



# Implementation of Pharmacist-led Telepsychiatry Services: Challenges and Opportunities in the Midst of COVID-19

Savera Arain<sup>1</sup> · Majed Al Shakori<sup>1</sup> · Shabeer Ali Thorakkattil<sup>1</sup> · Syed Iqbal Mohiuddin<sup>1</sup> · Fuad Al-Ghamdi<sup>1</sup>

Received: 8 February 2022 / Revised: 9 May 2022 / Accepted: 21 June 2022 / Published online: 26 July 2022  
© The Author(s), under exclusive licence to Springer Nature Switzerland AG 2022

## Abstract

Over the last few decades, healthcare systems worldwide have seen many transformations, and one of the most significant transformations is the adoption of telemedicine. Its rapid and wide adoption has created an entirely different set of healthcare experiences. The healthcare field has vastly benefited from integrating technology and patient care. Johns Hopkins Aramco Healthcare (JHAH) has implemented several telehealth models as a response measure to overcome challenges in access to patient care due to the COVID-19 pandemic. This article describes the implementation of pharmacist-led telepsychiatry services utilized to provide several psychiatric services such as counseling patients, ensuring the appropriateness of medications prescribed, conducting therapeutic drug monitoring, and making clinical interventions to ensure a safe and effective therapy. By utilizing this newly integrated telepsychiatry model, pharmacists have continued to remain an integral part of improving patients' health outcomes and overall patient experience for psychiatric patients.

## Abbreviations

JHAH	Johns Hopkins Aramco Healthcare
COVID-19	Coronavirus Disease 2019
BD	Bipolar disorder
CIWA	The Clinical Institute Withdrawal Assessment for Alcohol
LAIA	Long-acting injectable antipsychotics
PMC	Psychiatric medication management clinic

## Introduction

COVID-19 has made an incredible mark on society as a whole but in particular our health care systems. The capacity of healthcare systems was stretched in several ways, such as the global shortage of medications, including some life-saving medications, major obstacles in accessing patient care and exacerbation of the shortage of healthcare professionals (Khojah et al., 2021; Wijesooriya et al., 2020).

Pharmacists have always been considered as one of the most trusted and accessible health care professions, and throughout the pandemic, pharmacists have continued to demonstrate their strength and adaptability in patient care in numerous ways. (Mukattash et al., 2021; Visacri et al., 2021) COVID-19 pandemic has been especially challenging for high-risk patients such as those who are immunocompromised or geriatric patients. In addition, it has posed great challenges in managing patients with psychiatric illnesses. For the most part, the focus of health care has been shifted to managing the patients with COVID-19 infections. Other areas such as psychiatry are likely to be overlooked. Ensuring that patients with mental health disorders are not ignored during the pandemic is very important.

To dampen the effects of COVID-19 on human health, especially in terms of urgently growing healthcare needs for an already overburdened healthcare system, transformation to telehealth or telemedicine during the pandemic has shown positive results. (Hollander & Carr, 2020) Telepsychiatry

✉ Savera Arain  
Savera.arain.1@jhah.com; saveraarain@gmail.com  
Majed Al Shakori  
Majed.shakhori@jhah.com; Mrlool2006@gmail.com  
Shabeer Ali Thorakkattil  
shabeer.thorakkattil@jhah.com; tkspharma@gmail.com  
Syed Iqbal Mohiuddin  
syed.mohiuddin.1@jhah.com;  
Sdiqbal.mohiuddin@gmail.com  
Fuad Al-Ghamdi  
Fuad.ghamdi@jhah.com

<sup>1</sup> Pharmacy Services Department, Johns Hopkins Aramco Healthcare (JHAH), Dhahran, Saudi Arabia

uses telemedicine or the telemental health model to provide treatment. Compared to other specialties, telepsychiatry is a suitable alternative for remote consultation. (O'Brien & McNicholas, n.d.) In terms of its overall outcome and clinical assessment potential, telepsychiatry services are equally, if not more reliable, than a regular face-to-face consultation. (Hubley et al., 2016) A study among Parkinson's disease patients reported a better patient satisfaction score with the telemedicine approach. (Seritan et al., 2019) Another study in the group of severe anxiety patients reported their preference of telepsychiatry services over face-to-face consultation. (*Telepsychiatry Toolkit Home*, n.d.) Overall, with their extensive knowledge of medication management and advanced clinical skills psychiatric pharmacist plays a crucial role in monitoring medication effectiveness and side effects, optimizing medication therapy plans, discontinuing unnecessary medications and ensuring safe use of high risk medications. By utilizing the telemedicine health model, the psychiatric pharmacist has been able to deliver person-centered care by increasing their availability and access to mental health care.

### Spectrum of Challenges Posed By COVID-19 Pandemic on Mental Health Patients

The COVID-19 pandemic has explicitly been challenging for our health care systems worldwide. With several restrictive measures imposed, especially a complete lockdown of some areas, the patient could not physically access their healthcare providers. The COVID-19 pandemic caused several sudden disruptions to healthcare delivery worldwide, affecting 93% of the countries globally. According to the WHO survey, the demand for mental health increased during the pandemic. Patient counseling and psychotherapy has faced more challenges and reported approximately 67% disruption rate, 65% to critical harm reduction services, and 45% to opioid agonist maintenance treatment for opioid dependence. In addition, around 35% reported disruption in access to care for emergency admissions, including the patient who experienced prolonged seizures, severe substance use withdrawal syndromes and delirium. Also, patients with mental, neurological and substance use disorders had difficulty in access to patient care and medications. (*COVID-19 Disrupting Mental Health Services in Most Countries, WHO Survey*, n.d.)

Patients with mental health disorders have a higher susceptibility to infections, including pneumonia, and their risk of becoming infected rises during the epidemics (Seminog & Goldacre, 2013). Several reasons such as cognitive impairment, lower risk awareness, and confined conditions in psychiatric wards contribute to this. Also, if patients with mental health disorders contract COVID-19, they have additional barriers to timely treatment due to discrimination

associated with mental health. This situation is worsened for patients with COVID-19 and comorbid mental health disorders (Sartorius, 2013).

The pandemic has brought widespread fear and anxiety due to its substantial effect on people's lives and livelihoods. This contributed to increasing rates of anxiety, depression, and emotional disorders. People with mental health conditions are very fragile, and they have been more influenced emotionally by the pandemic. If left untreated, these patients can relapse or face worsening mental diagnoses. With our entire health care system completely overwhelmed with the pandemic, there was an immediate need to change our current workflow system to ensure continuity of care. Several workflow changes were made to ensure our patients with mental health disorders continue to receive person-centered care.

As a response measure to COVID-19, the pharmacy services department at Johns Hopkins Aramco Healthcare (JHAH) took several initiatives focusing on infection control and overcoming everyday operational challenges and measures were taken to leverage pharmacists in telehealth services (Arain et al., 2021; Thorakkattil et al., 2021). The ambulatory pharmacy adopted innovative methods such as launching medication home delivery, setting up the pharmacy call center to enable patient consultations and refill requests, and online health portal application services (AlAbbasi et al., 2021). One of the most successful implementations was the launch of a pharmacist-led tele medication management clinic in ambulatory care settings. This innovative model not only enabled the JHAH patients to continue to have access to healthcare services but has also been associated with positive outcomes in other areas, such as improving medication adherence and preventing interruption of therapies for chronic health conditions (Mohiuddin et al., 2021).

### Implementation of Telehealth Pharmacist-led Psychiatric Services

JHAH developed a seamless interactive platform to enhance patients' accessibility to bypass the challenges shaped by the Covid-19 pandemic. At JHAH, we used the electronic health record (EHR) software provided by Epic Systems Co. (Verona, WI, USA) (*Epic | ...with the Patient at the Heart*, n.d.). The requirements for the telephonic visit and video consultation, such as computer, telephone, camera, and other software and hardware supports, were fulfilled. To improve access to care, telepsychiatry services are offered to all patients following treatment with the mental health unit at JHAH. The teleconsultations provided by psychiatric medication management clinic (PMC) with psychiatric

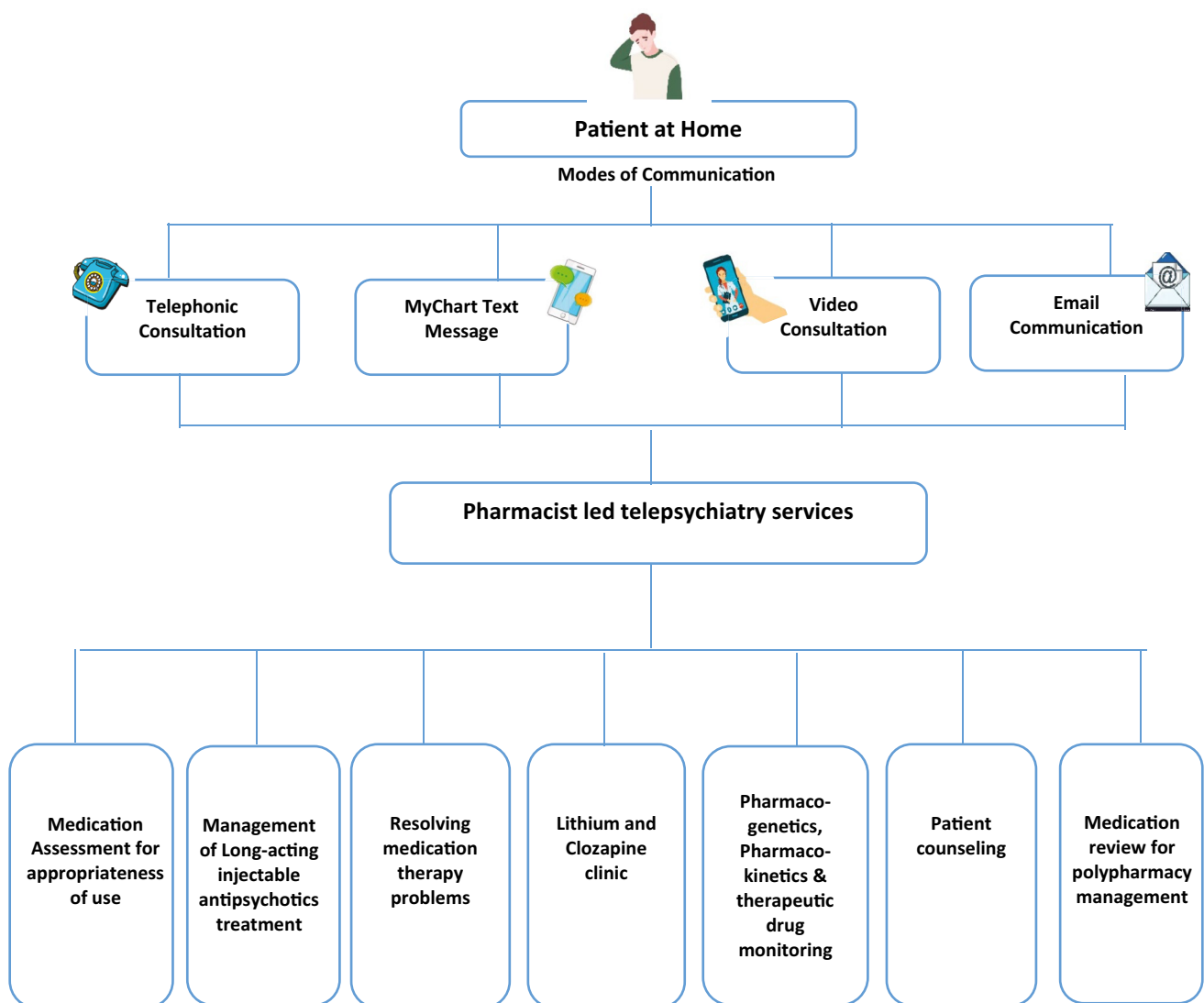
pharmacists include telephonic or virtual consultation, MyChart text message, and email communication.

### Telephonic PMC Consultation Process

The service expansion includes a direct phone call with a designated number for the psychiatric clinic where the pharmacist receives the patient's call during working hours. Patients can also utilize this service by contacting the mental health front desk through an interactive voice response (IVR) system to direct patient calls to the psychiatric clinic. JHAH has a toll-free number and all eligible JHAH patients can

contact the mental health department through this toll-free number. Additionally, the patient can contact the pharmacist via the call center. The call center sends the pharmacist a message received as an in-basket message. The system immediately prompts the pharmacist that a new message has been received. The pharmacist then calls the patient to address their need.

All personnel involved, including call center employees, have been provided proper training on receiving and transferring messages to the psychiatric pharmacist to help patients who do not have internet access or do not prefer to use MyChart for text messages or video calls. (Figure 1).



**Fig. 1** The flowchart of mode of communications and services provided by pharmacist led tele psychiatric clinic

## Video PMC Consultation Process

The pharmacist at the telepsychiatric clinic uses the MyChart application enabled video conference call to offer a secure, face-to-face virtual interaction with the patient. The patient schedules a video consultation appointment via MyChart account, and this method requires the patient to have access to either a personal computer, a smartphone, or an electronic tablet. A video call application named ‘Extended Care’ must be downloaded from the Apple store or Google Play store. This application is integrated with the patient portal MyChart and patients will be automatically logged in to this application. This app is custom-built for MyChart users and free of cost. Patients receive notification by SMS or email to initiate the video consultation. To start the video visit patient has to log in to MyChart and click on the video visit link. The system will prompt the patient to download the “Extended care” application upon the first video appointment. Subsequently, all future video appointments are integrated directly with this application. Once the patient log-in is confirmed, the pharmacist begins the video consultation. There is a ten-minute window upon which if the patient has failed to check in to their designated appointment time, the pharmacist attempts to reach the patient over the phone. This is important to confirm that the patient is not facing any technical issues in joining the video conference. The video call is used to ensure any medication-related issues are resolved, and the pharmacist uses both verbal and non-verbal cues to complete the patient’s psychiatric assessment. Upon completing the call, the pharmacist documents this patient encounter in progress notes in the institutional computerized physician order entry (CPOE) system.

## MyChart Text Message

Epic online patient portal MyChart can be downloaded from the Apple store or Play store and is accessible to all JHAH patients (*About MyChart | Johns Hopkins Aramco Healthcare, n.d.*). The mental and behavioral health patients can communicate medication-related queries with the psychiatric pharmacist through MyChart. The psychiatric pharmacist can reply directly to the patient through MyChart, which will help the patient manage any of their medication-related issues without traveling and scheduling a physical appointment. MyChart has a proven track record in its utilization at JHAH especially during the COVID-19 pandemic and was highly useful in increasing the access to care for the patients at JHAH (Thorakkattil et al., 2022).

## Email Communication

Communication with a psychiatric pharmacist through a dedicated confidential business address is also available for

patients. Patients must use their medical record number, government-issued national ID or residence permit as a reference while communicating with the psychiatric pharmacist. The psychiatric pharmacist can access the patients' medical records in Epic and correspond with the patient via email.

## Telehealth Medication Therapy Management Services By the Psychiatric Pharmacist

The clinical pharmacist at Johns Hopkins Aramco health-care covering the psychiatric unit traditionally conducts several vital roles. These include following patients’ progress during their hospital admission and managing several neuropsychiatric disorders in inpatient and outpatient settings, including depression, anxiety disorder, attention deficit hyperactivity disorder, personality disorders, schizophrenia, bipolar disorder, and substance abuse disorder. The following are the major medication management services provided by the psychiatric clinical pharmacist via the telehealth platform. All patients are eligible for this service unless they have suicidal ideation, homicidal ideation with imminent danger to harm others, target psychiatric symptoms not responsive to medication therapy, or patients in need of additional diagnostic assessments.

## Medication Assessment for Appropriateness of Use

The psychiatric pharmacist collaborates with psychiatrists and nursing to coordinate patient care for patients admitted to the hospital. This role includes medication assessment, therapy plan adjustments, and monitoring drug-drug, drug-disease and drug-food interactions. Using telehealth tools the pharmacist can decrease medication errors and patient harm by obtaining, verifying, and documenting patients' current prescription and over-the-counter medications, including vitamins, supplements, and herbals. The pharmacist completes the assessment by interviewing patients and/or caregivers using telepsychiatric services (phone or video), and resolving any discrepancies after consulting with the prescriber and documenting changes electronically.

## Resolving Medication Therapy Problems

The majority of psychiatric medications are unique because they require slow upward titration and careful tapering. The pharmacist ensures that doses are appropriately titrated and the patient receives optimal doses without experiencing side effects. The benefits of antipsychotic medications are sometimes complicated by their side effects. While some

are relatively minor related to tolerance (e.g., mild sedation or dry mouth), others can be unpleasant (e.g., constipation, akathisia, sexual dysfunction) or painful (e.g., acute dystonias) or disfiguring (e.g., weight gain, tardive dyskinesia) or life-threatening (e.g., myocarditis, agranulocytosis). (Stroup & Gray, 2018) Also, non-adherence rates to psychotropic medications, such as those used for treating bipolar disorder, depression, substance use disorders, and schizophrenia, are as high as 60%. (Stroup & Gray, 2018).

At JHAH, the psychiatric pharmacist plays a crucial clinical role by managing the patients' side effects and observing non-adherence that may result from the patients' self-discontinuation of their medications due to intolerable side effects or the stigma attached to mental health disorders. This was one of the key areas that pharmacists could continue to accomplish using telehealth by providing clear information, coping mechanisms, motivational and emotional support and improving adherence by sharing the benefits of treatment and helping patients envision the benefits of long-term treatment. Due to restrictions such as the complete lockdown of cities during the COVID-19, using telehealth by a pharmacist became vital to ensure patient adherence to their medication to prevent relapse or decompensation of patients' mental disorder.

### Pharmacogenetics, Pharmacokinetics and Therapeutic Drug Monitoring

In addition to having several side effects, antipsychotic medications have complex monitoring involved. Pharmacogenetics is a field of medicine that studies genetic response leading to individual variation in drug response (Spina & Leon, 2017). Several differences are found in the efficacy of psychiatric medications because most of these undergo extensive hepatic metabolism (Horvitz-Lennon et al., 2017). Genotyping is a relatively new trend for monitoring patients who are not responding to treatment. For example, if a patient shows severe side effects to a low dose or no response to a higher dose, and factors such as non-adherence or drug-interaction etc. doesn't exist, genotyping can be done to see if the patient has a specific genetic variation or phenotype that may be causing the unusual response to the medication. This is advantageous when therapeutic ranges are known (e.g., haloperidol) and to identify slow or rapid metabolizers (e.g., fluphenazine, risperidone), leading to better results after adjusting the dosage. If needed, the pharmacist intervenes to recommend the treatment team physician to orders the plasma levels for patients experiencing sub-optimal responses and adjusts the dosage or the medication interval accordingly. Ordering plasma levels is currently limited in practice to those patients who exhibit poor adherence or poor tolerance.

The antipsychotics also have multiple kinetics issues, which could be independent of the patient's adherence issues. Poor tolerance may occur for drugs with dose-dependent side effects even when the dosage is appropriate if the patient eliminates the drug slowly because of pharmacokinetics or poor metabolism (Müller-Oerlinghausen & Lewitzka, 2016). Examples include high-potency first-generation antipsychotics such as haloperidol and selected second-generation antipsychotics whose dose-dependent risk for extrapyramidal symptoms and prolactin elevation (Horvitz-Lennon et al., 2017). The psychiatric pharmacist at JHAH in collaboration with the physician, can order the genotyping if necessary and determine the appropriate course of action based on the findings. Another example of medication with complex metabolism is clozapine. Several factors affect clozapine concentrations, such as the patient's age and smoking patterns (Khokhar et al., 2018). Hence the psychiatric pharmacist, given the specialized skills and knowledge, assumes the responsibility of therapeutic drug monitoring to account for individual variations and avoid toxicity.

During the COVID-19 pandemic, the pharmacist continued to provide this set of expertise using telehealth. The pharmacist interviewed the patients by telephone or video calls to observe for signs of poor adherence and discuss tolerance issues. Also, the mental status examination was conducted, and observations for the patient's appearance, any abnormal speech characteristics, mood and affect, sensorium, insight, body posture, eye contact, and tone of voice were all observed. Any unusual changes from the previous encounter were documented electronically in the patient's progress notes.

Following virtual assessment, the pharmacist as part of treatment team recommended and made any dose adjustments necessary, and possible pharmacokinetics and pharmacogenetics factors affecting the patient's current mental status were assessed. The patient was reinforced to continue therapy by providing reassurance of access to care via the telehealth model. Upon referral from the physician, the pharmacist used telehealth for a thorough assessment of patients started on new psychotropic medications. An example of this would be a patient who recently started on lamotrigine and needed to be monitored for the development of any side effects such as skin rash. In such cases, the pharmacist assessed the severity of the side effect and intervened immediately, including instructing the patient to contact the emergency department if deemed necessary.

### Therapy Management of Long-acting Injectable Antipsychotics

The national council for behavioral health recommends offering long-acting injectable antipsychotic medications



for patients with schizophrenia, schizoaffective disorder or bipolar disorder. They are suggested to be a superior alternative to oral medications as an early treatment option for individuals with schizophrenia, schizoaffective disorder or bipolar disorder. By using them earlier in the treatment, providers can prevent negative outcomes in the patients, such as failed oral medication, discontinuation risk, multiple relapses, or hospitalizations (Baweja et al., n.d.). Given the advantages of these long-acting injectable antipsychotics LAIA, the psychiatric pharmacist at Johns Hopkins Aramco Healthcare has, in collaboration with the informatics team, developed “therapy plans” for patients on paliperidone risperidone, haloperidol, and zuclopenthixol long-acting injectable antipsychotics in the electronic health record system. The therapy plans are extremely accurate, and it ensures that patient receives their LAIA at correct intervals. Also, the therapy plans are opened in the electronic health record upon each patient encounter, hence allowing the pharmacist to make progress notes documenting any new observations or concerns about the patient use of the LAIA. During the pandemic, telehealth and in-person visits have been used to provide person-centered care for patients on LAIAs.

The pharmacist used telehealth, obtained the patient’s clinical information, reviewed progress notes, and collaborated with other providers to ensure all preparation for the clinic visit was completed prior to the patient’s arrival to minimize stay during the clinic visit for LAIA administration. The patients or caregivers were arranged a supply of injection to be received at a contracted facility by a nurse with a follow-up with the pharmacist via telehealth post-injection administration to continue treatment monitoring. In some instances, the contracted facility did not carry the strength of the injectable that the patient was receiving at JHAH. The pharmacist provided information regarding equivalent doses for the available strengths to the patient’s medical providers to avoid interruption or delay in therapy. The pharmacist provided education and information about post-injection monitoring. The skills and knowledge of the psychiatric pharmacist were instrumental in this case as LAIAs offer flexibility in administration timings based on their pharmacokinetics. If the patient’s treatment was delayed due to missed clinic visits, the pharmacist can use their expertise in applying knowledge and guidelines for delayed or missed doses. Also, if necessary, the pharmacist could recommend and arrange for oral antipsychotics as supplemental medications to be prescribed using electronic prescribing to avoid adverse effects due to delay of administration of LAIA.

### Lithium and Clozapine Clinic

Lithium and clozapine are unique psychotropic medications as they exert anti-suicidal effects. These properties

of lithium and clozapine are linked to the changes in post-synaptic 5-HT<sub>1A</sub> receptor activity as a possible neurobiological mechanism for these effects (Kaschka & Rujescu, 2015). The psychiatric pharmacist at JHAH offers a unique service of managing the therapy of patients on clozapine and lithium in an ambulatory clinic setting. Due to its side effect profile and rigorous monitoring, there are many barriers to clozapine prescribing. The psychiatric pharmacist collaborates with the physicians to overcome these barriers by supporting and facilitating both the availability and administration of antipsychotics. While clozapine has a better efficacy profile than other antipsychotics for patients with resistant schizophrenia and other serious mental illnesses, unfortunately, it is associated with several serious side effects. The common side effects are hypersalivation, tachycardia, enuresis, sweating, eosinophilia, metabolic syndrome, and constipation. Also, it has more serious side effects such as myocarditis, risk of cardiomyopathy, dose-dependent risk of seizures, and severe neutropenia (Kelly & Love, 2019).

Given the serious side effect profile, the pharmacist uses a patient-centered approach, carefully assessing risk vs. benefits, and supports the patient in safely using and benefiting from a challenging clozapine treatment. The pharmacist in psychiatric service designs the individualized clozapine therapy plan ensuring appropriate initial doses are used, adjusting maintenance doses and cross-tapering when other antipsychotics are started or stopped. Clozapine has the propensity to cause both neutropenia and agranulocytosis hence the pharmacist carries out vigorous lab work monitoring, especially for the blood counts.

Lithium has effective mood-stabilizing properties and is therefore used as a cornerstone therapy for bipolar disorder, especially for acute mania and maintenance treatment. It reduces the risk of suicide and developing neurocognitive disorder in bipolar disorder patients.

However, it has a disadvantage as its administration is complex and requires vigorous monitoring. The clinical guidelines recommending lithium use and monitoring have varying literature specially for its use in acute bipolar depression and special populations such as youth, pregnancy and older adults, making lithium medication management complex (Cipriani et al., 2013; Malhi et al., 2017). Lithium has a narrow therapeutic index and even small changes in lithium levels in the blood can result in lithium toxicity or lithium poisoning. All patients on lithium are closely monitored in the clinic by the psychiatric pharmacist who recommends necessary blood tests, tests for urea and electrolytes (including sodium and calcium), serum creatinine/renal function and thyroid function. The pharmacist can also recommend electrocardiogram testing and monitoring for patients who have significant risk factors for existing cardiovascular disease. Upon initiation of lithium, the

pharmacist orders plasma lithium level 5–7 days after starting and after every dose increase or formulation change. The levels are ordered more frequently if the patient has an impaired kidney function or has a change in concurrent medications. Also, the pharmacist screens the medication profile for medications, for example, thiazide diuretics, ACE inhibitors, and non-steroidal anti-inflammatory, which can potentially interact with lithium.

During the pandemic, the clinic visits were shifted to telehealth visits for patients on clozapine and lithium. A list of patients on both clozapine and lithium was collected using the electronic report of medication use evaluation from electronic health records (EHR). The pharmacist used this reporting system to track patients who were due for lithium levels. Using a provider contract agreement, patients in quarantined areas were asked to do follow-up lab work in contracted clinics or hospitals. Once the lab work results were available, the pharmacist followed up with the patient over the phone and any medication therapy adjustments if necessary were made.

Due to risk of severe agranulocytosis clozapine required vigorous absolute neutrophil count (ANC) monitoring. The Covid-19 pandemic created a serious challenge for patients and providers to have routine clozapine-associated absolute neutrophil count (ANC) testing. Under normal circumstances, hematologic monitoring for clozapine decreases from every week after six months to every two weeks until one year, and then to monthly. Without verifying that the (ANC) is in the desired range, the pharmacist cannot dispense clozapine to the patient. Due to the limitations imposed, such as travel restrictions, the psychiatric pharmacist maintained monthly patient contact via telehealth. The patients were informed of the contracted locations to obtain blood work. The level results obtained were used to make clinical assessment and decisions, particularly for dose adjustments, poor response, and most importantly, deferring the next level if the benefit outweighed the therapy risk. Patients on clozapine received a regular assessment, mental state monitoring, and medication monitoring using telehealth, irrespective of (ANC) monitoring.

### Patient Counseling

Patients with psychiatric disorders pose challenges about medication adherence and lack of proper medication use knowledge and understanding of how medications work and the time needed for full efficacy. The recommended duration of therapy might affect medication adherence and clinical outcomes. The psychiatric pharmacist's role in patient counseling may have been instrumental in achieving positive outcomes especially promoting optimal medication use. Psychiatric patients have fragmented mental health with cognitive and behavioral limitations, which increases medication

non-adherence (Yong et al., 2021). Patient medication non-adherence, especially in psychiatric patients, is a potential barrier to achieving positive therapeutic outcomes. Periodic assessment is required for medication adherence among patients with psychiatric disorders (Stentzel et al., 2018).

Virtual consultation services initiated at JHAH in response to the COVID-19 pandemic are conducted by a board-certified psychiatric clinical pharmacist and includes comprehensive patient counseling for psychiatric patients. During consultation pharmacist interviews the patient using open-ended questions about dosing, side effects observed and improvement or worsening of symptoms. The pharmacist assesses the patient's medication knowledge about the usage and expected outcomes from treatment and it is documented in patient's electronic medical record. JHAH offers two-way communication as pharmacists and patients are comfortable. Patients can easily access this service from their homes, providing a more accessible and safer alternative to in-person counseling during the COVID-19 pandemic. Also, since patients sometimes received medications from a JHAH contracted hospital during the pandemic, they could reach out to their pharmacist electronically and seek confirmation regarding alternative products for a possible brand change.

### Medication Review for Polypharmacy

Psychotropic polypharmacy is the combination of more than two psychotropic drugs. The incidence of side effects incidence is higher when compared to antipsychotic monotherapy, which includes extrapyramidal symptoms, sedation, and cognitive impairment, and is also associated with increased hospitalization (Rubio-Valera et al., 2014). Patients often visit multiple physicians for their depression and anxiety treatments. They are at higher risk of drug-drug interactions that affect the clinical efficacy of long-term treatment. Psychotropic medications are often prescribed in older adult patients with other medications, which can be problematic for this age group. Pharmacists are medication experts, so they play an important role in identifying and resolving medication-related problems during medication review (Lin, 2020). Most patients receive multiple medications or high-dose psychotropic medications during an acute exacerbation event.

According to clinical judgment, the medication used should be tapered in the maintenance phase. Yet, many clinicians have been reluctant to adjust medication dosages, leading to a higher rate of polypharmacy or high-dose prescriptions of psychotropic medications (Stuhe et al., 2019).

Through a virtual clinic appointment at JHAH, the psychiatric clinical pharmacist provides a broad patient chart

review and polypharmacy management. Psychiatric pharmacist-led psychotropic medications review plays a vital role in the safety of psychiatric patients. It helps resolve medication-related problems like high dosage, adverse drug reactions, and sub-therapeutic dosing. Psychiatric clinical pharmacists also offer de-prescribing of medications after consultation with treating physicians if deemed necessary.

## Challenges in Utilizing Telehealth for Psychiatric Patients

Several innovations have been made in healthcare due to the COVID-19 pandemic. It proved the need for a telehealth option during times of crisis and our acceptability of a combination of telehealth and in-person visit as a more prudent option for providing person-centered and accessible healthcare for psychiatric patients. However, the psychiatric pharmacist must be knowledgeable and consider factors such as the patient's age, behavioral health, and cognitive status to determine if telehealth is an appropriate tool for that particular patient.

There are several challenges in utilizing telehealth for this special population. These include patient preference as not all patients prefer telehealth. Also, these patients may have depression and lack interest in their treatment, resulting in poor compliance or distraction during the telehealth appointment. Also, the patients may face challenges depending on their cognitive state to learn how to use telehealth options to connect to their providers. Patients with Parkinson's disease have limitations due to motor impairments such as tremors and muscle rigidity, which may make muscle rigidity difficult for them to use telehealth. Also, patients with Alzheimer's disease, dementia, or other cognitive impairment may face telehealth challenges due to technological literacy and memory problems. They will need support from a caregiver at home to help facilitate the encounter. Some psychiatric patients have emotional difficulties and a shattered sense of self and hence may require the physical presence of the provider as reassurance. Also, some patients have difficulty maintaining eye contact, are too agitated, lack focus or are inattentive, too agitated, lack focus, or are inattentive, and use a camera to connect to them can be particularly challenging. Some pharmacy services are not suitable for telepsychiatry, such as performing a physical assessment of movement disorder, mini-mental examination, and some clinician-rated rating scale ex CIWA.

## Conclusion

COVID-19 pandemic has imposed a critical need to develop innovative strategies to overcome barriers in patient care, especially for vulnerable populations such as patients with

mental health problems. As a response measure, Johns Hopkins Aramco Healthcare successfully launched a pharmacist-led telepsychiatry clinic to increase access to quality mental health care and provide comprehensive medication management. This pharmacist-led telepsychiatry clinic has proven to be a valuable alternative to traditional methods, and pharmacists are able to assess patient's medications for their appropriateness of use, manage long-acting injectable antipsychotics, resolve medication therapy problems, continue clinical assessment of patients on lithium and clozapine, perform necessary therapeutic drug monitoring utilizing both pharmacogenetics and pharmacokinetics, provide patient counseling and prevent polypharmacy by utilizing the implemented JHAH telehealth model. While the telehealth model has some distinct challenges for this patient population, it's person-centered care foundation has proven to be very beneficial and has played a vital role in delivering high quality, effective, and compassionate care for our patients. The JHAH telehealth model has enabled the pharmacist to help psychiatric patients overcome access to healthcare, specially due to the regulations imposed during the COVID-19 pandemic, and patients have continued to demonstrate satisfaction with the services provided. While the overall efficacy of telehealth models is still being established in the literature, and its widespread use for patient care is becoming more developed, it will still be beneficial for all health care organizations to explore this option as the COVID-19 pandemic continues to reform health care systems worldwide.

**Acknowledgements** We authors thank Johns Hopkins Aramco Health care, Saudi Arabia, for providing us an opportunity to write and publish this manuscript.

**Funding** None.

## Declarations

**Conflict of Interest** The authors declare no competing interests.

## References

- About MyChart | Johns Hopkins Aramco Healthcare. (n.d.). Retrieved July 4, 2022, from <https://www.jhah.com/en/about-mycharta>
- AlAbbasi, H. K., Thorakkattil, S. A., Mohiuddin, S. I., Nemr, H. S., Jabbour, R., & Al-Ghamdi, F. (2021). Implementation and effectiveness of drive-through medication pick-up and home delivery services. A patient safety initiative during COVID-19 pandemic. *Journal of Patient Safety and Risk Management*, 26(4), 179–186. <https://doi.org/10.1177/25160435211009038>
- Arain, S., Thalappambath, R., & Al Ghamdi, F. H. (2021). COVID-19 pandemic: Response plan by the Johns Hopkins Aramco Healthcare inpatient pharmacy department. *Research in Social & Administrative Pharmacy: RSAP*, 17(1), 2009–2011. <https://doi.org/10.1016/j.sapharm.2020.05.016>



- Baweja, R., Sedky, K., & Lippmann, S. (2012). Long-acting antipsychotic medications. *Current Drug Targets*, 13(4), 555–560. <https://doi.org/10.2174/138945012799499785>
- Cipriani, A., Hawton, K., Stockton, S., & Geddes, J. R. (2013). Lithium in the prevention of suicide in mood disorders: Updated systematic review and meta-analysis. *BMJ (clinical Research Ed.)*, 346, f3646. <https://doi.org/10.1136/bmj.f3646>
- COVID-19 disrupting mental health services in most countries, WHO survey. (n.d.). Retrieved July 4, 2022, from <https://www.who.int/news/item/05-10-2020-covid-19-disrupting-mental-health-services-in-most-countries-who-survey>
- Epic with the patient at the heart. (n.d.). Retrieved July 4, 2022, from <https://www.epic.com/>
- Hollander, J. E., & Carr, B. G. (2020). Virtually Perfect? Telemedicine for Covid-19. *New England Journal of Medicine*, 382(18), 1679–1681. <https://doi.org/10.1056/NEJMp2003539>
- Horvitz-Lennon, M., Mattke, S., Predmore, Z., & Howes, O. D. (2017). The Role of Antipsychotic Plasma Levels in the Treatment of Schizophrenia. *American Journal of Psychiatry*, 174(5), 421–426. <https://doi.org/10.1176/appi.ajp.2016.16040402>
- Hubley, S., Lynch, S. B., Schneck, C., Thomas, M., & Shore, J. (2016). Review of key telepsychiatry outcomes. *World Journal of Psychiatry*, 6(2), 269–282. <https://doi.org/10.5498/wjp.v6.i2.269>
- Kaschka, W., & Rujescu, D. (2015). Biological aspects of suicidal behavior. <https://doi.org/10.1159/ISBN.978-3-318-05584-9>
- Kelly, D. L., & Love, R. C. (2019). Psychiatric pharmacist's role in overcoming barriers to clozapine use and improving management. *The Mental Health Clinician*, 9(2), 64–69. <https://doi.org/10.9740/mhc.2019.03.064>
- Khojah, H. M. J., Itani, R., Mukattash, T. L., Karout, S., Jaffal, F., & Abu-Farha, R. (2021). Exposure of community pharmacists to COVID-19: A multinational cross-sectional study. *Journal of Taibah University Medical Sciences*, 16(6), 920–928. <https://doi.org/10.1016/j.jtumed.2021.06.007>
- Khokhar, J. Y., Henricks, A. M., Sullivan, E. D. K., & Green, A. I. (2018). Unique Effects of Clozapine: A Pharmacological Perspective. *Advances in Pharmacology (San Diego, Calif.)*, 82, 137–162. <https://doi.org/10.1016/bs.apha.2017.09.009>
- Lin, S.-K. (2020). Antipsychotic Polypharmacy: A Dirty Little Secret or a Fashion? *The International Journal of Neuropsychopharmacology*, 23(2), 125–131. <https://doi.org/10.1093/ijnp/pyz068>
- Malhi, G. S., Gessler, D., & Outhred, T. (2017). The use of lithium for the treatment of bipolar disorder: Recommendations from clinical practice guidelines. *Journal of Affective Disorders*, 217, 266–280. <https://doi.org/10.1016/j.jad.2017.03.052>
- Mohiuddin, S. I., Thorakkattil, S. A., Abushoumi, F., Nemr, H. S., Jabbour, R., & Al-Ghamdi, F. (2021). Implementation of pharmacist-led tele medication management clinic in ambulatory care settings: A patient-centered care model in COVID-19 Era. *Exploratory Research in Clinical and Social Pharmacy*, 4, 100083. <https://doi.org/10.1016/j.rcsop.2021.100083>
- Mukattash, T. L., Jarab, A. S., Al-Qerem, W., Abu Farha, R. K., Itani, R., Karout, S., Mukattash, I. L., & Basheti, I. (2021). Providing pharmaceutical care during the COVID-19 pandemic: Attitudes and experiences of home-treated patients in Jordan. *Journal of Pharmaceutical Health Services Research*, 12(2), 321–324. <https://doi.org/10.1093/jphsr/rmab010>
- Müller-Oerlinghausen, B., & Lewitzka, U. (2016). *The Contributions of Lithium and Clozapine for the Prophylaxis and Treatment of Suicidal Behavior*. <https://doi.org/10.1159/000434747>
- O'Brien, M., & McNicholas, F. (n.d.). The use of telepsychiatry during COVID-19 and beyond. *Irish Journal of Psychological Medicine*, 1–6. <https://doi.org/10.1017/ijpm.2020.54>
- Rubio-Valera, M., Chen, T. F., & O'Reilly, C. L. (2014). New roles for pharmacists in community mental health care: A narrative review. *International Journal of Environmental Research and Public Health*, 11(10), 10967–10990. <https://doi.org/10.3390/ijerph111010967>
- Sartorius, N. (2013). Comorbidity of mental and physical diseases: A main challenge for medicine of the 21st century. *Shanghai Archives of Psychiatry*, 25(2), 68–69. <https://doi.org/10.3969/j.issn.1002-0829.2013.02.002>
- Seminog, O. O., & Goldacre, M. J. (2013). Risk of pneumonia and pneumococcal disease in people with severe mental illness: English record linkage studies. *Thorax*, 68(2), 171–176. <https://doi.org/10.1136/thoraxjnl-2012-202480>
- Seritan, A. L., Heiry, M., Iosif, A.-M., Dodge, M., & Ostrem, J. L. (2019). Telepsychiatry for patients with movement disorders: A feasibility and patient satisfaction study. *Journal of Clinical Movement Disorders*, 6, 1. <https://doi.org/10.1186/s40734-019-0077-y>
- Spina, E., & Leon, J. (2017). *What is the role of CYP genotyping in psychiatry?* <https://www.semanticscholar.org/paper/What-is-the-role-of-CYP-genotyping-in-psychiatry-Spina-Leon/4a0dfb82f7e01ac0212fd2ff2914953ce41528fb>
- Stentzel, U., van den Berg, N., Schulze, L. N., Schwaneberg, T., Radicke, F., Langosch, J. M., Freyberger, H. J., Hoffmann, W., & Grabe, H.-J. (2018). Predictors of medication adherence among patients with severe psychiatric disorders: Findings from the baseline assessment of a randomized controlled trial (Tecla). *BMC Psychiatry*, 18(1), 155. <https://doi.org/10.1186/s12888-018-1737-4>
- Stroup, T. S., & Gray, N. (2018). Management of common adverse effects of antipsychotic medications. *World Psychiatry: Official Journal of the World Psychiatric Association (WPA)*, 17(3), 341–356. <https://doi.org/10.1002/wps.20567>
- Stuhec, M., Bratović, N., & Mrhar, A. (2019). Impact of clinical pharmacist's interventions on pharmacotherapy management in elderly patients on polypharmacy with mental health problems including quality of life: A prospective non-randomized study. *Scientific Reports*, 9(1), 16856. <https://doi.org/10.1038/s41598-019-53057-w>
- Telepsychiatry Toolkit Home*. (n.d.). Retrieved December 29, 2021, from <https://www.psychiatry.org/psychiatrists/practice/telepsychiatry/toolkit>
- Thorakkattil, S. A., Nemr, H. S., Al-Ghamdi, F. H., Jabbour, R. J., & Al-Qaaneh, A. M. (2021). Structural and operational redesigning of patient-centered ambulatory care pharmacy services and its effectiveness during the COVID-19 pandemic. *Research in Social & Administrative Pharmacy: RSAP*, 17(1), 1838–1844. <https://doi.org/10.1016/j.sapharm.2020.06.017>
- Thorakkattil, S. A., Parakkal, S. A., Abushoumi, F., Nemr, H. S., Alhazza, H., Jabbour, R., & Al-Ghamdi, F. (2022). Online patient portal-based management of medication renewal and refill pickup in ambulatory care settings: A retrospective utilization study at tertiary care hospital in Saudi Arabia. *Saudi Pharmaceutical Journal: SPJ: The Official Publication of the Saudi Pharmaceutical Society*, 30(1), 45–52. <https://doi.org/10.1016/j.jsps.2021.12.016>
- Visacri, M. B., Figueiredo, I. V., de Lima, T., & M. (2021). Role of pharmacist during the COVID-19 pandemic: A scoping review. *Research in Social & Administrative Pharmacy: RSAP*, 17(1), 1799–1806. <https://doi.org/10.1016/j.sapharm.2020.07.003>
- Wijesooriya, N. R., Mishra, V., Brand, P. L. P., & Rubin, B. K. (2020). COVID-19 and telehealth, education, and research adaptations. *Paediatric Respiratory Reviews*, 35, 38–42. <https://doi.org/10.1016/j.prrv.2020.06.009>
- Yong, W.-Y., Chang, C.-T., Chew, C.-C., & Khoo, T.-E. (2021). Interactive virtual medication counselling in outpatient pharmacy: An accessible and safe patient counselling method during the COVID-19 pandemic. *Research in Social & Administrative Pharmacy: RSAP*, 17(10), 1860–1862. <https://doi.org/10.1016/j.sapharm.2021.07.002>