



Implementation of pharmacist-led tele medication management clinic in ambulatory care settings: A patient-centered care model in COVID-19 Era

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ABSTRACT

Over the past 20 years, owing to rapid advances in technological innovation, namely in telecommunication and telemedicine, healthcare institutions have integrated clinical practices with cutting-edge telecommunication technology to enhance access to patient care, improve continuity of clinical care, and ensure patient safety. Johns Hopkins Aramco Healthcare (JHAH) is a gold-certified tertiary care institution, and it is an excellent center for patient-centered care. In response to the Coronavirus 2019 (COVID-19) pandemic, it has adopted various telecommunication technologies to provide patient-care services. This article describes the integration of telecommunication technology, such as telephone and video consultation, with a pharmacist-led medication management clinic (MMC) to provide person-centered patient care services at JHAH. The JHAH pharmacy services were found to be essential in establishing face-to-face outcome-oriented pharmacist-led medication management services for patients requiring chronic ambulatory care. The established tele-MMC services enhanced patient engagement and treatment compliance, and the integration process and its challenges were assessed. Especially during this COVID-19 pandemic, the pharmacist-led tele-MMC services were beneficial to chronic disease patients and ensured the continuity of care, maintenance of up-to-date lab tests, management of polypharmacy, minimization of the use of unwanted medications and medication synchronization. Further, the pharmacist-led tele-MMC services provided comprehensive patient counseling, which included the use of visual aids. This new integrated model provides an example for other healthcare organizations to adopt and implement the program in ambulatory care settings, to better ensure the continuity of quality healthcare, especially for elderly patients and those with chronic diseases.

1. Introduction

Telehealth, also known as telemedicine, is defined as the use of electronic communication to exchange information regarding health from one area to another to improve a patient's outcomes.¹ Telehealth tools have become an integral part of the health care system; they enhance access to medical care, improve the patient experience, and most importantly, maintain continuity of care. Therefore, it is imperative to implement a telehealth model to provide medication management services to patients to improve patient engagement, enhance health outcomes, reduce healthcare costs, and improve clinical care.^{2,3}

Tele-pharmacy is the delivery of pharmaceutical care to patients using audio-visual telecommunication and information technologies remotely.^{4,5} The incorporation of telemedicine tools into current pharmacist-led medication management services efficiently utilizes time, resources, and clinical

pharmacist expertise to generate a patient-centered care model.^{6,7} The Ministry of Health (MOH), Saudi Arabia, initiated the telehealth framework in line with the Saudi Vision 2030, with the aim of developing telehealth networks.⁸ Recently, the Coronavirus 2019 (COVID-19) pandemic imposed challenges on providing quality health care services in the Kingdom of Saudi Arabia and throughout the world.^{9,10} During the crisis, the Saudi MOH launched a mobile application for online consultation and improved the continuity of care.¹¹

Elderly patients are more prone to medication-related problems and a risk of infection, especially during pandemics. Hence, it is imperative to provide quality remote pharmaceutical care services. Telehealth is also a vital tool that is required for the optimization of multi-modal medical therapies in patients with chronic conditions.¹² Using telehealth technologies, such as phones and video calls, patients can interact with clinical pharmacists with the convenience of being in their homes.¹³

Abbreviations: JHAH, Johns Hopkins Aramco Healthcare; COVID-19, Coronavirus Disease 2019; MMC, medication management clinic; MOH, Ministry of Health; IT, information technology.

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The Johns Hopkins Aramco Healthcare (JHAH) institution is an integrated healthcare delivery network that includes a tertiary care hospital and serves thousands of patients. It provides ambulatory medication management pharmacy services, offering advanced pharmaceutical care. In response to the COVID-19 pandemic, the JHAH ambulatory care pharmacy department implemented many structural changes at the operational level to ensure the continued care to their patients during the pandemic.¹⁴ Additionally, JHAH implemented home delivery and drive-through medication pickup services successfully during the pandemic, ensuring patient care services while maintaining social distancing and reducing the chance of hospital-acquired infections, including COVID-19.¹⁵

This article emphasizes the implementation of the pharmacist-led medication management clinic services in the JHAH ambulatory pharmacy care setting using communication technologies. The main objectives included practical implications for medication management and patient counseling. These telehealth services primarily target elderly patients who are chronically ill and stay at home but need frequent consultation with professional caregivers. These tools can be incorporated into medication management services for patients with comorbidities, such as diabetes, cardiovascular disorders, and respiratory problems, requiring polypharmacy.

2. Implementation of tele-medication management clinic (MMC)

2.1. medication management clinic

The MMC is a person-centered, outcomes-oriented pharmacist-managed interdependent practice that requires the pharmacist to collaborate with other healthcare providers and the patient to ensure the appropriateness of the therapy and medication order extension. Chronic disease management, as for diabetes, is the cornerstone for managing polypharmacy, medication non-adherence, and laboratory monitoring, which significantly affect patient health outcomes.^{14,16}

2.2. Implementation process

The JHAH pharmacy management and IT team evaluated the feasibility of integrating tele-medication consultation services for current MMC patients, as it will provide an advantage to person-centered care services. The readiness of the future implementation of tele-medication consultations was studied. After a consultation meeting between the JHAH pharmacy and information technology (IT) teams, the following considerations for implementing the tele-medication consultation services were formulated.

2.2.1. Technology requirements

We identified the prerequisite technologies for video and telephone visits, such as software, hardware, and other requirements, which included a telephone, computer, camera, and electronic health record (EHR) integration. At JHAH, we used the EHR software provided by Epic Systems Co. (Verona, WI, USA).¹⁷ The Epic team and the JHAH IT department worked together to set up the system for video calls and provide pharmacists with an application to schedule appointments and create drop-in appointments.

2.2.2. Patient eligibility criteria

JHAH started tele pharmacy integrated MMC services in ambulatory care pharmacy settings by developing the required criteria for patients to be seen through virtual video and telephone consultations. Patients with polypharmacy (use of four or more chronic medications) or needing special counseling were eligible for the video consultation appointments. All other patients could use the telephonic MMC services by calling the pharmacist at the pharmacy call center.

2.2.3. Scheduling an appointment

To schedule an appointment, the patients contacted the pharmacist by calling the pharmacy call center through an interactive voice response (IVR) system. JHAH has a toll-free number and all patients having

eligibility with JHAH can contact the pharmacy call center through this toll-free number. This number is very familiar among patients because it is displayed everywhere on hospital premises and is available on each auxiliary medication label. The pharmacist reviewed the patient's profile to ensure eligibility for an appointment with an MMC pharmacist. If the patient met the defined criteria to be seen at the MMC, the call center pharmacist would book an appointment for a virtual video consultation on the same day or the next day based on the available slots and documented the purpose of the visit (Fig. 1).

2.2.4. Staff training

Proper training was offered to the pharmacists working at the MMC to ensure that the assigned staff were able to manage virtual video visits and patient needs according to the established criteria and guidelines.

2.2.5. Video call MMC consultation process

JHAH has launched the MyChart video visit in response to COVID-19, offering safe virtual face-to-face interactions. To schedule a video call MMC consultation with a pharmacist, apart from an active MyChart account, patients need to have a personal computer, a smartphone, or a tablet. When using a personal computer, the recommended browsers are Google Chrome or Firefox. MyChart application is used for navigating health care information. An additional virtual video application called Extended Care will be downloaded by the patient from the Apple store or Google Play store but will be integrated with MyChart and checked automatically during the video consultation. There is no need to purchase this Extended Care application as it is a customized build for MyChart users. Patients received an email or SMS to remind them to start the video appointment, log into the Epic-MyChart, and click on the upcoming MyChart Video visit.¹⁸ During the first video visit, when logging in to MyChart, the system asked them to download the Extended Care application. The MyChart system automatically checked the patient through a virtual video Extended Care application in the subsequent appointments. Once the patient encounters were confirmed, the pharmacist started the video consultation. After 10 min, if the patient did not check in to MyChart, the pharmacist called the patient on the telephone, and if there was no response from the patient, the appointment was canceled and counted as a patient no-show. During the video call encounters, the patient collected and showed all medications that they used, and the pharmacists reviewed and compared the medications that were entered into the EPIC system in real-time. The pharmacist confirmed the medications used by the patient and discontinued them if they were unused or identified as therapeutic duplications. The pharmacist documented this in the Epic Hyperspace as a progress note. The services offered by the MMC video or telephonic consultations are explained in detail later in this article.

2.2.6. Telephonic MMC consultation process

Patients could call the call center pharmacist through an IVR system. If the patient required an MMC video consultation and met the eligibility criteria, the pharmacist would schedule the appointment for an available slot. In the case where only a telephonic consultation was required, the pharmacist provided medication management services through the telephone by applying the MMC guidelines under a collaborative consultation with the physicians (Fig. 2).

2.2.7. Implications of telemedicine management clinic services

In addition to the regular in-person MMC services provided by the pharmacist, the major services offered to patients through tele-MMC include patient counseling, prescription pick selection based on the location of choice, refill extension by renewing the refill medications, sending medication renewal requests to the treating physician, prescription de-escalation, and synchronization.

I. Patient education and counseling

The MMC pharmacist, either through virtual video calls or telephone consultations, offers comprehensive counseling to patients based on their needs. It includes, but is not limited to, clarification about dose frequency,

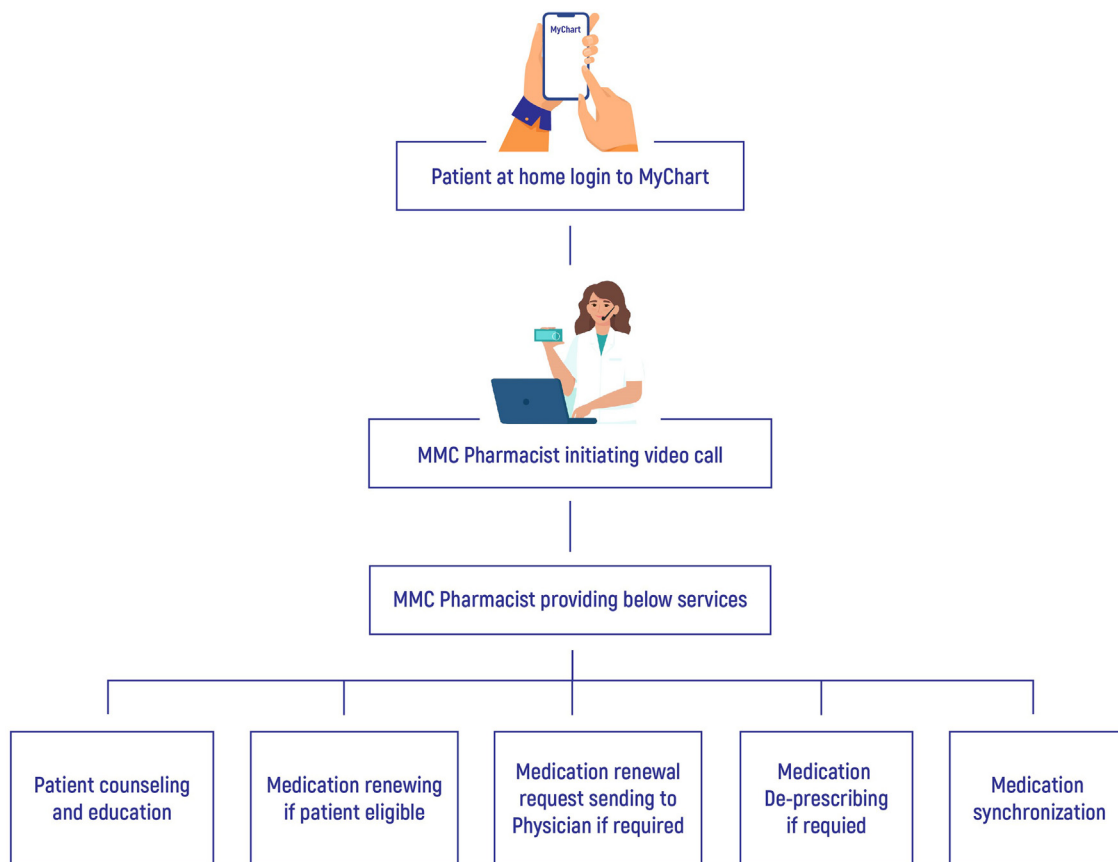


Fig. 1. Flow chart of the virtual medication management clinic (MMC) consultation process.

duration, brand changes, special techniques of using the medication, such as inhalers, self-administering injections, and polypharmacy management.

II. Extension of medication refill

The MMC pharmacist shall extend the duration of chronic medications if there is no refill available and the patient has difficulty getting an appointment with the treating physician. The refill extension through MMC is restricted in certain medication classes, such as narcotics and psychotropic medications, antibiotics, analgesics, antihistamines, immunosuppressants, chemo, and other hazardous medications. The MMC pharmacist consults with the patients' assigned physicians for any other medication-related issues.

III. Medication pick-up services

By using the Tele-MMC services, patients could request their medication to be collected from their preferred location, MMC pharmacists created the request, and the medication was processed in the ambulatory care pharmacy so that it can be delivered to the selected pick-up locations. JHAH is offering different pickup locations in different parts of Saudi Arabia. Patients can ask for their preferred location to collect their medications during the audio or video consultation with the pharmacist. The MMC pharmacist will choose that specific location based on the patient request, and medication will be delivered to that location. In this manner, the tele-MMC service helps the patient to bypass traveling to the hospital to collect their medications. Additionally, through the tele-MMC services, JHAH offered medication home delivery and drive-through pick-up services to eligible patients.¹⁴

IV. Medication synchronization

These services by the MMC pharmacists were beneficial for patients with polypharmacy, for which a refill of medications is required to be picked up on different dates. The patients have different medications, either from a different physician or from different appointments, making them come and collect their medication multiple times. The MMC pharmacist's

refill synchronization will make all medications due simultaneously, which will make the process convenient for the patients.

V. De-prescribing

The MMC pharmacist might consider a horizontal interdependent de-prescribing model once clinically necessary. During the chart review, the MMC pharmacist scrutinized the medication orders for their therapeutic validity. Any medication that the patients used without clinical support or that for which continuation was not necessary was discontinued after consulting with the treating physician. Similarly, if adding medications was beneficial, such as antiulcer medication for long-term analgesic use or supplemental medication based on chronic disease conditions, the MMC pharmacist would contact the physician to perform the necessary treatment modifications.

VI. Lab monitoring and requesting lab test

The MMC pharmacists could request lab tests for the patients whenever required based on their treatment condition, especially in cases of chronic diseases such as thyroid diseases, diabetes, and hyperlipidemia. If the patient did not undergo the lab test within the recommended period, the MMC pharmacist counseled the patient and ordered the lab request. In some instances, for specific lab tests, the pharmacist could contact the physician to schedule the test.

2.3. Benefits and scopes

The main benefits of tele-medication management clinic services include enhanced access to patient care, reduced risk of hospital-acquired infections, and patient convenience, which increased the patient care quality during a health crisis. This implemented model could increase patient satisfaction as the patient consulted the pharmacist for medication in the convenience of their homes and discussed medication in detail (with visual aids), which minimized the chances of adverse effects by discontinuing the

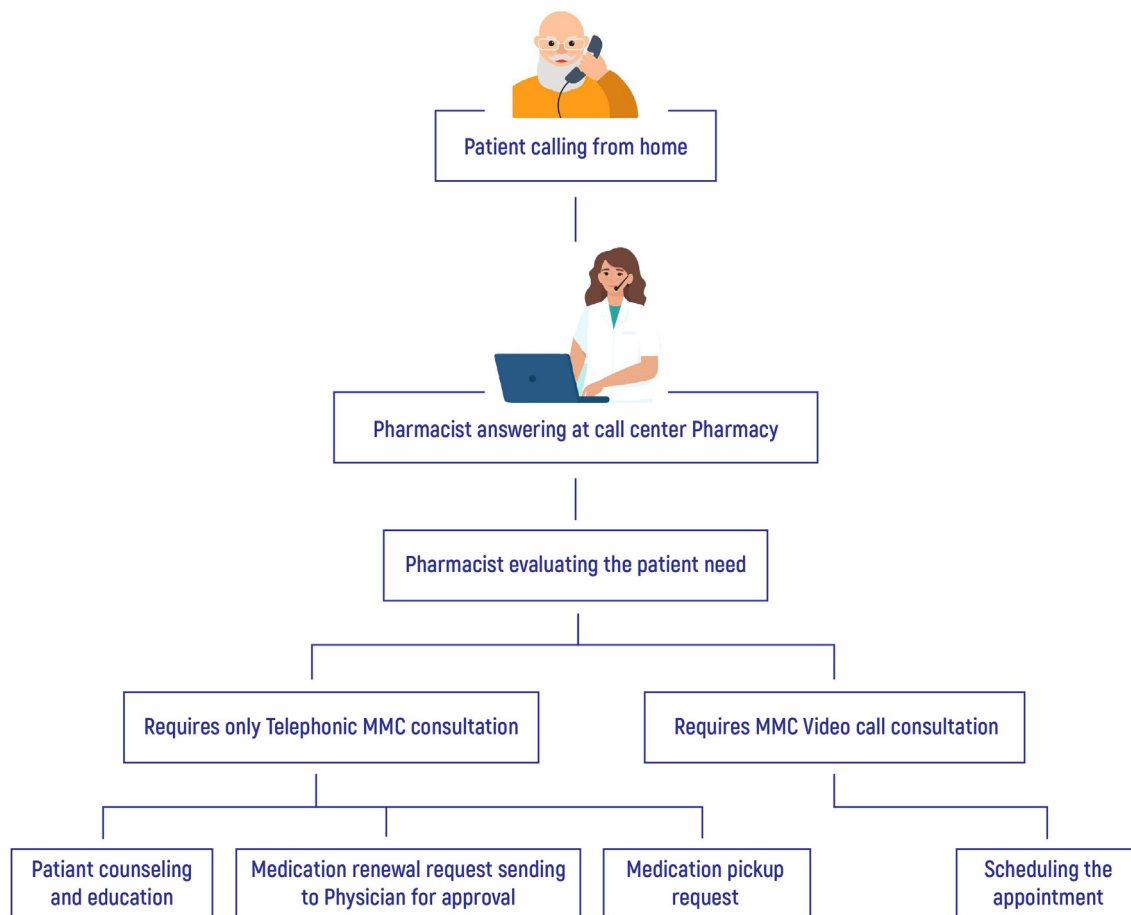


Fig. 2. Flow chart of the telephonic medication management clinic (MMC) consultation process.

unnecessary medication. It also enhanced medication adherence as the pharmacist was able to monitor lab tests and provide a comprehensive medication chart review during the patient encounters. Therefore, pharmacist-led tele-MMC services will be a good initiative to provide better patient-centered care by creating easily accessible appointments for the patient and minimizing travel. The services of this clinic are not limited to the pandemic period and can be explored more in the future by familiarizing the patients with its scope.

2.4. Challenges and opportunities

Tele-pharmacy is well recognized and implemented in the patient care setting, and thus, pharmacists interact with chronically ill patients to manage medication using virtual audio-video communication technology. The challenges include technical issues, such as weak internet connections, which might affect tele pharmacy video consultation. Owing to cultural restrictions, some female patients might be reluctant to have a face-to-face video consultation, and thus, they have the preference of selecting telephonic consultation. In this scenario, the video consultation mode will be switched to phone consultation as per patient preference. These video consultation challenges can be overcome by utilizing the opportunities of telephonic consultation. Further, the tele-MMC might lack a certain degree of empathy compared to that with face-to-face medication consultations. Significant challenges that were encountered included the patient's reluctance to the use of new technology at home. It is the responsibility of the patient-caregiver to assist older patients in using such applications during the tele-pharmacy consultation. Patient education and training might also be required to use new tele-pharmacy tools in their homes effectively. Another challenge faced by pharmacy management is deploying extra staff in tele medication management services during staff shortages.

Tele-pharmacy services play a significant role in the care of discharged patients as they can have a consultation regarding medication used at home after discharge. Policymakers need to mandate tele pharmacy consultations for discharged patients to enhance the scope of clinical pharmacy services for chronically ill patients. The necessary medication monitoring can be performed by tele-pharmacy consultation, such as lab monitoring and advice on follow-up with a physician. This requires specific disease management protocols, like those for diabetes, hypertension, heart failure, and asthma, utilizing tele-pharmacy tools for patient care.

3. Conclusion

JHAH successfully launched an integrated telehealth model, based on pharmacist-led medication management services. The implementation of this model demonstrated a significant improvement in the clinical outcomes of patients and might help to improve the overall satisfaction during and after the peak pandemic period. The integration of the telehealth framework with a pharmacist-led medication management clinic was associated with promising outcomes in the access to and continuity of patient care during health care disruptions and the maintenance of pandemic regulations. The JHAH telehealth model incorporation into medication management clinic could fulfill the provision of pharmaceutical care for eligible patients to facilitate their access to care, improve medication adherence, and manage polypharmacy-related issues. It is advisable for other healthcare institutions to implement a telehealth model of pharmacist-led medication management services, especially during this pandemic, to maintain active care for chronic patients. Thus, the scope of this patient-centered care model will have a definite role in advancing healthcare practice beyond the pandemic to better serve chronic and geriatric patients by

helping them stay at home. Future studies are warranted to explore the effectiveness of incorporating such telehealth models in pharmacy practice.

Declaration of Competing Interest

All authors declared no competing interests.

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