

Original Research Article
Family Medicine

Impact of Virtual Discharge Counselling Services in Patients with Cardiovascular Diseases at Single Cardiac Center in Central Saudi Arabia

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Abstract

Background: Effective discharge counselling by pharmacists is crucial to ensuring medication adherence, improving patient satisfaction, and preventing readmissions. Virtual care in its many forms has been viewed as a tool for improving access to health services. With the increasing demand for efficient healthcare delivery, virtual counselling upon discharge has emerged as a potential alternative to face-to-face (conventional) approach. **Objective:** To compare the impact of virtual versus conventional medication counselling on discharge workflow (turnaround time), medication adherence, and patient satisfaction in a cardiac center. **Methods:** A non-randomized controlled pre-post intervention design study was conducted on 120 patients discharged from a cardiac center. Participants were allocated to receive either conventional (n=60) or virtual (n=60) pharmacist counselling upon discharge. Data were collected via structured digital questionnaires using SurveyMonkey®. Turnaround time (TAT) was assessed by calculating the time between prescription order entry through hospital system, till the time of patient leaving the hospital. The Adherence was measured by the adherence in Chronic Diseases Scale (ACDS) questionnaire utilized to collect data regarding patient adherence about their pharmaceutical care plan post discharge. Moreover, satisfaction questionnaire includes questions that assess the satisfaction regarding virtual medication counselling upon discharge was utilized. All were analyzed using descriptive statistics and the Mann-Whitney U test. **Results:** A total of 120 patients were included in the analysis, with 60 patients receiving conventional face-to-face (verbal) counselling and 60 receiving virtual (mobile-based) counselling upon discharge. The primary outcomes assessed were the turnaround time (TAT) in minutes and the medication adherence score (measured as a percentage or proportion out of 1.00). The mean turnaround time (TAT) was significantly lower in the virtual group (148.5 ± 64.9 minutes) compared to the conventional group (200.5 ± 108.3 minutes, p = 0.019). Adherence scores were slightly higher in the virtual group (0.931 ± 0.088 vs. 0.893 ± 0.103), though not statistically significant (p = 0.053). Overall, 73% of patients reported being very satisfied with the counselling service, with no major differences observed between groups. **Conclusion:** Virtual pharmacist counselling upon discharge is a feasible and efficient alternative to traditional counselling methods, offering comparable patient satisfaction and adherence outcomes while significantly reducing discharge turnaround time. Overall results suggest that virtual counselling upon discharge can enhance discharge efficiency and promote better patient engagement. It represents a promising model for enhancing discharge workflows in busy cardiac centers.

Keywords: Virtual counselling, conventional counselling, discharge, adherence, satisfaction, cardiac center, turnaround time (TAT).

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INTRODUCTION

In recent years a new era of information technology (IT) and artificial intelligence (AI) has begun, the integration between health services and IT and AI was increasingly used within and after COVID-19 pandemic [1]. These services will allow safe and remote communication with the patients [1]. Moreover, these services will reduce patient visits as well [1]. There are many ways or styles of virtual health services, such as, voice and video calls, digital messaging, text messaging and secure emails [1]. Out of the 85.5 million virtual contacts covered under the Kaiser Permanente System health plan in the US, 50% were done by phone, 40% through secure messaging and 0.2% video visits [1].

Patient medication counselling (MC) described as “providing medication information orally or in written form to the patients or their representatives or providing proper directions of use, advice on side effects, storage, diet and lifestyle modifications” [2]. The provision of appropriate and adequate information by pharmacists could help pharmacists identify and resolve drug therapy problems, engage patients in self-management of diseases, and prevent treatment failure and limit resource wastage [2].

Virtual (MC) lets patients obtain their prescriptions and other pharmaceutical care services without having to go to a pharmacy [3]. It was found to reduce travel costs and save time, both of which are important barriers for patients in rural and faraway areas who need healthcare services, especially the disabled and elderly [3]. Virtual (MC) also helps patients stay on their medicines by making them happier and more confident in the services they receive [3]. In addition, it has made pharmacists' clinical roles more effective by giving them enough time for drug counselling in a more private setting [3].

Patient counseling is a vital factor in maximizing the proper use of medications which are considered an central part in the management and treatment of cardiovascular diseases. Virtual care in its many forms has been viewed as a tool for improving access to health services and it is also seen as a way to meet rising demands on healthcare system and possibly reduce healthcare costs. The utilization of virtual counselling has become an progressively common approach for giving counselling and educations. In the United States, this was initiated as early as year 2000 to provide medication counselling to residents in rural area. Virtual counselling saved more than USD 300,000, detected more than 600 medication-related problems over a 6–9-month period and enhanced patients' accessibility to pharmaceutical care.

A study was done indicates that hospital pharmacists in Saudi Arabia have a good understanding and generally positive perceptions of telepharmacy [3]. However, their readiness for its implementation varies,

with significant barriers such as lack of training and technological infrastructure [3]. To successfully implement telepharmacy, there is a need for targeted educational programs, investment in technology, and the development of clear regulatory guidelines. Addressing these factors can enhance the readiness and ability of pharmacists to integrate telepharmacy into their practice, ultimately improving patient care and access to pharmaceutical services [3].

Another study assessed whether telephonic counseling by pharmacists could enhance inhaler adherence among veterans with COPD [4]. Conducted by the University of Wisconsin-Madison and the William S. Middleton Memorial Veterans Hospital, the study involved 97 veterans with a medication possession ratio below 80%. Participants were randomized into two groups: an intervention group receiving telephonic counseling and a control group receiving standard care [4]. The intervention included education on COPD medications, inhaler technique reviews, and motivational interviewing [4]. Over six months, adherence was measured using pharmacy refill records and self-reports. The intervention group showed improved adherence compared to the control group, indicating telepharmacy's potential to enhance medication adherence in COPD patients.

Another study evaluated the impact of telepharmacy on medication dispensing errors (MDEs) and patient counseling during the COVID-19 pandemic [5]. Conducted in 52 community pharmacies in the UAE, it compared 26 telepharmacy-enabled pharmacies with 26 standard ones over four months [5]. Telepharmacy significantly reduced MDEs from 19.43% to 15.81% and prescription-related errors from 10.08% to 5.38% [5]. However, there was no significant difference in pharmacist counseling errors [5]. This study underscores telepharmacy's role in improving pharmaceutical care and reducing dispensing errors during the pandemic [5].

The North Dakota Telepharmacy Project demonstrates that remote community telepharmacies do not have higher medication error rates compared to traditional community pharmacies [6]. Both models showed comparable safety profiles in medication dispensing [6]. The use of advanced technologies and remote pharmacist oversight in telepharmacies helps maintain safe dispensing practices [6]. This evidence supports the viability of telepharmacy as a safe and effective means of providing pharmaceutical care in remote and underserved areas [6]. Future research should continue to monitor medication safety in telepharmacy settings and explore further improvements in telepharmacy practice [6].

Another study found that virtual medication therapy management (MTM) represents a pivotal development in the pharmacy profession, offering significant benefits in terms of patient outcomes,

pharmacist roles, and healthcare delivery [7]. Despite challenges related to technology and implementation, virtual MTM is poised to become a cornerstone of modern pharmacy practice [7]. By embracing virtual MTM, pharmacies can enhance their clinical services, improve patient care, and contribute to the broader healthcare system's shift towards digital and integrated care models [7]. Continued investment in technology, training, and supportive policies is essential to fully realize the potential of virtual MTM and drive the pharmacy renaissance [7].

Another study was done in Malaysia during COVID-19 finds that Interactive virtual medication counselling (IVMC) in outpatient pharmacies during the COVID-19 pandemic proved to be an accessible, safe, and effective method for patient counselling [8]. It maintained high levels of patient satisfaction and quality of information delivery, despite some technological barriers [8]. IVMC offers a viable alternative to in-person counselling, particularly in scenarios where physical visits are challenging or risky. The successful implementation of IVMC during the pandemic highlights its potential for continued use in enhancing patient care and accessibility in the post-pandemic era [8]. Future efforts should focus on addressing technological barriers and optimizing virtual counselling methods to further improve patient outcomes [8].

Another study showed that combining electronic (virtual) monitoring with regular counseling is an effective strategy to improve medication adherence [9]. This approach leverages technology to provide real-time tracking and reminders, while counseling addresses individual barriers and provides personalized support. Improved adherence leads to better clinical outcomes and higher patient satisfaction [9]. Future efforts should focus on addressing technological barriers and optimizing the frequency and quality of counseling to maximize the benefits of this intervention [9]. Moreover, this study found a high level of patient satisfaction with the services, patients appreciated the convenience of electronic monitoring and the personalized approach of virtual counselling sessions [9]. However, there were some challenges, such as, some patients faced technological barriers, such as difficulty using electronic devices or lack of access to necessary technology, and the success of the intervention was partly dependent on the frequency and quality of counselling sessions [9].

One study examines the use of telehealth (medication virtual counselling) for providing counseling to patients receiving medications for opioid use disorder during the COVID-19 pandemic, focusing on innovations, effectiveness, and challenges [10]. They have done surveys and interviews with patients and healthcare providers to gather feedback on telehealth experiences, and they have done an analysis of counselling session frequency, patient engagement, and treatment adherence [10]. They evaluate the

technological issues and access barriers [10]. This study finds that telehealth innovations have played a crucial role in ensuring the provision of counseling to patients receiving medications for opioid use disorder during the COVID-19 pandemic [10]. While telehealth offers increased accessibility and convenience, it also presents challenges such as technological barriers and concerns about the quality of care [10]. Addressing these challenges through improved training, support, and technological infrastructure can enhance the effectiveness of telehealth for OUD treatment [10]. Continued evaluation and adaptation of telehealth practices are essential to optimize patient care and support in the evolving healthcare landscape [10].

Another study investigates the barriers and negative experiences encountered by patients receiving telephone counseling as part of their pharmaceutical plan for opioid use disorders [11]. Telephone counseling offers a means to maintain continuity of care for patients receiving medication for opioid use disorders, it is fraught with significant barriers and challenges [11]. Communication issues, technical difficulties, and the lack of personal connection and privacy negatively impact patient experiences and the effectiveness of counseling sessions [11]. Addressing these barriers requires improvements in technology, training for counselors to enhance phone communication skills, and strategies to ensure patient privacy and engagement [11]. Exploring alternative telehealth methods, such as video counseling, may offer a more effective solution for supporting patients in their treatment [11].

Another study was done at Pharmacy Services Department, Johns Hopkins Aramco Healthcare (JHAH), Saudi Arabia, the study examines the implementation and effectiveness of a pharmacist-led tele medication management clinic in ambulatory care settings during the COVID-19 pandemic, focusing on patient-centered care, medication management, and health outcomes [12]. They found the implementation of a pharmacist-led tele medication management clinic in ambulatory care settings during the COVID-19 era demonstrated significant benefits in medication adherence, therapy optimization, and patient satisfaction [12]. The patient-centered care model provided convenient and effective medication management, leading to improved health outcomes and reduced adverse drug events [12]. Addressing technological barriers and ensuring adequate training and resources are crucial for the sustainability and success of telehealth initiatives [12]. This model has the potential to enhance healthcare delivery and patient care beyond the pandemic, offering a viable solution for ongoing medication management in ambulatory settings [12].

Overall, virtual discharge counseling has become increasingly relevant with the rise of telemedicine, offering flexibility and continuity of care for patients with cardiovascular diseases (CVDs). While

this approach has shown promise in various medical domains, there is limited evidence specifically focused on its application in cardiac patients. Current literature primarily addresses chronic disease management or general telehealth applications, leaving a gap regarding the impact of virtual counseling on discharge-related outcomes, such as patient adherence, turnaround time and efficiency of care transitions.

Objectives:

1. To evaluate the effectiveness of discharge virtual counselling services (intervention) on patient's adherence to their pharmaceutical care plan in comparison to conventional 'face-to-face' counselling approach.
2. To evaluate the impact of virtual counselling services (intervention) on discharge turnaround time (TAT).
3. To assess patient satisfaction toward virtual counselling service.

METHODS

Study Design: This study utilized a non-randomized controlled pre-post intervention design.

Sample Size: A purposive sample of 120 Patients.

Study Period: Data was collected during the period from 1st July 2024 to 31st August 2025.

Study Population

The study population includes:

- All discharged adult patients (males and females) with cardiovascular disease.
- Age More than or equal 18 years old.
- Discharged patients with ≤ 8 items/medications.

Exclusion Criteria:

- Age less than 18 years old.
- Elderly patients who do not have a caregiver or patient who are unable to communicate remotely.

Data Collection

- Data collection sheet was designed to collect all relevant information from the EHR system, including demographic information (age, sex, race, and ethnicity).
- Patient adherence data were collected from an adherence in chronic diseases scale (ACDS) general survey that assess patient adherence to his pharmaceutical plan, data were collected from a validated survey that assess patient adherence, it was an online self-administered questionnaire/scale developed and distributed through SurveyMonkey®.
- Data for patient satisfaction about virtual counselling services were collected from a validated survey that assess satisfaction, it was

an online self-administered questionnaire developed and distributed through SurveyMonkey®.

1) Evaluation of the effectiveness of discharge virtual counselling services(intervention) on patient's adherence to their pharmaceutical care plan in comparison to conventional face-to-face counselling approach (control).

- The adherence in chronic diseases scale (ACDS) questionnaire (full adherence survey (scale) was utilized to collect data regarding patient adherence about their pharmaceutical care plan post discharge.
- The ACDS is a 7-item questionnaire. Each question is associated with 5 predefined propositions of answers. The questions are related to patients' behaviour directly determining adherence (items 1-5) or to situations and opinions which may influence adherence (items 6-7). The ACDS is dedicated to adherence evaluation in adult patients treated due to chronic diseases. This scale is supposed to reflect real-life adherence to pharmacological treatment and explain mechanisms determining patient's adherence. The results of this scale may help to undertake adequate actions aimed to improve adherence to medication in clinical practice.
- The questionnaire delivered to patients who have been counselled virtually (intervention) through WhatsApp/phone and those who received conventional face to face approach (Control).

2) Evaluation of the impact of virtual counselling services on discharge turnaround time.

- A turnaround time was assessed by calculating the time between prescription order entry through CERNER system, till the time of patient leaving the hospital, real discharge time will be taken from nurse's records. Moreover, this calculated time (intervention) compared to turnaround time during conventional (control) counselling.

3) Assessment of patient satisfaction toward virtual counselling service.

- An assessment of patient satisfaction following pharmacist counselling session using a novel questionnaire in (full satisfaction survey (scale).
- Questionnaire utilized to collect data regarding patient and health care practitioners (physicians, pharmacists and nurses) satisfaction about virtual medication counselling.
- The questionnaire include questions that assess the satisfaction regarding virtual medication counselling.

- The questionnaire delivered to patients who have been counselled virtually (intervention) through WhatsApp/phone.

Statistical Analysis

The data was analyzed using The Statistical Package for the Social Sciences (SPSS). Frequencies and percentages will represent categorical variables. The mean and standard deviation will define continuous variables.

Table 1: Patient Characteristics: Gender Distribution

Gender	Conventional (n=59)	Virtual (n=60)	Total (n=119)
Male	41 (69.5%)	34 (56.7%)	75 (63.0%)
Female	18 (30.5%)	25 (41.7%)	43 (36.1%)

1. Turnaround Time (TAT)

The mean turnaround time was significantly lower in the virtual group compared to the conventional group.

- Conventional: 200.5 ± 108.3 minutes
- Virtual: 148.5 ± 64.9 minutes

A Mann–Whitney U test indicated a statistically significant difference in TAT between the two groups ($p = 0.019$), as shown in figure 1 and table 2.

RESULT

A total of 120 patients were included in the analysis, with 60 patients receiving conventional face-to-face (verbal) counselling and 60 receiving virtual (mobile-based) counselling upon discharge. The primary outcomes assessed were the turnaround time (TAT) in minutes and the medication adherence score (measured as a percentage or proportion out of 1.00).

2. Adherence Score

The mean adherence score was slightly higher in the virtual group:

- Conventional: 0.893 ± 0.103
- Virtual: 0.931 ± 0.088

However, the difference was not statistically significant (Mann–Whitney U test, $p = 0.053$), as shown in figure 2 and table 3, 4.

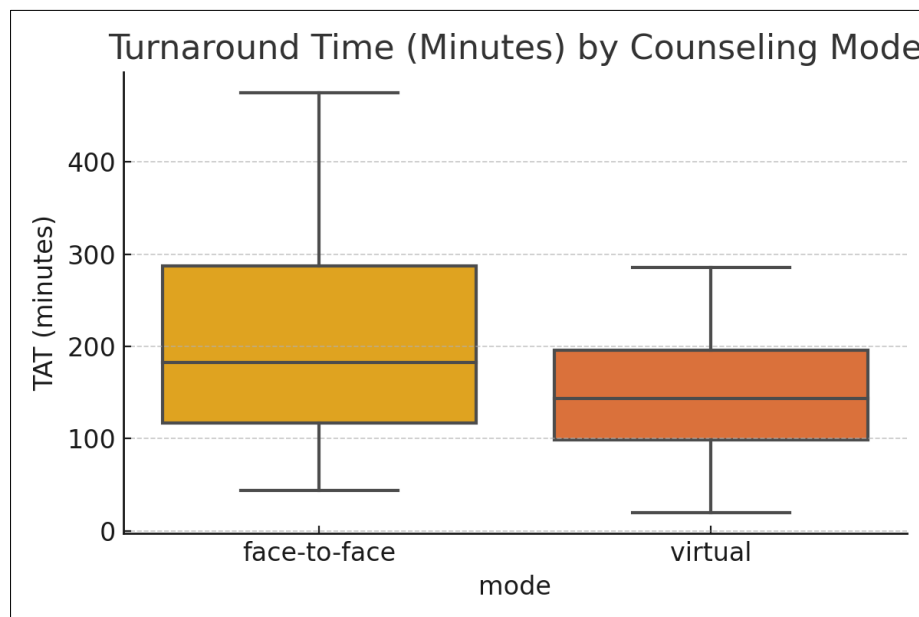


Figure 1: Illustrates the distribution of turnaround time by counseling mode

Table 2: Descriptive Statistics: Turnaround Time

Group	Mean	Median	SD	Min	Max
Conventional	200.5	183	108.3	44	475
Virtual	148.5	144	64.9	20	286

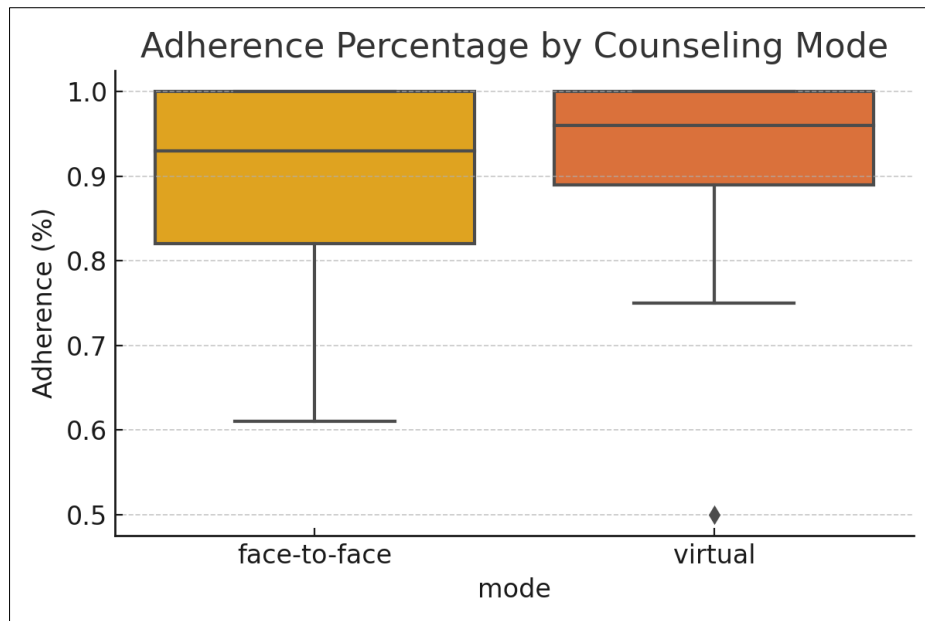


Figure 2: Displays the adherence score distribution across both groups

Table 3: Turnaround Time and Adherence Summary

Outcome	Conventional (Mean ± SD)	Virtual (Mean ± SD)	p-value
Turnaround Time (min)	200.5 ± 108.3	148.5 ± 64.9	0.019
Adherence Score (0–1)	0.893 ± 0.103	0.931 ± 0.088	0.053

Table 4: Descriptive Statistics: Adherence Score

Group	Mean	Median	SD	Min	Max
Face-to-Face	0.893	0.93	0.103	0.61	1.00
Virtual	0.931	0.96	0.088	0.50	1.00

3. Service Satisfaction (Virtual Counseling Only)

A total of 53 patients completed the satisfaction survey following virtual pharmacist counselling upon discharge. All respondents (100%) reported being able to access the counseling service without difficulty. The majority reported receiving the knowledge they were seeking (100%) and found the pharmacist helpful (96.2%). In terms of time satisfaction, 86.8% felt the

time given was appropriate, while only 13.2% felt more time was needed. Notably, 98.1% indicated they would recommend pharmacist counseling to others, and 96.2% agreed this service should be offered in community pharmacies. (see table 5) Full response distributions for individual satisfaction questions are provided in Appendix B.

Table 5: Summary of Key Satisfaction Questions (n=53)

Item	Most Common Response	Count	Percentage
Accessed counseling easily	Yes	53	100.0%
Gained needed knowledge	Yes completely	53	100.0%
Pharmacist helpful	Very helpful	51	96.2%
Counseling time was appropriate	Appropriate time was given	46	86.8%
Would recommend service	Yes	52	98.1%
Service should be available in pharmacies	Yes	51	96.2%

Moreover, the 60 patients who received virtual counseling, 53 responded to the service satisfaction survey. Overall satisfaction was high, with the majority of participants reporting a positive experience.

- Very satisfied: 73.6% (n = 39)
- Satisfied: 24.5% (n = 13)

- Unsatisfied: 1.9% (n = 1)

The average satisfaction rating on a 10-point scale was 9.34 ± 0.83 , indicating a high level of perceived service quality. Figure 3 and Table 6 summarize the distribution of satisfaction levels among respondents.

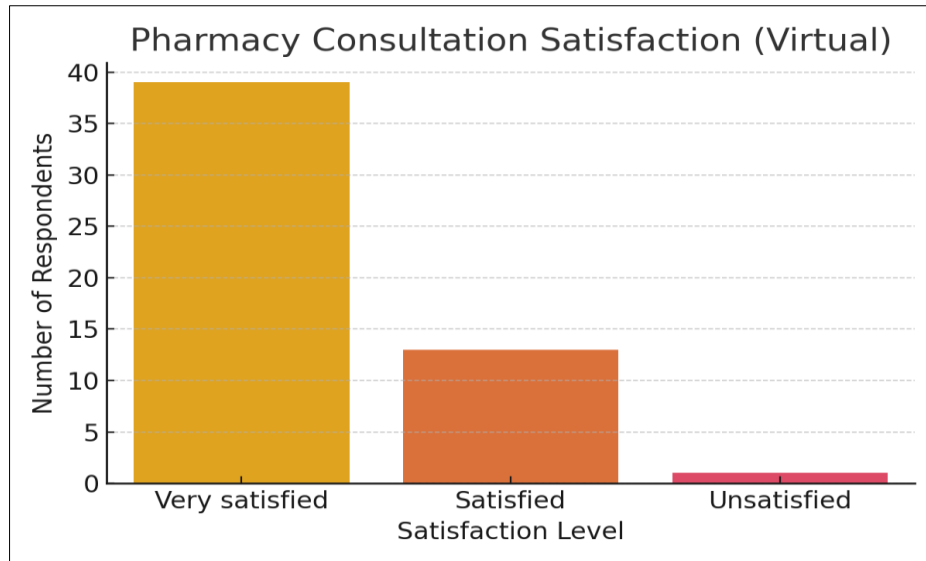


Table 6: Patient Satisfaction (Virtual Group Only)

Satisfaction Level	Number	Percentage
Very Satisfied	39	73.6%
Satisfied	13	24.5%
Unsatisfied	1	1.9%

DISCUSSION

This study highlights the efficiency and acceptability of virtual pharmacist counselling upon discharge compared to conventional counselling, and the impact of virtual pharmacist counseling on discharge workflow, medication adherence, and patient satisfaction in a cardiac center. The findings highlight both the potential benefits and challenges of implementing this approach.

The average turnaround time (TAT) was significantly shorter in the virtual group (mean = 148.5 min, SD $\pm$ 64.9) than in the verbal group (mean = 200.5 min, SD $\pm$ 108.3), demonstrating the time-saving benefits of remote counseling. These results align with findings a study from General Hospital in Moose Factory, Ontario about a telepharmacy model of care for hospitals, who reported enhanced service timeliness through telepharmacy in rural settings [14].

Regarding medication adherence, scores were slightly higher in the virtual group (mean = 0.931, SD $\pm$ 0.088) compared to the conventional group (mean = 0.893, SD $\pm$ 0.103), although this difference did not reach statistical significance (p = 0.053). This trend is consistent with prior research demonstrating that telepharmacy achieves similar or occasionally better adherence outcomes compared to traditional models.

Satisfaction levels were notably high, all respondents (100%) reported easy access and knowledge gain, with 96.2% finding the pharmacist helpful and 98.1% willing to recommend the service. The average satisfaction score of 8.48/10 (SD $\pm$ 0.51) reflects a

strong, consistent positive experience. These results mirror those from a study in Queensland, Australia, where patient satisfaction with telepharmacy exceeded 95%, they evaluated home telehealth monitoring with active medication therapy management by clinical pharmacists in veterans with poorly controlled type 2 diabetes mellitus [15]. Together, these findings suggest virtual pharmacist counseling is a feasible and effective alternative to conventional method. Reduced TAT and high patient satisfaction and acceptance support its integration into discharge planning and routine pharmacy care especially in regions facing limited access or resource constraints.

Moreover, there is a notable lack of research evaluating the implementation of virtual pharmacist counseling specifically in cardiac centers, despite these settings handling high-risk, polypharmacy patients. This gap highlights the novelty and relevance of the current study in contributing to this underserved area.

This study has several strengths. It is among the few local efforts to evaluate virtual pharmacist counseling in a real-world cardiac center setting, with a reasonable sample size and complete data collection using a secure digital tool (SurveyMonkey®).

Clinically, the findings underscore the feasibility and acceptability of virtual pharmacist discharge counseling. With appropriate infrastructure and coordination, this model can reduce time delays, improve medication understanding, and boost adherence, particularly in busy hospital environments or during public health emergencies where face-to-face contact is limited.

However, several operational and clinical factors were identified as contributors to variations in discharge turnaround time. First, delays in the preparation and dispensing of the (To Take Out) (TTO) medications can significantly extend discharge time, especially during high volume periods or when medication availability is limited. Second, logistical delays, such as, the porter being late to collect medications from the pharmacy and deliver them to the ward can add further dilemma.

In addition, prescription-related issues, particularly physician prescribing errors, were noted to be common causes of delay. These may include missed items, incorrect doses, or inappropriate medications, which necessitate re-checking and modifications before final approval. Such issues are often identified at the last minute, sometimes requiring cancellation or addition of new medications. These steps introduce unplanned delays that affect both pharmacist workflow and patient discharge timing.

One important operational factor observed during the study was the variation in discharge processes depending on the patient's admission setting, specifically, whether the patient was managed in the catheterization laboratory (CathLab) as a day case or in the adult inpatient wards. Patients admitted to the CathLab typically experienced shorter discharge turnaround times. This is largely attributed to the procedural nature of CathLab admissions, the structured workflow, and the prioritization of rapid bed turnover to accommodate the high volume of procedures.

This variation may have influenced the study's findings related to discharge turnaround time. If a higher number of patients receiving virtual counseling were discharged from the cathlab, it could introduce a confounding factor suggesting faster discharge due to the care setting rather than the counseling method itself. Hence, the discharge location should be considered when interpreting the results.

However, this operational dynamic also highlights a practical advantage of implementing virtual discharge counseling. In high-turnover areas like the CathLab, virtual counseling can facilitate quicker patient processing by reducing the dependency on physical presence of pharmacists or clinicians. This can facilitate discharge workflows, improve bed utilization, and enhance overall hospital efficiency. Therefore, beyond its clinical impact, virtual counseling holds significant operational value.

To enhance the integration and sustainability of virtual discharge counseling services in our center, future planning should consider two practical strategies. First, allocating three to four dedicated phone lines to pharmacists assigned full-time to discharge counseling could ensure timely and consistent communication with

all patients being discharged. This approach would facilitate operations, reduce delays, and support better coverage for both CathLab and inpatient units/wards.

Alternatively, a more sustainable solution would involve developing a comprehensive digital platform specifically designed for discharged patients. Such a system should integrate both clinical and technical components, allowing pharmacists to document interventions, schedule counseling sessions, and communicate securely with patients. By combining clinical workflows with digital infrastructure, the platform could improve efficiency, ensure traceability and documentation, and provide data for future quality improvement.

To optimize the safety and effectiveness of virtual discharge counseling, it is essential to strengthen communication between the counseling pharmacist, the prescribing physician, and the patient's primary nurse. Clear and timely communication channels can help address last-minute changes in medication orders, clarify any discrepancies, and promptly resolve issues such as cancellations or prescribing errors. This interdisciplinary collaboration is critical to ensure accurate information delivery, enhance patient safety, and ultimately improve overall outcomes after discharge.

In conclusion, this study supports the integration of virtual pharmacist counselling into hospital discharge processes, demonstrating positive outcomes in patient satisfaction and adherence. Addressing the logistical and technical barriers identified may enhance the effectiveness and scalability of this approach. Future research should explore its long-term impact on clinical outcomes.

CONCLUSION

This study demonstrated that virtual pharmacist counseling is a feasible and effective model for supporting patient discharge in a cardiac center. The findings showed a significant reduction in turnaround time, high patient satisfaction, and a positive trend in medication adherence among patients who received virtual counseling. Although some logistical challenges were encountered, the overall results suggest that virtual counseling can enhance discharge efficiency and promote better patient engagement.

Future large-scale studies are recommended to validate these findings and assess long-term clinical outcomes, including readmission rates and medication persistence.

Ethical Considerations

This study, titled (Impact of Virtual Discharge Counselling Services in Patients with Cardiovascular Diseases at a Single Cardiac in Central Saudi Arabia) was approved by the Institutional Review Board (IRB)

of [Prince Sultan Military Medical City], Saudi Arabia (IRB Approval No. C-0010, approved on 22 May 2025).

Utilization

The study determined whether the result of virtual medication counseling for discharged patients at PSCC has a positive impact in patient compliance and satisfaction, and whether satisfy practitioners, and reduce turnaround time compared with conventional medication counseling.

Although, little is known about the effectiveness of virtual counseling services in patients with cardiovascular diseases. We believe that studying the effectiveness of virtual counseling and its impact on patient's compliance, staff satisfaction and discharge workflow would result in a positive value to the pharmacy practice.

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