancel an appointment because they have been on a waiting list to be seen by the depression clinic. Overall, it was found that this pharmacy intervention supported the initial face-to-face consultation in the Depression Clinic with easy access to useful information at the point of care.

Limitations and Future Directions

One of the biggest obstacles faced in this study was reaching patients by phone, despite having the calls scheduled. Only about half of the patients the pharmacy students called were able to complete the call; the rest of the patients were not able to commit time to the interview or able to be reached for a variety of reasons. First, patients were told the entire phone call would take about 20–30 minutes (actual average was 21 minutes), which may have deterred patients from taking the time to talk to the pharmacy students. Investigating a way to streamline and shorten the interview may help increase a patient's likelihood of completing a call. For example, students may ask for fewer details about past medication trials the patients could not remember. Another way to adapt the workflow is to fine-tune the medication classes or limit past medication trials to a specified period of time (e.g., from the past two years) the pharmacy students inquired about.

Second, the timing of the pharmacy phone calls, which were made once a week in the middle of the day (10 am–3 pm), may have contributed to the poor response rate. Therefore, in the future, calling on different days and times should be explored. It was also identified that about one-third (36.8%; n = 106) of patients were not expecting these pharmacy phone calls when asked at the end of the call (an addition to workflow that was started following study initiation). It is possible that they were not expecting it because they might not have been scheduled or the patient may have forgotten the appointment. Further, appointments are made weeks and, at times, months in advance which would support this. To increase the reach and completion rate, an electronic form could be sent through the patient portal to patients who were not

reached or who could not complete the entire call to collect the same medication related data.

Some patients also had no active medications listed in their EMR before the pharmacy call, so it was not possible to compare medications from before and after the call. This slightly limits the implications of the medication reconciliation data, as these cases were counted as medication additions, which makes the results appear more favorable. With that said, however, the information was still important to obtain before patients' clinic visits and valuable as well as time saving from the clinician's perspective.

Another limitation of this study is the restrictions of referencing the note. Currently the notes are only available through the patient's profile as a single encounter, and there is no way to know how long providers may have looked at a pharmacy note as a quantitative measure of its utilization for the study. In the future, for ease of reference and expanding the usefulness of the initiative more broadly (i.e., across the health system), it may be wise to add the depression treatment history data to the patient's profile, such as a summary of all the psychiatric medications a patient has tried. This will make this information more readily accessible to various providers in the EMR.

For the depression treatment history portion of the call, as mentioned above, streamlining the process in order to reach more patients is vital. Another future direction that would offer valuable insight into past medication trials would be to add a timeline to the depression treatment history portion. This would give providers the knowledge of which medications were the patient's first line, second line, and so on, along with which medications may have been tried in combination, to provide a more comprehensive view of the patient's depression treatment history.

Conclusion

This study focused on performing medication reconciliations and depression treatment histories for all new patient referrals in a depression clinic. The results of this study demonstrate the following main outcomes: (1) an average of 4–5 discrepancies were identified per patient, of which a third were classified as potentially clinically significant, (2) the pharmacy note, especially the depression treatment history, saves the providers time and affects medication selection, and (3) patients who were reached were more likely to complete their clinic appointment. Overall, completing a medication reconciliation and collecting a depression treatment history is important for providing comprehensive,

high quality patient care and improving patient safety. These results indicate that a system of standardized medication and treatment phone assessment improved clinical service delivery and improved depression clinical care. ✤

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